ICCIDSDT 2026

International Conference
on Computational Intelligence,
Data Science, and Digital Transformations

15th & 16th January - 2026

SOUVENIR



Organized by

Department of Computer Science and Information Technology
Maulana Azad National Urdu University,
Gachibowli, Hyderabad, India.

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International Conference

on

Computational Intelligence, Data Science, and Digital Transformations

(ICCIDSDT-2026)

January 15th & 16th, 2026

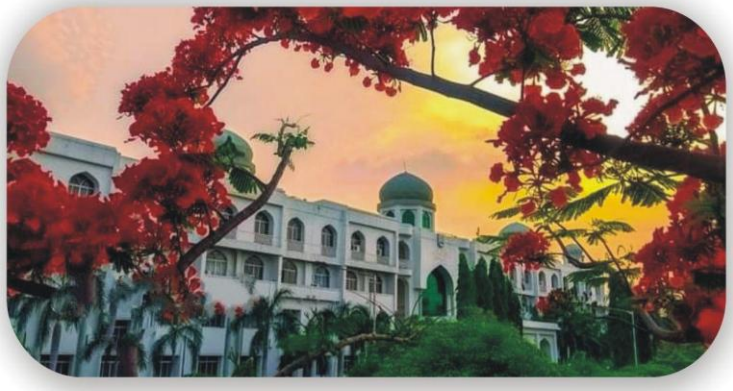
SOUVENIR

Organized by

Department of Computer Science and Information Technology,
School of Technology,
Maulana Azad National Urdu University, Hyderabad, India.

The Iconic Admin Building

M A N U U



Department of CS & IT



Block - 1



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PREFACE

The International Conference on Computational Intelligence, Data Science, and Digital Transformations (ICCIDSDT-2026) is envisioned as a global forum to bring together researchers, academicians, industry professionals, and practitioners to exchange ideas and discuss recent advancements in the fields of computational intelligence, data science, and emerging digital technologies.

ICCIDSDT-2026 aims to promote interdisciplinary research and foster collaboration among participants from academia and industry. The conference covers a broad spectrum of themes including artificial intelligence, machine learning, data analytics, and digital transformation across various domains.

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MESSAGES FROM DIGNITARIES

मौलाना आज़ाद नेशनल उर्दू यूनिवर्सिटी مولانا آزاد نیشنل اُردو یونیورسٹی
MAULANA AZAD NATIONAL URDU UNIVERSITY
A Central University under Ministry of Education
Government of India

प्रो. सय्यद ऐनुल हसन, कुलपति
پروفیسر سید عین الحسن، شیخ الجامعہ
Prof. Syed Ainul Hasan, Vice-Chancellor



From the Vice Chancellor's Desk

On behalf of Maulana Azad National Urdu University, it gives me great pleasure to welcome all delegates, keynote speakers, researchers, academicians, industry professionals, and students to ICCIDSDT 2026, organised by the Department of Computer Science & Information Technology.

The current time requires ICCIDSDT conferences to become more important because technology now controls all social and governmental systems. The platform lets users talk about modern issues while they show their research results and discover innovative solutions which unite artistic methods with social worth and accessible design for everyone. The conference will reach its objective through its technical sessions which will show research results and help academics build effective research collaborations.

The University dedicates itself to building an active research environment which supports outstanding educational programs and creative work and cross-disciplinary academic programs. The university supports this commitment through its decision to host ICCIDSDT 2026 because knowledge development succeeds best when institutions and nations and regions work together to share their knowledge. The conference needs to create new concepts which will help experts build improved connections while encouraging young researchers to conduct vital studies based on ethical standards.

The conference success depends on the dedicated work of the organizing committee and faculty members and reviewers and volunteers and administrative teams who provided their support. Their contribution plays an essential role in creating a well-organized and expertly managed event.

I convey my best wishes for the grand success of ICCIDSDT 2026. Your involvement should result in academic growth and professional development and create lasting personal experiences. I also wish all our guests a pleasant stay in Hyderabad and a warm experience at Maulana Azad National Urdu University.

Prof. Syed Ainul Hasan

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"है कौन विघ्न ऐसा जग में, टिक सके वीर नर के मग में? खम ठोंक ठेलता है जब नर, पर्वत के जाते पाँव उखड़।"

Prof. R.S. Nirjar
Former Chairman, AICTE
Founder Vice-Chancellor, Gautam Buddha University



It gives me immense pleasure to know about the *International Conference on Computational Intelligence, Data Science, and Digital Transformations* that is being organized at the *Department of Computer Science & Information Technology, Maulana Azad National Urdu University, Hyderabad.* Conferences such as ICCIDSDT-2026 are meaningful platforms for reflection, dialogue and mutual learning. A souvenir is a subtle reminder of our shared intellectual journey and the future directions we aspire to take.

Throughout my journey, I have been frequently assigned responsibilities during periods of challenges arising from institutional transitions. This journey and the experiences it has brought have taught me that difficulties are not to be feared. In fact, challenges are opportunities that develop character, strengthen systems, and clarify purpose. When we approach challenging situations with integrity and patience, they become opportunities to grow.

We live in a time of abundant knowledge. There are countless books, papers, and digital resources around us. Nevertheless, true learning has nothing to do with the collection of resources but with thoughtful reading and deep understanding. While the world is full of books, the world is often short on readers who truly listen to the page. When we choose to read with reflection, we do more than just learn; we build a sense of clarity and discipline that stays with us.

I would like to offer a simple message of encouragement to the young minds participating in this conference: do not fear complex problems, and do not rush through ideas. Read keenly, think independently, and be committed to excellence and ethical values. Make meaningful contributions to society and the nation through quiet and sincere effort.

I commend the organizers for their dedication and vision in organising this conference. I extend my heartfelt blessings and best wishes to all the participants for fruitful discussions, personal growth, and continued success in their academic and professional journeys.

With deep affection and blessings.

Best wishes & Blessings

RS Nirjar 08.01.26

Prof. R. S. Nirjar

विद्या ददाति विनयं, विनयाद् याति पात्रताम्।

मौलाना आज़ाद नेशनल उर्दू यूनिवर्सिटी مولانا آزاد نیشنل اُردو یونیورسٹی
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Government of India

Prof. Abdul Wahid
Dean, School of Technology

From the Dean School of Technology's desk



As Dean of the School of Technology, I am pleased to welcome you to the International Conference on Computational Intelligence, Data Science, and Digital Transformations (ICCIDSDT 2026). This event marks a significant milestone for our Department of Computer Science & Information Technology as we explore the technologies that are currently reshaping our world.

The focus of this conference is on significant advancements in Artificial Intelligence, Big Data, and Digital Transformation. These fields are no longer merely theoretical; they are practical tools that drive modern industry and innovation. Our goal for this conference is to provide a professional environment where experts can present their findings, challenge existing methods, and collaborate on new research directions.

The School of Technology is committed to fostering an environment where academic rigour meets practical application. By hosting ICCIDSDT 2026, we aim to bridge the gap between global research trends and local academic excellence. I encourage all participants to make full use of the technical sessions and the opportunity to network with peers from around the world. I look forward to the high-quality research that will be presented and wish everyone a successful and enriching conference.

Prof. Abdul Wahid

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Dr. Santosh Kumar Pandey
Additional Director/ Scientist 'E'

सत्यमेव जयते

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अ० स० पत्र सं०
D.O.No. 3(27)/2025-DigiGov

दिनांक / Dated December 31, 2025



Message

It gives me immense pleasure to note that the **International Conference on Computational Intelligence, Data Science and Digital Transformations (ICCIDSDT-2026)** is being organized on **January 15–16, 2026**, bringing together academics, researchers, industry experts, and students on a common platform.

Such conferences provide an appropriate forum to exchange knowledge, share research findings, and deliberate on emerging trends in computing and digital technologies. They offer a unique opportunity for researchers and practitioners to showcase their innovative ideas, while encouraging students to go beyond the classroom and engage with the latest developments in science and technology.

At this crucial juncture, when digital transformation, data-driven decision-making, and emerging technologies are reshaping governance, industry, and society, it is imperative that academic institutions and research communities come forward with innovative and impactful research outcomes. Conferences such as ICCIDSDT-2026 act as a catalyst in presenting such outcomes, which may further evolve into high-quality publications and real-world applications.

I am confident that ICCIDSDT-2026 will be enriched with insightful deliberations, innovative research papers, and meaningful interactions, contributing significantly to the advancement of computing, data science, and digital technologies.

I extend my best wishes to the organizing committee, faculty members, researchers, and students for the successful conduct of the said conference and for all their future endeavours.

31 12 2025

(Dr. Santosh K Pandey)

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प्रो.एसके. इश्तियाक़ अहमद, कुलसचिव
پروفیسر ایس کے اشتیاق احمد، رجسٹرار
Prof. Sk. Ishtiaque Ahmed, Registrar



Message from the Registrar

On behalf of Maulana Azad National Urdu University, I am pleased to welcome all delegates, speakers, and participants to ICCIDSDT 2026, being organised by the Department of Computer Science & Information Technology.

It is a privilege for the University to host this international conference. The ICCIDSDT platform unites experts who study emerging technologies through research and practice to share their views while showing new studies and conducting dialogues which determine the path of technological progress and innovation development. The events create opportunities for academics to build professional relationships which lead to ongoing research partnerships that continue after the conference period.

The success of this conference depends on continuous work which people need to perform in the background. I want to thank the Department of Computer Science & Information Technology and the organizing committee and administrative staff who dedicated themselves to plan and execute this event through their combined efforts.

The University backs every initiative which promotes research development and enables international academic relationships and intellectual knowledge sharing. The organization continues to support academic events because these activities generate essential value which supports educational development and intellectual exploration and institutional expansion.

I wish ICCIDSDT 2026 every success and hope that all participants find the sessions engaging and the interactions professionally enriching. The University welcomes you to stay comfortably while you experience an unforgettable time at the institution.

Prof. Sk. Ishtiaque Ahmed

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Pusat Keselamatan Siber dan Revolusi Industri Digital
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Ts. Syarifah Bahiyah Rahayu, PhD
Director, Cyber Security and Digital Industrial Revolution Centre
Senior Lecturer, National Defense University of Malaysia

I would like to express my deepest appreciation to the Organizing Committee of ICCIDSDT-2026 for the invitation to serve as a Keynote Speaker. ICCIDSDT-2026, organized by the Department of CS & IT, Maulana Azad National Urdu University (MANUU) in Hyderabad and scheduled to be held in hybrid mode on 15–16 January 2026, is an important platform to explore Computational Intelligence, Data Science, and Digital Transformations.

UPNM is truly honoured to collaborate and co-host this prestigious international conference with MANUU. Through this partnership, we aim to contribute to the academic and technological agenda, in line with UPNM's aspiration to produce disciplined, ethical leaders who can adapt to the digital era.

The theme of this conference, which emphasizes dynamism and innovation in the landscape of computational intelligence and digital transformation, clearly reflects the direction of future technology. This two-day program offers valuable opportunities through paper presentations, keynote addresses, expert panels, and interactive sessions, fostering interdisciplinary connections and professional networking among researchers, academia, and industry.

I sincerely hope ICCIDSDT-2026 will be a resounding success, with broad participation, impactful scholarly outcomes, and productive dialogues that drive solutions to real-world challenges in this field. May it serve as a platform for inspiration, exchange of ideas, and constructive collaboration grounded in science, innovation, and digital revolution.

Warm regards and best wishes for ICCIDSDT-2026.

Ts. Syarifah Bahiyah Rahayu

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Government of India

Prof Pradeep Kumar
Head, Department of Computer Science & Information Technology

January 6, 2026



I am delighted to extend a warm welcome to all the delegates, researchers, academicians, industry experts, and students participating in the International Conference on Computational Intelligence, Data Science and Digital Transformation (ICCIDSDT-2026), scheduled to be held on January 15–16, 2026, at the Department of Computer Science & Information Technology, Maulana Azad National Urdu University (MANUU), Hyderabad.

The rapid advancements in computational intelligence, data science, and digital transformation are redefining the way we understand technology and its impact on society. This conference aims to provide a meaningful platform for sharing knowledge, presenting cutting-edge research, and fostering collaboration among scholars and professionals from diverse backgrounds.

The interdisciplinary focus of the conference encourages thoughtful discussions and the exchange of innovative ideas that can address contemporary challenges in computing, engineering, and digital systems. Through keynote addresses, technical sessions, and interactive engagements, the conference aspires to inspire new perspectives and promote research excellence.

I sincerely commend the efforts of the organizing committee, reviewers, speakers, and contributors for their dedication and hard work in bringing this conference together. I also extend my appreciation to all participants for their valuable contributions and enthusiastic involvement.

I am confident that this conference will be an intellectually rewarding experience and will contribute significantly to academic growth and collaborative research. I wish all the delegates a productive, insightful, and memorable time at MANUU, Hyderabad.

Prof. Pradeep Kumar
Director, ICCIDSDT - 2026

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Mr. Mohatesham Pasha Quadri
Assistant Professor,
Department of CS & IT, MANUU

Message from the Convener



It gives me immense pleasure to welcome you to the International Conference on Computational Intelligence, Data Science, and Digital Transformations (ICCIDSDT 2026), which will be held on 15th & 16th January 2026 at the Department of Computer Science & Information Technology, Maulana Azad National Urdu University, Hyderabad, India.

This two-day International conference aims to explore the dynamic shifts and innovations shaping the future of Computational Intelligence, Data Science, and Digital Transformations. It brings together national and international researchers, academicians, and Industry leaders for an engaging exchange of ideas through paper presentation, Keynote speeches, and interactive sessions. Creating a collaborative platform for innovation, networking, and knowledge exchange across Interdisciplinary domains.

I am grateful to our distinguished speakers, reviewers, and all committee members, whose dedication and expertise have made this event possible. I also extend my sincere appreciation to the colleagues and student volunteers of the Department of CS & IT, MANUU, for their efforts in ensuring the success of this conference.

Hyderabad, known for its academic vibrancy and technological growth, provides an ideal setting for this international gathering. I am confident that ICCIDSDT-2026 will provide all participants with a rewarding experience, filled with learning, networking, and new opportunities for collaboration.

I warmly welcome you to MANUU for the two-day International Conference ICCIDSDT-2026. Let us come together to shape the future of Digital Transformation.

Mohatesham Pasha Quadri

مولانا آزاد نیشنل اردو یونیورسٹی
Maulana Azad National Urdu University,
گچیبولی، حیدرآباد (500032)، تلنگانہ
Gachibowli, Hyderabad (500032), Telangana,
India Tel: 040-23008367, Website: www.manuu.edu.in

KEYNOTE & INVITED SPEAKER PROFILES

ICCIDSDT 2026

International Conference on Computational Intelligence, Data Science, and Digital Transformations

15th & 16th JANUARY – 2026

KEYNOTE SPEAKER



DR. TS. SYARIFAH BAHIYAH RAHAYU

Director, Cyber Security & DIR Centre
National Defence University of Malaysia

Title:

"Towards Robust Blockchain Systems: Consensus and Learning Synergies"


MAULANA AZAD NATIONAL URDU UNIVERSITY
VYANG SARTHI
UPNM
MINISTRY OF SCIENCE AND TECHNOLOGY
INSTITUTION'S INNOVATION COUNCIL
ICCIDSDT 2026
International Conference on Computational Intelligence, Data Science, and Digital Transformations
15th & 16th JANUARY – 2026
KEYNOTE SPEAKER
DR. VISHNU S. PENDYALA
Department of Applied Data Science
San Jose State University, USA
Title:
"Leveraging AI for Driving the Next Era of Computational Intelligence and Digital Transformation"

ICCIDSDT 2026

International Conference on Computational Intelligence, Data Science, and Digital Transformations

15th & 16th JANUARY – 2026

KEYNOTE SPEAKER



DR. SRINIVAS PENTYALA

Director of Translational Research Faculty in Orthopedics, Urology, Health Sciences, Physiology & Biophysics and Mechanical Engineering

Title:

"Bioinnovation: Computed, Printed and Delivered"

ICCIDSDT 2026

International Conference on Computational Intelligence, Data Science, and Digital Transformations

15th & 16th JANUARY – 2026

KEYNOTE SPEAKER



DR. SANTOSH KUMAR PANDEY

Addl. Director, Ministry of Electronics and Information Technology, Government of India

Title:

""India Digital Rise - From Vision to Impact""

ABOUT UNIVERSITY

Maulana Azad National Urdu University (MANUU) is a Central University established by an Act of Parliament in 1998, with its main campus located at Gachibowli, Hyderabad, Telangana, spread over 200 acres. Named after Maulana Abul Kalam Azad, India's first Education Minister and a distinguished scholar, the University was founded to promote inclusive and quality education, particularly through the medium of Urdu. MANUU offers education from elementary to doctoral levels and has earned an A+ Grade accreditation from NAAC. Through its network of regional and study centres across 11 states in India, the University has expanded access to higher education for diverse learner communities.

MANUU holds a distinctive position in India's higher education landscape as the only central university offering a wide range of programmes through the Urdu language while simultaneously embracing contemporary disciplines and modern teaching practices. The University supports research, interdisciplinary learning, and innovation in emerging areas of science, technology, and social studies. Looking ahead, MANUU remains committed to strengthening its academic and research ecosystem, fostering meaningful collaborations, and contributing to national development by preparing learners to respond thoughtfully to evolving societal and technological challenges.

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

The Department of Computer Science and Information Technology was established in 2006 with the objective of imparting quality education and advancing excellence in computer science, information technology, and interdisciplinary research. The department currently offers B.Tech in Computer Science, M.Tech in Computer Science, and a two-year MCA programme, all approved by the All India Council for Technical Education (AICTE). Lateral entry into the second year of the B.Tech programme is also available for eligible polytechnic students. In addition, the department supports research programmes including full-time and part-time PhD, as well as self-financed PhD and M.Tech modes, contributing to a strong research culture.

The department provides a stimulating academic environment supported by dedicated faculty members, well-equipped laboratories, and progressive teaching practices. Academic and research focus areas include artificial intelligence, machine learning, personalized learning, computational sustainability, blockchain technology, the semantic web, and the Internet of Things. The department is actively involved in funded research, including projects supported by the Ministry of Electronics and Information Technology. Through its academic programmes and research initiatives, the department aims to prepare students with strong analytical, programming, and problem-solving skills, enabling them to contribute effectively to industry, government, research, and academia.

ICCIDSDT-2026

The International Conference on Computational Intelligence, Data Science & Digital Transformations (ICCIDSDT-2026) is scheduled to be held on January 15–16, 2026. The conference aims to bring together researchers, academicians, industry experts, and practitioners from across the globe to discuss recent advancements and emerging trends in computational intelligence, data science, digital transformations, and allied areas.

ICCIDSDT-2026 will feature research paper presentations, keynote addresses by eminent speakers, and interactive technical sessions, providing a collaborative platform for the academic and professional community. The conference seeks to facilitate knowledge exchange, foster interdisciplinary research, and explore innovative solutions and practical applications that address contemporary challenges in the rapidly evolving digital era.

ABOUT ORGANIZER

The International Conference on Computational Intelligence, Data Science & Digital Transformations (ICCIDSDT-2026) is organized by the Department of Computer Science and Information Technology, School of Technology, Maulana Azad National Urdu University (A Central University), Hyderabad, Telangana, India.

The Department of Computer Science and Information Technology, MANUU, is committed to fostering academic excellence and promoting cutting-edge research in emerging areas of computational intelligence, data science, and digital technologies. Through ICCIDSDT-2026, the department aims to provide a vibrant platform for researchers, academicians, industry professionals, and young scholars to exchange innovative ideas, share state-of-the-art research outcomes, and discuss recent trends and future challenges in the rapidly evolving digital landscape.

CONFERENCE THEMES & TRACKS

The 2026 International Conference on Computational Intelligence, Data Science, and Digital Transformations (ICCIDSDT 2026) is a premier platform for bringing together researchers, academicians, industry professionals, and practitioners from diverse domains who are engaged in the study and application of computational intelligence, data-driven technologies, and digital transformation. The conference aims to foster innovation, knowledge exchange, and collaboration by highlighting significant advancements, emerging trends, and practical applications in these interdisciplinary areas.

ICCIDSDT 2026 encourages research contributions that address real-world challenges, development of intelligent systems, novel algorithms, data analytics techniques, and digital platforms that enhance decision-making, efficiency, and accessibility across industries and academia. The conference also emphasizes interactive sessions, paper presentations, expert panels, and keynote lectures to promote dialogue and networking among participants.

The scope of the conference includes, but is not limited to:

- Computational Intelligence & Machine Learning
- Data Science, Big Data Analytics & Predictive Modeling
- Digital Transformation & Web-Based Applications
- Artificial Intelligence in Finance, Healthcare, and Education
- IoT, Cloud Computing, and Smart Systems
- Visualization, Human-Computer Interaction, and Decision Support Systems

CONFERENCE HIGHLIGHTS

The International Conference on Computational Intelligence, Data Science, and Digital Transformations (ICCIDSDT-2026) is a two-day global academic event that brings together researchers, academicians, industry professionals, and practitioners to discuss recent advances and emerging trends in computational intelligence and data-driven digital technologies. The conference provides a multidisciplinary platform for knowledge exchange, collaboration, and innovation across academia and industry.

Key highlights of ICCIDSDT-2026 include:

- Conference Duration: 2 Days (15–16 January 2026)
- Total Papers Received: 300+
- Papers Accepted for Presentation: Selected through a rigorous peer-review process
- Participating Institutions: National and International Universities, Research Institutes, and Industry Organizations
- Countries Represented: India and other international contributors
- Keynote & Invited Talks: Delivered by eminent academicians and industry experts

Major Focus Areas:

- Computational Intelligence and Machine Learning
- Data Science and Big Data Analytics
- Artificial Intelligence Applications
- Internet of Things, Cloud Computing, and Smart Systems
- Digital Transformation in Healthcare, Education, and Industry

PROGRAM SCHEDULE (DAY-WISE)


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15th & 16th January - 2026
ORGANIZED BY
Department of Computer Science & Information Technology,
School of Technology, Maulana Azad National Urdu University,
Hyderabad, Telangana, India.



Prof. Syed Ainul Hasan
Chief Patron
ICCIDSDT-2026

Prof. R. S. Nirjar
Chief Guest
ICCIDSDT-2026



STEERING COMMITTEE



CONFERENCE CHAIRMAN

Prof. Abdul Wahid
Dean, School of Technology, Maulana Azad National Urdu University, Hyderabad, India



VALEDICTORY ADDRESS

Dr. Santosh K. Pandey
Scientist 'E'/Additional Director, Ministry of Electronics & Information Technology (MeitY), Government of India



GUEST OF HONOR

Prof. Sk. Ishtiaque Ahmed,
Registrar, Maulana Azad National Urdu University, Hyderabad, India



KEYNOTE SPEAKER

Dr. Vishnu S. Pendyala
Department of Applied Data Science, San Jose State University, USA



KEYNOTE SPEAKER

Dr. Ts. Syarifah Bahiyah Rahayu
Director, Cyber Security & Digital Industrial Revolution Centre, Institute of CyberSecurity and Electronic Systems, UPNM, Malaysia



GUEST OF HONOR

Prof. Dr. Stefan Wolfgang Pickl
Chair for Operations Research, Department of Computer Science, Universität der Bundeswehr München, Germany



CONFERENCE DIRECTOR

Prof. Pradeep Kumar
Head Department Of CS & IT, Maulana Azad National Urdu University, Hyderabad, India



GUEST OF HONOR

Prof. Khairol Amali bin Ahmad
Professor, Faculty of Engineering National Defence University of Malaysia Kuala Lumpur, Malaysia



CONFERENCE CONVENOR

Mr. Mohatesham Pasha Quadri
Assistant Professor, Department of CS & IT, Maulana Azad National Urdu University, Hyderabad, India


Department of Computer Science & Information Technology, School of Technology,
Maulana Azad National Urdu University, Hyderabad
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and Digital Transformations
15th January - 2026
Presidential Address
Prof. Syed Ainul Hasan
Hon'ble Vice Chancellor,
Maulana Azad National Urdu University, Hyderabad
Inaugural Address
Prof. R. S. Nirjar (Chief Guest)
Former Chairman, AICTE, Former Vice Chancellor,
Gautam Buddha University, Greater Noida
Welcome Address
Prof. Abdul Wahid
Conference Chairman, ICCIDSDT-2026
Dean, School of Technology & Director i/c, CIT, MANUU, Hyderabad, India
About ICCIDSDT 2026
Prof. Pradeep Kumar
Conference Director, ICCIDSDT-2026
Professor and Head, Department of CS & IT, MANUU, Hyderabad, India
Address by
Prof. Dr. Stefan Wolfgang Pickl
Chair for Operations Research, Department of Computer Science
Universität der Bundeswehr München, Germany
Address by
Dr. Ts. Syarifah Bahiyah Rahayu
Director, Cyber Security & Digital Industrial Revolution Centre
Institute of CyberSecurity and Electronic Systems
National Defense University of Malaysia, Malaysia
Address by
Prof. Sk. Ishtiaque Ahmed
Guest of Honor, ICCIDSDT-2026
Registrar, MANUU, Hyderabad, India
Vote of Thanks
Mr. Mohatesham Pasha Quadri
Convenor, ICCIDSDT-2026, Assistant Professor, Department of CS & IT,
MANUU, Hyderabad, India
Date : 15 January 2026
Time : 10:00 am - 11:15 am
Venue : Seminar Hall, Dept of CS & IT



Department of Computer Science & Information Technology, School of Technology, Maulana Azad National Urdu University, Hyderabad

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ICCIDSDT-2026

International Conference on Computational Intelligence, Data Science, and Digital Transformations (ICCIDSDT-2026)

15th & 16th January - 2026

DAY 1 | Jan 15 , Thursday

AGENDA

09:00am - 10:00am	Registration
10:00am - 10:10am	Commencement of Programme with Qura'n verses followed by MANUU Tarana
10:10am - 10:12am	Welcome Address by **Prof. Abdul Wahid,** Dean, School of Technology, MANUU and Conference Chairman, ICCIDSDT 2026
10:12am - 10:20am	Felicitation of the Guests
10:20am - 10:22am	About the Conference by **Prof. Pradeep Kumar,** Head, Department of CS & IT, MANUU and Conference Director, ICCIDSDT 2026
10:22am - 10:27am	Inaugural Address by **Prof. Stefan Wolfgang Pickl,** Chair for Operations Research, Department of Computer Science, Universität der Bundeswehr München, Germany
10:27am - 10:32am	Address by **Dr. Ts. Syarifah Bahiyah Rahayu,** Director, Cyber Security & Digital Industrial Revolution Centre, Institute of CyberSecurity and Electronic Systems National Defense University of Malaysia, Malaysia
10:32am - 10:42am	Address by **Dr. Santosh K. Pandey,** Scientist 'E'/Additional Director, Ministry of Electronics & Information Technology (MeitY), Govt. of India
10:42am - 10:47am	Address by registrar **Prof. Sk. Ishtiaque Ahmed,** Patron, ICCIDSDT-2026, Registrar, MANUU, Hyderabad, India
10:47am - 10:57am	Address by chief guest **Prof. R. S. Nirjar,** Former Chairman, AICTE, Former Vice Chancellor, Gautam Buddha University, Greater Noida
10:57am - 11:07am	Presidential Address by **Prof. Syed Ainul Hasan,** Hon'ble Vice Chancellor, MANUU, Hyderbad - India.
11:07am - 11:08am	Vote of Thanks by **Mr. Mohatesham Pasha Quadri,** Convenor, ICCIDSDT-2026, Assistant Professor, Department of CS & IT, MANUU, Hyderabad, India
11:08am - 11:10am	National Anthem
11:10am - 11:30am	Tea Break
11:30am - 11:40am	Address by **Dr. Santosh K. Pandey,** Scientist 'E'/Additional Director, Ministry of Electronics & Information Technology (MeitY), Govt. of India
11:40am - 12:00pm	Keynote Speaker : **Dr. Vishnu S. Pendyala,** Faculty member, Department of Applied Data Science, San Jose State University- San Jose, CA 95192, United States
12:00pm - 02:00pm	Lunch Break
02:00pm - 03:30pm	Paper Presentation : Session - 1, Parallel Session - 2 & 3
03:30pm - 05:00pm	Paper Presentation : Session - 4, Parallel Session - 5 & 6

International Conference on Computational Intelligence, Data Science, and Digital Transformations (ICCIDSDT-2026)

Department of Computer Science & Information Technology, School of Technology, Maulana Azad National Urdu University, Hyderabad

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International Conference on Computational Intelligence, Data Science, and Digital Transformations (ICCIDSDT-2026)

15th & 16th January - 2026

DAY 2 | Jan 16 , Friday

AGENDA

09:45am - 11:30am	Paper Presentation : Session - 7, Parallel Session - 8 & 9
11:30am - 11:45am	Tea Break
11:45am - 12:30pm	Keynote Speaker : **Dr. Ts. Syarifah Bahiyah Rahayu,** Director, Cyber Security & Digital Industrial Revolution Centre, Institute of CyberSecurity and Electronic Systems National Defense University of Malaysia, Malaysia
12:30pm - 02:30pm	Lunch Break
VALEDICTORY SESSION	
02:30pm - 02:35pm	Conference Report : **Mr. Mohatesham Pasha Quadri,** Convenor, ICCIDSDT-2026, Assistant Professor, Department of CS & IT, MANUU, Hyderabad, India
02:35pm - 02:50pm	Address by **Prof. Khairol Amali bin Ahmad,** Professor, Faculty of Engineering National Defence University of Malaysia, Kuala Lumpur, Malaysia
02:50pm - 03:05pm	Valedictory Address by chief guest **Dr. Santosh K. Pandey,** Scientist 'E'/Additional Director, Ministry of Electronics & Information Technology (MeitY), Govt. of India
03:05pm - 03:50pm	Certificate Distribution
03:50pm - 03:55pm	Vote of Thanks by **Mrs. Geeta Pattun,** Assistant Professor, Department of CS & IT, MANUU, Hyderabad, India
03:55pm - 03:57pm	National Anthem
03:57pm onwards	High Tea

With the august presence of



CHIEF PATRON
Prof. Syed Ainul Hasan
Hon'ble Vice Chancellor, MANUU, Hyderabad, India



CHIEF GUEST INAUGURAL
Prof. R. S. Nirjar
Former Chairman, AICTE, Former Vice Chancellor, Gautam Buddha University, Greater Noida



CHIEF GUEST VALEDICTORY
Dr. Santosh K. Pandey
Scientist 'E'/Additional Director, Ministry of Electronics & Information Technology (MeitY), Government of India



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Dean, School of Technology & Director of CIT, MANUU, Hyderabad, India



GUEST OF HONOR
Prof. Sk. Ishtiaque Ahmed
Registrar MANUU, Hyderabad, India



GUEST OF HONOR
Prof. Khairol Amali bin Ahmad
Professor, Faculty of Engineering National Defence University of Malaysia, Kuala Lumpur, Malaysia



CONFERENCE DIRECTOR
Prof. Pradeep Kumar
Professor and Head, Department of CS & IT, MANUU, Hyderabad, India



GUEST OF HONOR
Prof. Dr. Stefan Wolfgang Pickl
Chair for Operations Research, Department of Computer Science, Universität der Bundeswehr München, Germany



KEYNOTE SPEAKER
Dr. Srinivas Pentyala
Director of Translational Research Faculty in Orthopedics, Urology, Health Sciences, Physiology & Biophysics and Mechanical Engineering



KEYNOTE SPEAKER
Dr. Vishnu S. Pendyala
Faculty member, Department of Applied Data Science, San Jose State University- San Jose, CA 95192, United States



KEYNOTE SPEAKER
Dr. Ts. Syarifah Bahiyah Rahayu
Director, Cyber Security & Digital Industrial Revolution Centre, Institute of CyberSecurity and Electronic Systems, UPNM, Malaysia



CONFERENCE CONVENOR
Mr. Mohatesham Pasha Quadri
Assistant Professor, Department of CS & IT, MANUU, Hyderabad, India


Department of Computer Science & Information Technology, School of Technology,
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16th January - 2026
ICCIDSDT - 2026 Report
Mr. Mohatesham Pasha Quadri
Conference Convenor, ICCIDSDT-2026
Assistant Professor, Department of CS & IT, MANUU, Hyderabad, India
Address by
Prof. T. V. Vijay Kumar
School of Computer & Systems Sciences, Jawaharlal Nehru University, New Delhi
Address by
Prof. Khairol Amali bin Ahmad
Professor, Faculty of Engineering
National Defence University of Malaysia, Kuala Lumpur, Malaysia
Valedictory Address
Dr. Santosh K. Pandey
Scientist 'E'/Additional Director,
Ministry of Electronics & Information Technology (MeitY), Govt. of India
Vote of Thanks
Mrs. Geeta Pattun
Assistant Professor
Department of CS & IT, MANUU, Hyderabad, India
Date : 16 January 2026
Time : 2:30 pm - 4:00 pm
Venue : Seminar Hall, Dept of CS & IT

ABSTRACT OF PAPERS

PID-24: Bridging Heritage: A Deep Learning Model for Digitizing Ancient Kaithi Script

Anurag kumar Rajak
Birla Institute of Technology,
Mesra, Ranchi, Jharkhand, INDIA

Amit Prakash
Birla Institute of Technology,
Mesra, Ranchi, Jharkhand, INDIA

Abstract: Indic scripts and their diverse forms, ligatures and diacritic marks would necessitate an advanced method of recognition which is beyond the simple means of the scripts. The technique of moving from the conventional statistical methods to methods of deep learning methods has been used to digitize and preserve the ancient scripts of Kaithi. By making use of handwritten character recognition with the ViDAT neural networks. The system which has been devised aims to join culture and artificial intelligence for the sustainable preservation of the language diversity of India. Previous work on ancient scripts recognition have mainly dealt with popularly known scripts and but little has been done with lesser known scripts like Kaithi. The present work is a progressive past of the work being done in this direction by the combination of methods based on convolutional and transformer-based approaches for the vexed structure of ancient scripts. The model uses a ViDAT model where convolutional layers are used for extracting local features of handwritten characters and transformer-based mechanisms for global context of the characters. A carefully curated dataset with Kaithi characters derived from the ancient monuments has been used in the training of the model. The model has been trained with optimized techniques and verified with a well-balanced dataset of Kaithi script images. It achieved an accuracy of training at 99.49% and checking accuracy at 93% testing a specialized with generalization performance. The model showed high accuracy in classification with all the character classes and by this has proved to be useful in recognition of handwritten characters of Kaithi Script. The high measure of performance showed by the present system endorses its capability digitally of preserving the ancient script. The present work is reliable and gives an accuracy-based AI solution for the conservation of the Kaithi Script. By its high rates of recognition obtained it sets a foundation.

Keywords: Handwritten Character Recognition, Kaithi Script, Cultural Heritage Digitization, Tri-branch, Transformer

PID-41: DDoS attack detection and mitigation using bio inspired approaches: A Survey

Sambasiva V
Siddharth Institute of Engineering & Technology

Shaik Jumlesha
Annamacharya Institute of Technology and Sciences, Tirupati

Abstract: The stability and security of contemporary digital infrastructures are still being significantly challenged by Distributed Denial-of-Service (DDoS) attacks. As attack patterns grow in complexity and scale, conventional detection and mitigation strategies often fall short in addressing real-time adaptability and accuracy requirements. In response, bio-inspired computing techniques have garnered significant attention in the cybersecurity sector as a result of their adaptability to dynamic environments and their ability to solve problems efficiently. This survey paper offers a comprehensive examination of bio-inspired methodologies, including hybrid models, Artificial Bee Colony (ABC), Genetic Algorithms (GA), Particle Swarm Optimization (PSO), Ant Colony Optimization (ACO), and Artificial Immune Systems (AIS), that have been employed in the detection and mitigation of DDoS attacks. The paper examines the fundamental principles of each algorithm, their implementation in intrusion detection systems (IDS), and their comparative performance in a variety of network scenarios, such as cloud computing, IoT, and software-defined networking (SDN). Furthermore, the sur-vey emphasizes the current trends, challenges, and potential research directions in the development of scalable and intelligent defense mechanisms. The objective of this work is to establish a foundation for researchers and practitioners who are in-terested in improving the resilience of DDoS systems by utilizing biologically in-spired methods..

Keywords: DDoS, Artificial Bee Colony, Genetic Algorithms, Particle Swarm Optimization, Ant Colony Optimization, software-defined networking.

PID-44 Agricultural Yield Predictions Across Indian States with Machine Learning Approaches

Md Hayatul
Maulana Azad National Urdu University

Mohammad Islam
Maulana Azad National Urdu University

Abstract: India's economy is based primarily on agriculture, and crop output is essential to both economic stability and food security. In this study, we investigate how machine learning algorithms may be used to forecast crop production in different Indian states. Our goal is to create reliable models that can precisely predict crop yields by utilizing historical data on soil characteristics, climate, and agricultural methods. The study focuses on determining the variables that have the greatest influence on yield and assessing how well various machine learning methods, such as regression models, perform. Neural networks and decision trees. Our research shows that it is feasible to improve crop yield projections by machine learning, which can help stakeholders, farmers, and politicians make well-informed decisions to maximize agricultural productivity and reduce risks related to resource management and climate change. The suggested models could be modified and expanded for application in different areas, advancing precision agriculture in India.

Keywords: Agricultural crop yield, Climate impact, Decision trees, Machine learning, Precision agriculture

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PID-46: Predicting the Stress Level of Students Using Supervised Machine Learning and Artificial Neural Networks

Taskeen Nasim
Maulana Azad National Urdu University

Mohammad Islam
Maulana Azad National Urdu University

Abstract: The ability of machine learning to process big data and extract meaningful information has led to its extremely high popularity in online

technology, healthcare, and finance. The main goal of this study is to create a model for predicting the student stress classification from physiological signals with gradient boosting classifiers, i.e., Light Gradient Boosting Machine (LightGBM) and Extreme Gradient Boosting (XGBoost). Used data are 3D positional coordinates (X, Y, Z), body temperature (TEMP), heart rate (HR), and electrodermal activity (EDA). Feature transformation, exploratory data analysis (EDA), data preprocessing, and Principal Component Analysis (PCA) are some of the techniques encompassed in the methodological process. We used standard metrics like accuracy and the confusion matrix to judge how well they did after training the classifiers on the larger dataset. Experimental results show that both models work very well, with XGBoost doing a little better than LightGBM when the default settings are used. The results show that gradient boosting can help with processing large amounts of structured physiological data and that data transformation methods like cube root normalisation and PCA can help with stress classification tasks.

Keywords: Machine Learning, LightGBM, XGBoost, PCA, Feature Engineering, Stress Detection, Classification, EDA, Confusion Matrix, Student Wellbeing.

PID-48: Analysis of Student's Stress using Machine Learning

Zohra Khatoon
Maulana Azad National Urdu University, Hyderabad

Mohammad Islam
Maulana Azad National Urdu University, Hyderabad

Abstract: One problem college student often face is stress. They'll experience it from a variety of sources, such as their internal or external expectations. As a result, stress begins to affect their academic performance. While away from home every day, the pressure of achieving high grades, keeping up with the social life of other students, and dealing with financial problems is intense. Stress has become a common part of students' lives, but few attempt suicide as a result. Approximately every 55 minutes, a student commits suicide, according to the latest government data. In 2016 alone, 9,474 suicides were reported among students. Of these suicides, about one-fourth were attributed to failure at examinations. Maharashtra recorded the highest number of suicides among

students with a total 1125 cases in 2016 being recorded in which 14% of the total was contributed by just one state alone, it is followed by West Bengal and Tamil Nadu together contributing a combined 29%. This study evaluates the stress level of participating undergraduate students within the university campus by using GSR and PPG signals. In the proposed model, we used 6 different machine learning methods and the Ensemble Learning method which have been compared with different settings to find the most accurate method. Furthermore, gender differences were also taken into account for obtaining the most accurate vision. To alleviate stress and improve students' wellbeing, we would need to understand academic stress and the level of stress in order to develop proper medication techniques and counselling modules.

Keywords: Academic Stress, GSR, PPG, SVM, KNN, Naïve Bayes, Decision Tree, Logistic Regression, Random Forest and Ensemble Learning

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PID-53: Ensemble Machine Learning on Multimodal EEG, Behavioral, and Demographic Data for Early Intellectual Disability Detection

Mohammad Islam
Maulana Azad National Urdu University, Hyderabad
islam@manuu.edu.in

Abdul Wahid
Maulana Azad National Urdu University, Hyderabad
awahid@manuu.edu.in

Abstract: Early identification of neurodevelopmental disorders such as intellectual disability (ID) is critical for timely interventions that improve lifelong outcomes. This study presents an automated framework combining multimodal data—resting-state EEG signals, standardized behavioral assessments, and demographic variables—to enhance early ID detection. We developed base learners including Random Forest, Support Vector Machine, and Deep Neural Network models, and integrated their predictions via a weighted soft-voting ensemble. To address class imbalance, the Synthetic Minority Over-sampling Technique (SMOTE) was applied after data splitting. Data preprocessing involved denoising EEG recordings, imputing missing values, feature extraction (spectral band powers, behavioral scores,

demographic encoding), and normalization. Model interpretability was ensured using SHapley Additive exPlanations (SHAP) and permutation importance analyses to reveal key predictors such as age at onset, delta/theta EEG band features, and adaptive behavior scores. The ensemble achieved 96.1% accuracy, 0.95 precision, 0.96 recall, 0.95 F1-score, and 0.98 ROC-AUC in stratified k-fold cross-validation, outperforming individual learners. These results demonstrate robust, generalizable performance across heterogeneous data. The proposed system emphasizes explainable AI, reproducibility through documented pipelines, and clinical utility by delivering transparent risk assessments to support screening and referral workflows. Our framework lays the groundwork for integration into scalable digital health platforms and telemedicine tools, facilitating early, data-driven neurodevelopmental disorder screening in diverse clinical settings.

Keywords: Academic Stress, GSR, PPG, SVM, KNN, Naïve Bayes, Decision Tree, Logistic Regression, Random Forest and Ensemble Learning

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PID-54: Advances in Computational Strategies for Studying Long Non-coding RNAs: From Preprocessing to Functional Annotation

Suheel Yousuf Wani
Maulana Azad National Urdu University, Hyderabad

Abdul Wahid
Maulana Azad National Urdu University, Hyderabad

Abstract: Long non-coding RNAs (lncRNAs) are RNA molecules longer than 200 nucleotides that do not encode proteins but play essential roles in regulating gene expression and cellular processes. Despite their importance, the preprocessing and analysis of lncRNA data remain challenging due to their complexity and the vast amount of RNA-Seq data. This review introduces an intelligent pipeline for the preprocessing and analysis of lncRNAs, integrating advanced computational tools and databases to streamline the workflow. The pipeline includes several critical steps: data acquisition, quality control, alignment, transcript assembly, and quantification, followed by lncRNA identification, differential expression analysis, and functional annotation.

Quality control is ensured using tools like FastQC and Trimmomatic to maintain high-quality input data. Alignment tools such as HISAT2, STAR, and TopHat2 efficiently map RNA-Seq reads to reference genomes. Transcript assembly and quantification are performed with Cufflinks, StringTie, Kallisto, and HTSeq to accurately reconstruct and measure transcript abundances. Tools like Cuffcompare, gffcompare, CPAT, and PLEK are emphasized for their effectiveness in distinguishing lncRNAs from coding RNAs. Differential expression analysis using DESeq2, EdgeR, and NOIseq identifies significant changes in lncRNA expression. Finally, functional annotation leverages various databases and tools to elucidate the roles of lncRNAs in biological pathways. This comprehensive pipeline is crucial for facilitating the accurate identification and functional characterization of lncRNAs, significantly advancing genomic research and therapeutic development. By utilizing this intelligent workflow, researchers can better understand the complex regulatory networks mediated by lncRNAs, leading to novel insights into gene regulation and potential therapeutic targets. This review underscores the importance of an efficient pipeline in advancing lncRNA research and its implications for future scientific discoveries.

Keywords: Computational pipeline, Differential expression analysis, Functional annotation, Gene regulation, Long non-coding RNAs (lncRNAs), RNA-Seq data analysis

PID-55: Enhancing Intrusion Detection Efficiency Using Hybrid Models Based on Convolutional Neural Networks (CNNs)

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Abstract: With the ever-increasing volume of internet traffic comes an equally increased need to safeguard computer networks from malicious attacks. It is possible that more sophisticated intrusion detection systems missed them. Our aim is to enhance the detection accuracy of a Hybrid deep neural network model. The response is that LSTMs, GRUs, and deep artificial neural networks (DNNs) will step in. The NSL-KDD dataset is used for training and evaluation in this work. When it came to learning spatial and temporal patterns in network traffic, the CNN-LSTM model performed better than the other model in terms of F1-score, recall, accuracy, and precision. That didn't happen in the CNN-GRU subset. The comprehensive research delves deeply into several subjects, including hyperparameter adjusting and its potential use in present intrusion detection systems.

Keywords: Intrusion Detection, CNN, LSTM, GRU, NSL-KDD, Confusion Matrix, Deep Learning.

PID-59: Medical Image Classification Using Meta Learning

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Abstract: The rapid advancement of deep learning techniques has significantly enhanced the performance of automated systems in medical image analysis. However, these models often require large volumes of labeled data, which poses a critical challenge in the medical domain due to limited availability and the need for expert annotation. This project addresses this problem by proposing a few-shot learning framework for histopathological image classification of breast cancer subtypes using the BreakHis dataset. The proposed approach combines a pre trained ResNet-50 convolutional neural network as a fixed feature extractor with lightweight classical classifiers such as Support Vector Machines (SVM) with RBF kernel and Logistic Regression. By leveraging training and testing under 1-shot and 3-shot learning settings, the model is trained to generalize from limited labeled examples. The framework avoids complex meta-learning components by decoupling feature extraction and classification, leading to improved interpretability, faster execution, and ease of deployment. Experimental results on the BreaKHis dataset (100X magnification) demonstrate that the proposed method achieves competitive or superior accuracy compared to existing meta-learning models such as MedOptNet, while significantly reducing computational overhead. This work highlights the potential of hybrid deep learning and classical machine learning approaches for practical deployment in resourceconstrained clinical environments.

Keywords: Meta Learning, BreakHis, Support Vector Machine, ResNet50, Logistic Regression

PID-60: A Hybrid Approach for Fake Review Detection Based on Transformer Embeddings and Reviewer Behavior

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Abstract: E-commerce companies are facing an increasing problem with fake reviews, which influence customer choices and erode confidence in online markets. Traditional machine learning techniques, such Naive Bayes and SVM, are less successful in identifying subtle semantic clues or behavioral abnormalities because they primarily rely on surface-level text properties. In order to overcome this constraint, we introduce a hybrid paradigm that combines reviewer behavioral indicators such as, review length, and star ratings with BERT-based contextual embeddings. A dataset of Amazon reviews was used to test the model, and rule-based behavioral heuristics were used to give labels. With a high accuracy of 93%, our hybrid method continuously beat separate text-based or behavior-only models. The results demonstrate that a more robust and flexible approach to detecting fraudulent reviews is offered by integrating behavioral analysis with language context.

Keywords: Fake review detection, BERT, Behavioral features, Sentiment analysis, Hybrid model, Machine learning, E-commerce, Text classification

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PID-62: Smart Storage and Transportation for Agricultural Goods

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Abstract: Post-harvest losses and inefficiencies in agricultural storage and transportation remain a critical challenge. This work offers an AI-IoT framework to monitor and control the environmental aspects of agricultural storage and transport systems. The system aims to prevent post-harvest spoilage by continuously monitoring temperature, humidity and gas concentration with low-cost sensors connected to an edge device based on Raspberry Pi. Sensor data is on the one hand processed in a decentralized manner to enable real time decision-making in a restricted environment. A machine learning model built on the collected environmental data can predict spoilage-prone situations with up to 91% predictive performance. The system provides real time feedback with the potential for remote access via a web based interface such that threshold setting is user configurable. Experimental observations suggest that the proposed approach can enhance produce preservation while maintaining low computational overhead. Owing to its modular design and cost efficiency, the framework can be extended to different agricultural products and logistics settings.

Keywords: Artificial Intelligence, Internet of Things, Raspberry Pi, Spoilage Prediction, Environmental Monitoring, Deep Learning, Smart Agriculture, Food Supply Chain, Real Time Monitoring, GPS Routing.

PID-64: Decentralized Multi-Agent Reinforcement Learning for Collective Transport

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Abstract: Deep Reinforcement Learning (DRL) has great impact on controlling individual robots, but for multi-robot systems facing substantial challenges. When multiple robots learn concurrently that arises critical issue is an Nonstationary. Centralized Training Decentralized Execution applying to analyze the coordination capabilities of four prominent deep reinforcement learning algorithms (DQN, DDQN, DDPG, and TD3), investigating the scalability, resilience, and obstacle avoidance capabilities of the robot aggregate in a simulated multi-agent environment. We measure the performance as the successful transport of the object to a goal location within a desired timeframe, highlighting the strengths and weaknesses of each algorithm. On successful debate interactions. Incorporating insights from this evaluation refined our multi-agent debater and then assessed its performance using LLM-based evaluators. The pre-trained model performance rate exceeding 89% consistently by using multi-agent debater.

PID-66: Integrating Outside Knowledge in Sign Language Understanding: A Visual Question Answering Approach

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Abstract: Applying the Visual Question Answering (VQA) paradigm to sign language understanding offers a promising direction for integrating both visual and contextual knowledge, enabling more flexible and semantically rich interpretations of gestures. Unlike traditional classification approaches that rely solely on gesture-to-label mapping, VQA-based methods introduce natural

language as a bridge to external knowledge, allowing models to better capture the intent and meaning behind sign language expressions. Building on this idea, we propose a novel method for sign language understanding that formulates gesture recognition as a VQA task. Our approach transforms raw sign language video clips into question-answer pairs using concept-driven question templates. We construct synthetic VQA datasets across two domains—physics-related signs and daily greetings—where each video is associated with relevant questions and corresponding answers. A custom dataset loader is developed to efficiently process both the visual and textual modalities, using a ResNet18-based encoder for video frames and a DistilBERT model for encoding natural language questions. These embeddings are fused and passed through a classifier to predict the most likely answer. The model is trained using K-Fold cross-validation with early stopping, and attention visualization is used to interpret the model's focus on specific video frames during prediction. Experimental results show strong performance, achieving a mean accuracy of 86.28% ± 2.06% on the greeting gestures dataset and 89.53% ± 1.84% on the physics dataset. Moreover, incorporating textual information significantly enhances the model's prediction confidence, with gains of 10–20% and p-values well below the 0.05 threshold. These findings underscore the effectiveness of the VQA method in enhancing both the accuracy and interpretability of sign language understanding systems.

Keywords: Sign Language, Visual Question Answering (VQA), Natural Language Processing (NLP), BERT.

PID-69: AI in DevOps is Transforming Modern Software Engineering Practices

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Abstract: With cloud computing, the issue of guaranteeing the security of such cloud infrastructures has gained an urgent need because of threats which are growing in numbers including unauthorized access, data breaches, and even distributed denial-of-service (DDoS) attacks. This study introduces a novel hybrid Artificial Intelligence (AI) system with Random Forest (RF), Support Vector Machine (SVM), K-Nearest Neighbors (KNN), and Deep Neural Network (DNN) base models that can be used to preemptively identify and tackle cyber threats in the cloud. The system was trained and tested using benchmark datasets along with simulated real-time traffic on its accuracy, precision, recall, F1-score, and training time. The correctness of the proposed hybrid model was 98.67 % with precision of 97-82%, recall of 98-21 % and F1-score of 98-01 , which is much superior to the performance of individual AI models and traditional rule-based systems. Lower false positives and better zero-day threats adaptation were also proven by comparative experiments. Due to the combination of machine learning and the deep learning models, the detection capacity expanded together with the system durability or stability; thus, the technology is appropriate in terms of the real-time implementation in the dynamic cloud environment. The findings show that the hybrid AI methods promise to turn cloud security into a proactive system that is more reliable, with automated threat elimination mechanisms.

Keywords: Cloud Security, Hybrid AI, Threat Detection, Machine Learning, Deep Neural Network

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PID-73: Edge-Efficient Image Dehazing with MobileViT Transformers

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Abstract: Hazy images markedly impair the capabilities of computer vision models to perform object detection, tracking and scene understanding tasks, especially in outdoor and real-time settings. Dehazing models that have already been developed in the literature are often computationally heavy for use on edge devices that have limited CPU power and memory. This work presents a lightweight and efficient image dehazing model that leverages MobileViT, a vision transformer framework suitable for mobile applications. The encoder-decoder architecture for the model employs MobileViT blocks to perform feature extraction, Multi-Head SelfAttention to capture the global context, and adopt residual connections to preserve structural information. The model also contains only 2.09 million parameters to allow it to be performed in real-time on edge hardware. The model is evaluated on three benchmarks: RESIDE, NH-Haze, and Dense-Haze, with a PSNR of 22.07 and an SSIM of 0.775 on RESIDE and while there are larger representations of the model like TSNet-L that are reported to perform better, results from the work show that there is some potential for significant improvement with extended training and performance. Through this study, we are able to demonstrate that there is potential for transformer-based dehazing algorithms to be run on edge devices and we look for growing the model with deeper training and eventually knowledge distillation and then deploying it on a Raspberry Pi model with quantization.

Keywords: Image Dehazing, MobileViT, Edge Computing.

PID-74: Feature Selection using a Modified Self-Adapting Dandelion Algorithm with Opposition-Based Initialization and Distance-Aware Seed Selection for Fraud Detection in Financial Transactions

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Abstract: Financial fraud poses a significant global challenge, necessitating robust detection methods. Current approaches struggle with highly imbalanced

datasets, evolving fraud tactics, and redundant features, which degrade machine learning model performance. Effective feature selection is crucial for improving accuracy, reducing complexity, and enhancing interpretability in fraud detection systems. This paper introduces a novel feature selection approach using a Modified Self-Adapting Dandelion Algorithm (SEDA) specifically for fraud detection in financial transactions. Our algorithm incorporates two key enhancements: Opposition-Based Initialization (OBI) for diverse initial populations and a Diversity-Aware Selection Strategy (DASS) to guide seeds towards optimal regions, accelerating convergence and preventing premature stagnation. The Modified SEDA's performance is rigorously evaluated on real-world financial transaction datasets, including synthetic and proprietary sources. We compare its efficacy against established metaheuristic algorithms (GA, PSO, original SEDA) using a neural network classifier and metrics like G-mean and AUC-ROC, suitable for imbalanced data. Experimental results demonstrate that the Modified SEDA consistently outperforms comparative algorithms in both G-mean and AUC-ROC, proving its superior ability to identify fraudulent transactions with low false positives. Ablation studies confirm the significant positive impact of OBI and DASS. This research offers a robust and efficient feature selection methodology, enhancing fraud detection system accuracy and reliability in dynamic financial environments by minimizing data redundancy and noise.

Keywords: Fraud Detection, Feature Selection, Self-Adapting Dandelion Algorithm, Machine Learning, Imbalanced Classification, Financial Transactions.

PID-75: Incremental Heuristic For Rumour Minimisation in Social Networks

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Abstract: The rapid propagation of rumours in online social networks can lead to social unrest and economic loss. Effective rumour minimisation strategy requires timely identification of set of influential people who spreads the clarificatory or truth message to suppress the rumour spread. Most of the researchers rely on static influence computation or greedy strategies, which are computationally expensive and impractical for large or dynamically evolving networks. In this work, we propose an incremental heuristic algorithm for rumour minimisation that efficiently computes top k truth seed nodes after edge insertions. Our method integrates influence scores, distance from rumour sources and centrality of nodes uncombined as a node metric and selects top k seed nodes incrementally avoiding the need to recompute from scratch.We evaluate our algorithm on multiple real-world social network datasets, under dynamic graph scenarios. Experimental results demonstrate that the incremental heuristic reduces computation time by several orders of magnitude compared to static strategies, without compromising rumour suppression effectiveness. This highlights the potential of incremental approach for scalable and real-time rumour minimisation in scale social networks.

Keywords: Dynamic Social Networks, Influence Maximization, Rumour minimization.

PID-77: Explainable Graph Neural Networks for Autism Classification: A Comprehensive Analysis of Brain Connectivity Patterns

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Abstract: Autism spectrum disorder diagnosis currently relies on behavioral observations and clinical interviews, leading to subjective assessments and delayed interventions. With autism affecting approximately 1 in 36 children, there exists an urgent need for objective, reliable diagnostic tools that complement traditional methods. This research addresses a critical challenge in medical AI: developing systems that achieve high accuracy while providing clinically interpretable explanations for their predictions. This study presents a comprehensive approach treating brain connectivity as network structures, where brain regions function as nodes and connections represent edges. The research implements and compares three Graph Neural Network architectures alongside traditional machine learning methods, all applied to functional connectivity data from the ABIDE dataset containing 200 subjects. The experimental results demonstrate exceptional performance across multiple approaches. Random Forest classification achieved 98.3% accuracy, while the optimized Graph Convolutional Network reached 93.8% accuracy. Through systematic SHAP analysis, the study identifies specific brain connectivity patterns driving these predictions. The analysis reveals that frontal-frontal connections, particularly the ROI 000-ROI 001 pathway (importance score: 0.156), serve as the most discriminative features for autism classification. The framework provides individual-level explanations for each prediction, identifying precise connectivity patterns that contribute to autism classification. This capability offers clinicians concrete neurobiological evidence to support diagnostic decisions, successfully bridging the gap between

high-performance AI and the interpretability requirements essential for medical applications.

Keywords: Explainable AI, Graph Neural Networks, Autism Diagnosis, Brain Connectivity, SHAP Analysis, Medical AI, Neuroimaging

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PID-85: Adaptive Algorithmic Fairness: A Reinforcement Learning Approach to Dynamic Bias Mitigation

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Abstract: Abstract. Artificial intelligence systems are increasingly being used in domains where decision-making is highly essential, such as recruitment, finance, healthcare, etc. In such domains biased outcomes can reinforce inequalities in the society caused by historically imbalanced data. This paper investigates this bias using a controlled synthetic dataset that mimics the disparities across gender, age, and ethnicity. Multiple classification models are evaluated using standard performance metrics alongside fairness measures, including demographic parity and equalized odds. In addition to established preprocessing, in-processing, and post- processing bias mitigation techniques, this work proposes an adaptive re- inforcement learning-based framework that treats fairness as a dynamic, sequential optimization problem. The proposed solution adjusts the decision thresholds as per the real- time fairness feedback, making the algorithm adaptive. Experimental results in this paper demonstrate that the adaptive framework achieves a 90% reduction in demographic parity difference while maintaining pre- dictive accuracy. This outperforms static

fairness mitigation methods in balancing fairness and accuracy. The findings in this paper highlight the limitations of traditional static fairness interventions and highlight the need for continuous fairness mon- itoring and adaptive bias mitigation. The proposed framework makes AI systems more robust, responsible, and accountable for deployment in dynamic real-world environments.

Keywords: Algorithmic Fairness · Reinforcement Learning · Adaptive Bias Mitigation Responsible AI Data Mining Dynamic Thresholding Fairness Monitoring

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PID-89: Benchmarking Tree-Based Ensembles with LIME-Driven Insights: A Transparent Pipeline for Breast Cancer Diagnosis

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Abstract: Breast cancer is still the world's largest cause of death for women, which emphasizes the need for precise and understandable computer-aided diag- nostic instruments. By comparing three popular tree-based ensemble classifiers- Random Forest, Extra Trees, and XGBoost - we propose an open and compre- hensible pipeline for the classification of breast cancer. The evaluation of the classification models is conducted using a multi-split approach (60:40, 70:30, 80:20, and 90:10) to guarantee generalizability and robustness across

different ratios of training to testing. Using 5-fold cross-validation over grid search spaces of tree depth and ensemble size, hyperparameter tuning is carried out, and the outcomes are displayed using 3D metric surfaces. The Extra Trees classifier had the highest accuracy (97.36%), recall (up to 99.07%), and fl-score (97.93%) of all the models. Under limited data splits, XGBoost performed better in terms of precision. We incorporate Local Interpretable Model-Agnostic Explanations (LIME) into the final tuned XGBoost model to improve model transparency. LIME offers case-wise visual explanations that highlight important clinical fea- tures that affected the classification decisions, including texture, perimeter, and worst concave points. This integrated strategy provides a solid basis for clinical decision assistance by bridging interpretability and strong prediction perfor- mance. The suggested process facilitates feature-level comprehension, which is essential for adoption in actual healthcare settings, in addition to benchmarking ensemble classifiers under controlled circumstances.

Keywords: Breast Cancer Diagnosis, Tree-Based Ensembles, Explainable AI, LIME, XGBoost, Random Forest, Extra Trees, Model Interpretation.

PID-106: Dynamic False-Negative-Driven Loss Optimization for the Diagnosis of Parkinson's disease using Handwritten DataDisease

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Abstract: This study investigates the impact of a novel loss function on the diagnosis of Parkinson's disease using convolutional neural networks trained on the NewHandPD dataset, which contains six classes of handwritten patterns from healthy individuals and Parkinson's patients. Multiple well-known convolutional neural network architectures were first trained using the standard categorical cross-entropy loss to establish baseline performance. Subsequently, each model was re-trained using the proposed False Negative Aware Dynamic cross entropy loss function, FN-DWCE, designed to penalise

misclassification of Parkinson's cases more heavily. Since false negatives in medical diagnosis can lead to missed treatments and severe patient outcomes, minimizing the false negative rate is critical. Experimental results demonstrate that the proposed loss function consistently reduces false negative rate across all tested models, leading to improved diagnostic reliability without compromising overall accuracy. This work highlights the importance of tailored loss functions in safety-critical applications like disease detection.

Keywords: Loss functions, Neural networks, Parkinson's disease, Hand-written samples, Disease diagnosis, Deep learning

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PID-117: Opportunities and Challenges of Small and Large Language Models in Machine Translation: A Review

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Abstract: Machine Translation (MT) has become an essential component of global communication, with increasing reliance on both Small Language Models (SLMs) and Large Language Models (LLMs). SLMs enable efficient and real-time translation on devices with limited computational resources. while LLMs, though resource-intensive, deliver superior contextual understanding and translation quality. This review paper examines the opportunities and challenges associated with both model types in the context of MT. key op-portunities include hybrid frameworks that combine the lightweight effi-ciency of SLMs with the expressive power of LLMs, advances in multilin-gual translation, domain-specific adaptation, and knowledge distillation techniques to optimize model size and performance. At the same time, chal-lenges persist in addressing low-resource language translation, ensuring computational efficiency, maintaining consistency across domains, and re-ducing the costs of large-scale deployment. By synthesizing recent research, methods, and applications, this review highlights how the integration of SMLs and LLMs can shape the future of machine translation, offering path-ways toward scalable, robust, and high-quality translation systems.

Kerword: Machine Translation, LLMs, SLMs, Neural Machine Translation, Multilingual MT, Low-Resource Translation

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PID-118: Explainable AI For Personality Prediction

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Abstract: Human personality is important in many fields, including education, healthcare, recruitment, and online communication. Traditionally, personality has been measured through psychological tests such as the Big Five Inventory or the Myers–Briggs Type Indicator. While these tools are well established, they take time and effort, which makes them difficult to use for large groups of people. In recent years, researchers have started using digital footprints from social media, written text, speech, and images to predict personality with the help of machine learning and deep learning methods. These approaches have improved accuracy, but they also raise a major concern: most of them behave like black boxes producing results without a clear explanation of how those results were reached. That makes them harder to trust in fields like healthcare or recruitment. Simpler machine-learning models are easier to interpret but less accurate, while deep neural networks and transformers are more powerful but less transparent. Multimodal systems that combine text, audio, and visual data achieve even higher accuracy, yet their complexity makes them difficult to explain. The field continues to face challenges such as limited datasets and the ongoing trade-off between accuracy and interpretability. Current research is moving toward hybrid designs that aim to balance performance with explainability and apply post-hoc explanation tools like SHAP, LIME, and attention visualization to build trust in predictions.

Keywords: Personality prediction, Explainable AI, Big Five Traits, Machine learning, Deep learning, Transformers, Multimodal system

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PID-119: AI-Enhanced Optimization of Alkaloid Extraction from Lupinus Luteus

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Abstract: Quinolizidine alkaloids such as lupanine and sparteine display a variety of biological activities. Lupinus luteus contains an abundance of bio active al-kaloids. The traditional methods of extraction for alkaloids have been limited due to low yields, long extraction time and high solvent volume. A compara-tive instrumental extraction analysis was conducted on the alkaloids using classical solvent extraction, ultrasound-assisted solvent extraction, and mi-crowave-assisted extraction (MAE). In addition, the molecular structure of the compounds obtained from the sample was verified by GC-MS, 1H-NMR and FT-IR spectroscopies. Three extraction methods were compared for their ability to achieve maximum citral yield from lor-guidus essential oils. The mass transfer and disruption of cell matrix were affected by MAE without decomposing the alkaloids. A Random Forest regression estimator estimators was moreover developed with independent variables as parameter ranges and dependent variable as extraction yield to gain insights for process optimiza-tion. With a small number of cases (n=9), the regression model was made but had a formidable predictive power (R2=0.82).
Keywords: Microwave-Assisted Extraction, Quinolizidine Alkaloids, Machine Learning Optimization, Process Intensification, Pharmaceutical Manufacturing.

PID-126: From bureaucracy to Blockchain: Reimagining a transparent and accountable government system

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Abstract: Traditional governance systems are hindered by concerns such as corruption, lack of public trust, inefficiency, and a lack of transparency. Implementing techniques from e-governance, it is observed that a few issues were addressed. Still, a truly disruptive solution would be to create a trust barrier and gain the system's confidence. Blockchain is a decentralized and immutable digital ledger that stores records and transactions securely across a distributed network. Each block is linked cryptographically to the previous one, forming a chain. Initially, blockchain was created to support digital currency or cryptocurrency and to facilitate more manageable cross-border payments. However, blockchain has expanded its potential beyond cryptocurrency; it is found impactful in domains such as Healthcare, government, real estate, the music industry, supply chain management, and many more. The principles of blockchain technology, including immutability, decentralization, consensus, and smart contracts, support the establishment of trust and the enhancement of government systems' effectiveness. Blockchain has various key applications in governance, such as land records and property management, voting, issuing digital certificates and public documents, and public grievance amendments. These applications focus on improving governance processes and supporting more reliable administrative systems. This paper explores case studies such as Blockchain Pilot Projects in India and Blockchain in Digital Governance in Estonia. It provides a review of the literature on blockchain technology and its applications in various government sectors, focusing on the challenges and solutions.

Keywords: Blockchain, Good Governance, Transparency, Immutability, Decentralization, Trust.

PID-128 : A Hemorrhagic Stroke Risk Prediction Using Machine Learning

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Abstract: Stroke is the leading cause of death and permanent disability worldwide, representing a severe form of cer-ebrovascular illness. There exist two main categories: ischemic stroke, with a lack of blood flow (IS), and hemorrhagic stroke, with bleeding, HS. Early and accurate risk prediction for both types of stroke is of importance for improving patient outcome, treatment planning, and prevention measures. The aim of the present project is to develop, using ML techniques, a sound and trustworthy framework for predicting the risks of both hemorrhagic and ischemic stroke.
In this study, the performance of different popular machine learning models, namely LR, RF, SVM, KNN, and Naïve Bayes, was compared. The preliminary results based on demographic, clinical, and lifestyle characteristics have shown that the Random Forest and SVM models outperform others with high accuracy and ROC-AUC values. This study proposes a new, data-driven approach for the identifi-cation and control of stroke risks.

Keywords: Random Forest, Classification, Machine Learning, Ischemic Stroke (IS), Hemorrhagic Stroke (HS), and Risk Prediction.

PID-131:Blockchain-based Food Quantity Tracking System

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Abstract: Food passes through several hands to reach consumers, and exactly how much is actually traveling across each stage usually stays uncertain. Current systems considerably focus on product identification and safety records, whereas quantity-level tracking is either assumed or maintained by isolated, error-prone databases. Traditional tracking systems face several challenges as they are error-prone, time consuming, and unable to provide reliable information on both the journey and the quantity of food items. This study identifies the lack of secure and verifiable quantity tracking as a shortcoming of the existing traceability systems. To solve it, we present a Blockchain-Based Food Quantity Tracking System by using Hyperledger Fabric. The smart contract verifies the change in quantity, applies logic protocols, and logs discrepancies as an accountable loss, while the permissioned ledger ensures a tamper-proof audit trail amongst trusted parties. The focus is on enhancing transparency, increasing accuracy and safety through upstream visibility to downstream supply chain practices, helping inventory managers make better decisions, and even having an impact in reducing food loss and waste. This research indicates that blockchain, when adapted to store both product identity and volume accountability, has the potential to revolutionize ways in which food systems oversee trust and sustainability.

Keywords: Blockchain Technology, Hyperledger Fabric, Smart Contract, Traceability, Quantity Tracking, Food Supply Chain.

PID-132: Recent Advances in Maximum Power Point Tracking Techniques for Photovoltaic Energy Systems

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Abstract: The global push for sustainable energy and reduction in greenhouse gas emissions has encouraged the need of renewable energy solutions. Solar Photovoltaic (PV) systems are increasingly being adopted as a reliable source of green energy as it can be directly converted into electricity. However, their power output is inherently variable because of changes in solar irradiance and temperature. Their conversion efficiency is relatively low. PV systems have nonlinear power output, which makes them sensitive to changes in sunlight and temperature. The nonlinearity problem becomes worst in case of Partial Shading Effect (PSE), where a small shaded area on a panel can lower the power output significantly. This creates difficulties in finding the best power point due to number of peaks in the power-voltage curve. Traditional MPPT methods are prone to failure in shaded environments, since they frequently track local maxima rather than the global optimum. To overcome these limitations and maximize energy extraction, advanced MPPT strategies are required. Nature- and bio-inspired optimization algorithms have gained attention as effective solutions, ensuring rapid convergence and precise tracking in dynamic and shaded environments. This study provides a comprehensive review of MPPT strategies, classifying them into conventional, intelligent, optimization-driven, and hybrid categories. The paper evaluates the benefits, drawbacks, and comparative efficiency of different techniques with respect to dynamic response, robustness, cost-effectiveness, and practical implementation. Results indicate that hybrid models deliver enhanced accuracy and adaptability but introduce added design challenges. The review also highlights open issues and future prospects to guide continued progress in PV-based MPPT solutions.

Keywords: Renewable Energy Optimization, Maximum Power Point Tracking (MPPT), Partial Shading Effect, Nature-Inspired Algorithms, Swarm Intelligence, Hybrid MPPT Techniques

PID-135: Enhancing Blockchain Supply Chain Security Using Deep Learning for Threat Detection and Risk Mitigation

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Abstract: Blockchain technology has completely changed supply chain management by making it safer and easier to trace, more open through decentralized networks and tamper-proof ledgers. Even though these are good things adding blockchain technology to supply chains also brings new security risks especially when it comes to smart contracts and devices that are connected to the Internet of Things. Smart contract code flaws and possible dangers linked to IoT devices, such as transaction tampering and illegal ac-cess will put the integrity and reliability of blockchain systems at risk. This paper presents a deep learning-based framework for the real-time thread detection and mitigation of cyberattacks in blockchain enabled supply chain. The proposed framework constantly monitors and analyzes data from smart contracts, blockchain transactions and IoT network interactions to find possible security risks. The framework uses advanced machine learning models like Autoencoders, Long Short-Term Memory (LSTM) networks and a mix of RNN and LSTM networks to pull out important information from this changing data stream. These models help find possible cyberattacks such as transaction manipulation, smart contract vulnerabilities, and unauthorized network access,

by spotting when a system is not acting normally. We tested this framework by running experiments on both simulated and real-world blockchain datasets. The results show that the framework has a high detection accuracy and very few false positives. This makes it a reliable and effective way to find and stop cyber threats in blockchain based supply chains. This work takes a proactive approach to making blockchain systems safer by fixing major security holes and making supply chain net-works more resilient.

Keywords: Blockchain, Deep Learning, RNN-LSTM.

PID-139: A Review on Advanced Digital Transformation in Health Services

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Abstract: Health care industry is playing an important role in today's world because of so many deceases are emerging like cancer, heart attacks, diabetics even corona virus, Blood Pleasure. Etc. People are having high concern regarding their health conditions. And in the today's busy life people are not getting time to even consult their doctors or healthcare providers. Even after getting treatments people are worrying about the medicines whether they are generic or not, do they have any side effects? And so on. The trust levels on health care providers should increase and the communication between patients and doctors should be made easy. As the technology is improved various technologies are being used in healthcare industry like IoT, Blockchain, Semantic web, Cloud storage and so on. In this article we have studied challenges in healthcare industry like security, privacy, integrity and solutions to the challenges using various emerging technologies.

Keywords: IoT, EHR, ontology, security, privacy, interoperability, Blockchain

PID-149: Digital Maturity Profiling in Higher Education: A Comparative Machine Learning Framework

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Abstract: This paper introduces DMInt-Framework (Digital Maturity Intelligence Frame-work), a novel ensemble machine learning approach for comprehensive digital maturity assessment across 3,083 higher education professors. We pioneer a triple-phase computa-tional methodology integrating: (1) multi-algorithmic clustering (K-means++, variational Bayesian GMM, and Leiden with resolution optimization) for robust pattern discovery; (2) stacked ensemble classification combining XGBoost, Neural Architecture Search-optimized networks, and Random Forest with meta-learning; and (3) multi-modal explaina-ble AI (SHAP, LIME, and counterfactual analysis) for determinant interpretation. Our framework achieves 92.3% accuracy (surpassing individual algorithms by 6.3%) and iden-tifies hierarchical feature importance, revealing that infrastructure-accessibility nex-us and pedagogical-digital alignment are primary maturity drivers. The proposed solution addresses critical scalability challenges in educational analytics for emerging economies through adaptive sampling and transfer learning components, demonstrating significant improvements over conventional approaches in robustness, interpretability, and deployment efficiency.

Keywords: Digital maturity, ensemble machine learning, clustering, XGBoost, explain-able AI, higher education

PID-152: Artificial intelligence-driven insights for proactive asthma attack prediction

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Abstract: Asthma is a long-term respiratory disorder characterized by periodic airway inflammation and obstruction, posing a substantial public health challenge worldwide. Early and accurate prediction of asthma attacks plays a crucial role in enabling timely interventions and improving patient health outcomes. This study explores the application of various machine learning algorithms to predict asthma exacerbations proactively, using a publicly available dataset sourced from Kaggle. The algorithms evaluated include Support Vector Machine(SVM), Extreme Gradient Boosting (XGBoost),Random Forest, Decision Tree, Naïve Bayes, and K-Nearest Neighbor(KNN).To enhance predictive efficiency and minimize data redundancy, the research implements Recursive Feature Elimination (RFE) alongside polynomial feature engineering. Moreover, to address class imbalance issues within the dataset, the SMOTEENN hybrid resampling approach (combining Synthetic Minority Oversampling Technique and Edited Nearest Neighbors) is utilized, ensuring robust training on underrepresented classes. Model performance is thoroughly estimated using multiple evaluation metrics, including accuracy, precision, recall, and F1-score. Among all the tested models, the Support Vector Machine achieved the highest classification accuracy of over 98%, with Random Forest and XGBoost also showing competitive predictive strength. The findings highlight the critical role of feature selection and data balancing techniques in improving model reliability, especially in medical diagnostic applications. This research further

illustrates how artificial intelligence can significantly advance early detection of asthma attacks, enabling proactive clinical decision-making and potentially reducing the burden on healthcare systems.

Keywords: Support Vector Machine, XGBoost, Random Forest, Machine learning, feature selection, SMOTEENN, artificial intelligence, and asthma attack prediction.

PID-159: Explainable AI For Early Detection Of Chronic Kidney Disease

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Abstract: Chronic Kidney Disease (CKD) is a chronic illness that progressively impairs kidney function and has grown to be a major global health concern. Early detection of chronic kidney disease (CKD) is essential for preventing complications and improving patient outcomes, although the process is frequently challenging due to the complexity of the medical data and the symptoms' overlap with other illnesses. Although many of the current machine learning (ML) models behave like "black boxes," providing little context for their predictions, ML can assist in the analysis of such data and promote early diagnosis. Several supervised machine learning methods, such as Support Vector Machine (SVM), logistic regression, random forest, and XGBoost, were employed in this investigation. To determine which clinical features were most crucial, a random forest-based feature selection method was used. According to the results, SVM had an accuracy of 98%, Random Forest and Logistic Regression both had 97.50%, and XGBoost had 96.25%. Random Forest, Gradient Boosting, and XGBoost all obtained 97.50%, 96.25%, and 96.26% during the ensemble learning phase. To make the model's predictions more transparent, Explainable Artificial Intelligence (XAI) techniques—more especially, the SHAP (SHapley Additive Explanations) method—were used.This method demonstrated the role that each clinical characteristic played in CKD prognosis. The characteristics that were shown to have the most effects were hemoglobin, specific gravity, and albumin. The suggested explainable machine

learning framework offers a dependable, comprehensible, and efficient technique for early CKD identification, assisting medical practitioners in making better judgments.

Keywords: SHAP, feature selection, explainable artificial intelligence (XAI), chronic kidney disease (CKD), machine learning (ML).

PID-161: Predictive Models for Coronary Artery Disease Detection using Machine Learning Algorithms

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Abstract: Since they are the top cause of death, cardiovascular conditions are critical to affecting mortality rates. The consequences of poor predictions are serious and could cause great harm to patients. Currently, the prediction and detection of heart disease faces significant difficulties, and continuous 24 hour monitoring is not feasible due to lack of resources. Additionally, heart disease treatments are expensive and complicated. The objective of this study is to develop accurate, simple, and machine-learning systems that can diagnose CAD.The aim of this endeavour is to compare algorithms, emphasise their clinical implications, and address ethical concerns to enhance CAD prediction, support well-informed decision-making, and enhance patient outcomes in practice. By utilizing Machine Learning techniques to predict various cardiac problems, leveraging the power of different sources of data. These approaches applied a Voting Ensemble Method that includes a Support Vector Machine (SVM), Regression, K Nearest Neighbors, Naive Bayes, AdaBoost, Decision Tree and XGBoost. There results indicate that there is no comparative analysis or significant metrics besides 90% accuracy to evaluate the methods used, this research highlights the success of the heart disease prediction majority voting ensemble method. PCA and Hyperparameter Tuning for a correct evaluation of the model. The significance of this study is that the Machine learning models can provide accurate prognoses regarding heart disease, rheumatic disease or

prognoses of unknown aetiology that will enable clinicians for early intervention and intervention to observe outcomes.

Keywords: Confusion matrix, Correlation matrix, Adaboost, XG Boost, SVM, Random Forest, Decision Tree, and Logistic Regression.

PID-164: AI-Driven Predictive Models for Sustainable Development: Hourly Energy Consumption Forecasting

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Abstract: Reliable forecasting of hourly energy consumption has become essential for achieving global sustainability targets. Accurate predictions help in balancing electricity demand, improving renewable energy integration, and reducing carbon emissions. Traditional statistical models often struggle with non-linear patterns, regional variations, and sudden changes in consumption behavior. Recent advances in Artificial Intelligence (AI) and Machine Learning (ML) provide new ways to address these challenges through adaptive and data-driven techniques. This paper reviews current research on AI-based energy forecasting methods, including Random Forest, XGBoost, and deep learning approaches. The analysis shows that these models achieve higher accuracy and flexibility compared to conventional methods, while also identifying issues such as limited local data, model transparency, and high computation cost. The study concludes that future energy forecasting systems must combine accuracy with explainability and energy efficiency to support sustainable development goals in a practical and responsible manner.

Keywords: SHAP, feature selection, explainable artificial intelligence (XAI), chronic kidney disease (CKD), machine learning (ML).

PID-165: Federated Learning-Based Cyber Attack Detection in IoT Network

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Abstract: The Internet of Things (IoT) has increased connectivity in many aspects, which also increases vulnerabilities to sophisticated types of cyber threats like DDoS attacks and botnets. The above attacks heavily affect data integrity, network reliability, or the general system robustness. Conventional centralized IDS suffers from drawbacks such as high communication overhead, privacy stenosis, and single points of failure, which may not be suitable for globalization-scale IoT systems. To solve these issues, a lightweight intrusion detection framework using Federated Learning (FL) is presented in this research work. The presented framework supports joint model training over distributed IoT devices in the absence of raw data sharing, which would compromise the privacy maintained above and the detection performance. The proposed method combines the advantages of efficient feature selection and deep learning methods to address the problems existing in non-IID data distribution, lack of computational resources, and adversarial attacks. Experimental assessment with benchmark IoT datasets such as MQTTset and ToN-IoT is anticipated to show considerable enhancement in scalability, robustness, and privacy preservation compared to the state-of-the-art works. This research aims to provide an efficient and secure practical solution for intelligent cyber-attack detection in the context of heterogeneous IoT environments.

Keywords: Internet of Things (IoT), Intrusion detection, Federated learning, Deep learning, Cybersecurity, Network security

PID-166: Predictive Analysis of Heart Disease Using Machine Learning Techniques

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Abstract: Heart Disease is one of the major health challenges across the world. Early diagnosis and better management are very important for the good outcome. In this paper, we study machine learning (ML) algorithms used for the prediction of heart disease with particular attention given to models which include Logistic Regression, Decision Tree, Random Forest, K-Nearest Neighbors (KNN), Naive Bayes and Support Vector Machine (SVM) and benchmark them on UCI Cleveland Heart Disease data set. These models obtained accuracy ranging from 85 to 91%, ensemble and mixed strategies increased the performance up to 92%. Interpretable AI methodology was used and robustness was validated through cross-validation. The review also briefly covers the significant clinical impact of the COVID-19 pandemic on people with heart problems (people with previous heart conditions were particularly at risk in terms of complications and mortality). Vaccination helped to lessen post-COVID heart issues, but some of the long-term impact remained. Together, the integration of big clinical data with interpretable ML and ensemble methods show great potential to achieve both robust early detection as well as accurate prediction of heart disease, in line with predictive healthcare analytics objectives.

Keywords: Machine learning, Ensemble learning, Explainable AI, Heart disease, Clinical data analysis.

PID-168: Securing the Remote Health Monitoring System Using Blockchain: A Survey of Logging, Access Control and Emerging Trends

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Abstract: Remote health monitoring systems (RHMS) have increased in popularity owing to the pervasive use of Internet of Medical Things (IoMT) devices, but this has created concerns regarding privacy, data integrity, and insider threats. Block-chain is an ideal solution for enhancing RHMS security as it offers decentralization, immutability, and verifiable audit trails. This work consolidates recent re-search (2020-2025) integrating blockchain with privacy-preserving cryptography, edge/fog computing, IoMT, access control models (specifically RBAC), Layer-2 scalability, and anomaly detection based on AI. We compare the suggested systems on the basis of usability, scalability, interoperability, privacy, auditability, and areas of remaining deficiencies (particularly clinical validation and real-time insider threat detection). We also put forth new research directions incorporating federated learning, Layer-2 solutions, privacy-enhancing technologies (PETs), and standard EMR integration. To present researchers and practitioners with a modern, useful overview, the review references 36 representative and current studies.

Keywords: Role-based access control, Data integrity, Blockchain, IoT, Remote health monitoring, Privacy-preserving cryptography, and Audit logs.

PID-171: Machine Learning Based Intrusion Detection System for Monitoring Attacks on Networks

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Abstract: We know in the modern world the very hard complexity and very high volume of network traffic have made machine learning based Intrusion Detection System more significant. An Important challenge arises because of very high dimensionality of network data which is often decreasing accuracy and increase high computational overhead. I observe that in recently research has used of the IV-RFE method for feature selection but it is creating a problem is their empirical and manual approach which shows limitations in replicability and adaptability. So, this paper introduces a novel and superior hybrid feature selection method name are IV-RFECV which is improve the base paper's IV-Ranking stage with an automated, data-driven, Recursive Feature Elimination with Cross-Validation (RFECV). Further, we proposed the Random Forest (RF) classifier, which acts synergistically with our feature selection process. We used the modern UNSW-NB15 dataset, it demonstrates the superiority of our end-to-end IV-RFECV-RF system. I take three primary attacks for experiment which name are DoS, Reconnaissance, and Analysis. Our proposed method achieves high weighted-average accuracies and significantly well performing the claimed outcomes of the base paper. More importantly, it demonstrates a near-perfect Recall for attacks on the highly imbalanced, real-world test set. So, my research proves that an automated, statistically robust feature selection pipeline, combined with a suitable classifier, provides a more effective and reliable solution for modern Intrusion detection challenges.

Keywords: Intrusion Detection System, Feature Selection, UNSW-NB15, IV-RFECV, Random Forest, Network Security, Machine Learning, Cybersecurity.

PID-173: DietaCare: A Hybrid Recommender for Economical, Disease specific and regional Food Basket

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Abstract: India has a serious health problem: diseases like diabetes and high blood pressure are rising fast. This means we need a new way to provide digital health advice. The apps we have now just don't work for most low-income Indians. They fail because they are too expensive, suggest non-Indian foods, and lack the specific medical logic for these diseases. This paper introduces DietaCare, a new recommender system built to solve these exact problems. It creates meal plans that are affordable, based on Indian diets, and medically safe. We developed and evaluated three distinct models in order to determine the optimal solution: a "taste-first" Collaborative Filtering model (using SVD), a "safety-first" Rule-Based Planner (using KNN), and a "best-of-both" Hybrid Model that combines the other two. When we used simulated user profiles to test all three models, the Hybrid Model emerged victorious. It received a very high user satisfaction rating (3.94 out of 5) and complied 100% of all budget and health regulations. Our results show that this hybrid approach is a powerful and practical way to create diet plans that actually work for real people. It successfully balances clinical safety, real-world cost, and personal taste.

Keywords: Recommender System, Hybrid Intelligence, Collaborative Filtering, Personalized Nutrition, Computational Dietetics, Machine Learning, Indian Cuisine, Health Informatics.

PID-176: Methods of Statistical Anomaly Detection and Clustering for Fraudulent Transactions in the Bitcoin Network

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Abstract: Detecting fraud in Bitcoin remains tough because transactions are anonymous and there are tonnes of data flowing through the blockchain every single day. Money laundering, ransomware gangs, and scam artists all exploit Bitcoin's privacy features by using random addresses that can't be traced back to real people. Banks have verification systems, but Bitcoin doesn't work that way. We needed a better approach to spot the bad transactions hiding in all that noise. We decided to use machine learning to find suspicious patterns without needing a massive database of known fraud, which nobody really has anyway. Our approach uses two main clustering techniques—K-Means and DBSCAN—to group similar transactions and spot weird ones. We also throw in some basic statistics like Z-scores and quartile ranges to catch transactions that stick out like a sore thumb from normal activity. We grabbed data from three different Bitcoin sources: Elliptic2, Bitcoin Heist, and Google's BigQuery dataset. The plan was straightforward—build something that actually works for finding fraud, compare which methods work best, and create something that blockchain analysis websites could actually use. We tested everything with standard performance metrics to see which approach caught the most suspicious stuff. The whole idea is to give people tools for catching fraud without needing a bunch of labelled examples beforehand.

PID-177: Blockchain Based Authentication in EHR to Ensure System Security and Data Privacy

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Abstract: Electronic Health Record (EHR) systems have become a fundamental component of modern healthcare by allowing medical information to be stored and exchanged digitally. Despite their widespread use, these systems still suffer from major concerns relating to privacy, security, and dependence on centralized authorities. Incidents of cyberattacks, unauthorized data exposure, and manipulation of medical records highlight the weaknesses of traditional authentication techniques such as passwords, biometrics, or single-certificate validation. To reduce these risks, this paper presents an authentication model built on blockchain and enhanced with a Fuzzy Logic–driven Multi-Factor Authentication (MFA) mechanism. Instead of approving or rejecting access on a strict binary basis, the proposed system computes a trust score using multiple parameters including certificate validity, access behavior, institutional credibility, and contextual conditions. Hyperledger Fabric is used for permissioned access control using ACLs, while large EHR files are stored in IPFS to maintain scalability. Experimental findings indicate that the proposed framework avoids single-point failures, supports fine-grained authentication decisions, and strengthens trust in digital healthcare system.

Keywords: Electronic Health Record (EHR), Blockchain, Hyperledger Fabric, FuzzyLogic, Multi-Factor Authentication, Access Control Lists (ACL), IPFS, Smart Contracts, Data Security, Privacy, Decentralized Healthcare.

PID-187: DESIGN OF AI-BASED ALZHEIMER'S DISEASE PREDICTION MODEL USING EEG SIGNALS

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Abstract: Alzheimer's disease (AD) is a "progressive neurodegenerative condition resulting in memory loss and cognitive decline", which has affected millions of people worldwide Early detection of AD is essential since timely treatment can slow its progress . This study describes a hybrid deep learning model that combines Convolutional Neural Networks (CNN) and Temporal Convolution Networks (TCN) for the analysis of electroencephalograms (EEG) for AD detection. The model automatically learns spatial and temporal patterns, allowing it to distinguish accurately between AD patients and healthy individuals. Tested on a very large EEG dataset, the model demonstrated impressive high values in accuracy, sensitivity, and specificity, indicating strong prospects for reliable and non-invasive early diagnosis.

Keywords: Data Alzheimer's disease, EEG, deep learning, Convolutional Neural Network (CNN), Temporal Convolutional Network (TCN), hybrid model, neurodegenerative disorder, early diagnosis, brain signal analysis, cognitive decline, classification.

PID-217: Advancements and Comparative Analysis of Cyber Range Frameworks for Realistic Security Simulation

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Abstract: The rapid rise of cyber threats across civilian, industrial, and defense sectors has made cybersecurity training a global necessity. Traditional theoretical methods are insufficient for today's evolving attacks, leading to the growing importance of cyber ranges—virtual, controlled environments that simulate real-world networks for practicing attacks, defenses, and recovery. These ranges exist as open-source, licensed, or commercial systems, differing in cost, scalability, and realism. While open-source ranges support research and education, enterprise grade ones enable large-scale, high-fidelity simulations for national security. Evolving from static VM-based setups, modern cyber ranges now leverage AI, Infrastructure-as-Code (IaC), and container orchestration to create dynamic, automated, and realistic cybersecurity training environments. In this review, an extensive study was conducted by analyzing a wide range of existing literature, frameworks, and open implementations. The research compares their architectural foundations, virtualization technologies, automation methodologies, and adaptive intelligence capabilities. The outcomes of this study reveal that the integration of AI, machine learning, and IaC-based orchestration has significantly enhanced the realism, scalability, and reusability of cyber ranges. Furthermore, the study identifies key challenges, including interoperability, resource efficiency, and automation standardization, as areas for future exploration. Overall, this research establishes that cyber ranges represent the cornerstone of next-generation cybersecurity training, bridging the gap between academic learning, operational readiness, and national cyber resilience.

Keywords: Cyber Range, Attack Simulation, Virtualization, Infrastructure-as-Code (IaC), MITRE ATT&CK, Reinforcement Learning, Cybersecurity Training

PID-226: ANRM-SA: An Automated Rule-based Model for Noise Reduction in Multi-Modal Customer Feedback to enhance Sentiment Analysis in Product and Service Industries

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Abstract: Sentiment analysis is now a key part of making data-driven decisions in are-as like marketing, customer experience management, and social media monitoring. The accuracy of sentiment classification is frequently compromised by noise in unstructured data, including slang, abbreviations, emojis, misspellings, and extraneous textual content. This paper presents ANRM-SA (Automated Noise Reduction Model for Sentiment Analysis), a hybrid framework that combines the Automated Windows Task Scheduler (AWTF) with Rule-Based Filtering (RBF) to automatically preprocess and enhance input data prior to sentiment classification. The system uses the Windows Task Scheduler to automatically run Python scripts that collect, clean, and change sentiment data at regular intervals. In addition, rule-based heuristics is used to get rid of extra symbols, emojis, abbreviations, and URLs so that the text inputs for downstream classifiers are of high quality. Comparative experiments utilizing benchmark sentiment datasets indicate that ANRM-SA improves noise reduction accuracy by 1–12% compared to conventional pre-processing methods and markedly decreases preprocessing duration. The model therefore offers a smart, scalable, and automated way to make sentiment analysis results more accurate and reliable.

Keywords: Sentiment Analysis, Noise Reduction, Automated Windows Task Scheduler, Rule-Based Filtering, NLP Automation, Text Preprocessing.

PID-238: An Intelligent Deep Learning Based Strategy for Car Damage Detection

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Abstract: Car damage detection is crucial for current automotive industry and also for sales and repair departments, insurance company claim processing, car rentals and other related car services to avoid the existing manual inspections usually time-consuming, errorprone and inconsistent to maximum extent. Apart from systematic review to use various AI methods for damage detection under dynamic conditions required by different industries, this paper presents an efficient and accurate method that is based on Convolutional Neural Network (CNN) framework and other deep learning algorithms that Identifies and classify different types of broken parts of the cars including cracks, scratches and dents from a large set of car damage images. The applied CNN method used to train the dataset was found to minimize the manual errors by enhancing the functional efficiency along with supporting the various automotive sectors. Further this research would be useful for research community for developing robust solutions that operate effectively in real world circumstances based on AI vehicle damage assessment that can improve customer satisfaction in the automotive industry.

Keywords: Deep Learning, CNN, Image Classification, Car Damage Detection.

PID-239: MACHINE LEARNING APPROACH FOR PERSONALIZED MENTAL HEALTH TREATMENT AND DIAGNOSIS

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Abstract: In terms of mental health, our existing system frequently treats everyone equally. However, as everyone knows, what is effective for one individual may not be effective for another. The goal of my research is to address that. I'm investigating how machine learning, which is essentially teaching computers to recognize patterns, may be used to develop mental health services that are as individualized as you. Consider all the digital traces we leave behind every day: a smart watch monitors our heart rate and sleep patterns, our phone tracks our whereabouts, and our social media posts convey our emotions. In order to identify the early, subtle indicators of difficulties like depression or anxiety, my work uses sophisticated algorithms to sort through this data in addition to conventional surveys. It is comparable to providing doctors with a sophisticated early warning system. Early problem detection, however, is only half the fight. Determining the most effective technique to assist someone is the true objective. In order to provide individualized support, we are also developing systems. For instance, it could be a data-driven suggestion regarding the best kind of therapy or medication for your particular circumstance, or it could be a notice with a breathing exercise just when you need it. This high-tech future does raise some important questions, though. How do we keep everyone's personal information safe? How can we ensure that algorithms are impartial and do not unintentionally discriminate? And how can we make this technology something that therapists can genuinely rely on? My study focuses on finding solutions to these specific issues because the ultimate aim is obvious: to make mental healthcare not only more intelligent but also more customized, effective, and accessible to everyone.

Keywords: Deep Learning, CNN, Image Classification, Car Damage DetectionPersonalized Mental Health, Machine Learning, Predictive Diagnostics, Treatment Optimization, Precision Psychiatry, Clinical Decision Support.

PID-246: Trajectory optimization for single-channel high-speed drone based on hybrid FTEFC-NN control

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Abstract: This paper proposes an advanced method to enhance trajectory control performance for high-speed single-channel high-speed drone - a class of systems with high nonlinearity and complex dynamics. The proposed method focuses on integrating an Artificial Neural Network (ANN) into the structure of a Finite-Time Error Feedback Controller (FTEFC). This hybrid controller, denoted as Finite-Time Error Feedback Controller – Neural Network (FTEFC–NN), inherits the advantages of FTEFC in ensuring convergence time and finite-time stability, while leveraging the universal nonlinear function approximation capability of ANN to compensate for uncertain components and disturbances in the model. Initial simulation results show that, compared to the traditional FTEFC controller, FTEFC–NN demonstrates more accurate trajectory tracking, shorter transient time, and higher robustness against dynamic changes and disturbances, opening up a promising approach for high-speed drone trajectory optimization problems.

Keywords: Single-channel high-speed drone, Finite-time control , Articial neural network, Optimal trajectory tracking, Nonlinear systems.

PID-248: Adaptive Finite-time Sliding Mode Control for Nonlinear Systems under Uncertainties and Disturbances

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Abstract: To tackcle a class of nonlinear systems with uncertainties and disturbances, a sliding mode-based adaptive tracking controller is introduced in this paper. In the synthesis process, new adaptive sliding mode surface is employed to ensure the error goes to orniginal point in the finite-time. Then the equivalent and switching control law are designed to eliminate the influence of uncertainties and disturbances. The proposed control strategy ensures that the error signals converge within bounded compact regions around the origin, and all closed-loop signals remain uniformly bounded. Ultimately, the efficiency of the presented strategy is validated by an example of hydraulic system.

Keywords: Adaptive sliding surface; finite-time; uncertainties and disturbances.

ID-251: Healthcare AI: An Integrated AI Platform for Proactive Patient Care and Medical Data Management

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Abstract: Modern healthcare often struggles with patient information being scattered across different clinics and hospitals, leading to delays and inefficiencies. This paper introduces Healthcare.AI, a new platform that uses artificial intelligence to shift healthcare from a reactive model to a proactive, patient-focused one. The system combines a secure report management system, an AI-powered health risk assessment tool called "HeartGuard AI," and an interactive medical chatbot named "Health Guardian AI". Built using modern technologies like Next.js and Supabase, the platform brings together electronic health records, real-time vital signs, and medical reports into one intelligent health profile. It uses natural language processing to summarize complex medical reports and machine learning to predict risks for conditions like heart disease. This paper details the system's design, how it works, and its potential to enable early disease detection, reduce hospital visits, and improve the partnership between doctors and patients. We believe Healthcare.AI represents a significant step toward making advanced healthcare tools accessible and understandable for everyone.

Keywords: Artificial Intelligence, Healthcare, Patient Management, Predictive Analytics, Natural Language Processing, Telemedicine, EHR

PID-255: WEATHER EVENT CLASSIFICATION MODEL USING MACHINE LEARNING

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Abstract: Certain industries like agriculture, disaster management, and transport sectors require correct classification of different types of weather. Standard methods of weather forecasting using physical models along with numerical weather prediction (NWP) and models of real-time forecasting face problems of complex computations and real-time adaptability. This research explores machine learning (ML) methods aimed at swift and precise classification of weather occurrences using detailed meteorological data. In the study, various supervised learning techniques are assessed—along with the meteorological data of temperature, humidity, wind speed, and precipitation, models such as Decision Trees, Random Forests, Support Vector Machines (SVM), and Artificial Neural Networks (ANN) are evaluated against the data of atmospheric pressure. The design of the study includes model scoring with respect to data cleansing, feature extraction, and determination of hyperparameters within the model. There is sufficient evidence to support the fact ML models will not only adapt traditional methods with increased speed and dependability but also boost accuracy. The emphasis on feature design and data engineering indicates a means for improving classification. The proposed model has the potential for use with instant weather forecasting systems, providing real-time accurate predictions that aid in timely and informed decision making.

Keywords: Weather Classification, Machine Learning, Supervised Learning, Forecasting, Data Science.

PID-258: AI-Driven Automatic Modulation Classification: Leveraging Deep Learning and Machine Learning for Next-Generation Wireless Communication

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Abstract: This paper presents a comprehensive study of Artificial Intelligence (AI) and Machine Learning (ML) methodologies for Automatic Modulation Classification (AMC) in advanced wireless communication systems. As wireless networks evolve encompassing 5G/6G, IoT, and autonomous platforms the demand for intelligent, adaptive, and scalable signal recognition grows. Traditional AMC approaches, reliant on manual feature engineering and rigid statistical models, often falter in dynamic, noisy, and heterogeneous environments. This research investigates the transformative role of deep learning architectures, such as Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM) networks, which enable end to end learning directly from raw in phase and quadrature (I/Q) signal samples. These AI powered models demonstrate superior classification accuracy, robustness to channel impairments, and real time adaptability compared to classical methods. Critical challenges including model interpretability, data requirements, generalization across varying channel conditions, and adversarial robustness are addressed. The study highlights the integration of explainable AI techniques, few-shot learning for rapid adaptation, and energy efficient model design for deployment in resource constrained and mission critical applications. By advancing AI and ML driven AMC, this work contributes to the development of intelligent, resilient, and scalable wireless communication systems aligning with the core Computational Intelligence and Data Science for Digital Transformation.

Keywords: Automatic Modulation Classification, Deep Learning, Machine Learning, Wireless Communication, CNN, LSTM, Explainable AI, 5G, 6G, IoT

PID-262: A Review of Federated Learning Frameworks for Student Emotion Analytics and Support

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Abstract: The growing concerns of mental health among students has imposed the need for the development of effective emotion analytics frameworks. Traditional methods, such as surveys and manual observations, are often intrusive, sporadic, and inaccurate. Federated Learning (FL), a decentralized machine learning approach, offers a promising solution for emotion detection while preserving data privacy. This review paper explores the application of FL in student emotion analytics, highlighting its benefits, challenges, and future directions. We discuss various FL frameworks, emotion detection models, and evaluation metrics, providing a comprehensive overview of the current state-of-the-art. FL enables collaborative model training without centralizing raw data, ensuring data privacy and security. Emotion detection models can be trained on-device, using compact models and secure aggregation techniques. The review identifies potential applications of FL-based emotion detection in education, including early detection of mental health issues, personalized student support, and emotion-aware educational interventions. We also discuss challenges and open research questions, such as addressing data heterogeneity, ensuring model robustness, and developing scalable FL frameworks. This review aims to provide researchers and practitioners with a comprehensive understanding of FL-based emotion analytics, highlighting its potential to support students mental well-being and academic success. By addressing the unique challenges of student emotion analytics, FL can enable the development of effective, privacy-preserving solutions that support students emotional and academic needs.

Keywords: Federated Learning; Emotion Detection; Student Mental Health; Privacy Preservation; Decentralized Machine Learning; Educational Technology

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PID-268: Computational Fluid Dynamics-based Estimation of Hydrodynamic Coefficients for an Autonomous Underwater Vehicle

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Abstract: This study focuses on a numerical simulation approach for determining hydrodynamic coefficients in the dynamic modeling of autonomous underwater vehicles (AUVs). Comprehensive analyses are conducted on hydrostatic forces and moments, the effects of added mass, and the hydrodynamic behavior of the AUV hull, control surfaces, and propeller. Accurate estimation of hydrodynamic coefficients plays a crucial role in predicting the dynamic response of the AUV and ensuring control precision. To achieve this, Computational Fluid Dynamics (CFD) simulations are extensively employed to evaluate hydrodynamic parameters under various operating conditions. All CFD analyses are performed using ANSYS Fluent 2025 R1, where high-resolution meshes and appropriate turbulence models are applied to capture complex flow patterns and pressure distributions around the vehicle. The numerical simulation results are systematically validated against theoretical predictions derived from Hoerners empirical formulas (1985), demonstrating strong agreement in drag and lift characteristics. This validation confirms the reliability of the CFD-based modeling approach and provides a solid foundation for future control system design and optimization.

Keywords: Numerical simulation, Computational fluid dynamics, Autonomous Underwater Vehicle, Dynamic modeling, Hydrodynamic coefficients.

PID-272: Federated Learning for Privacy-Preserving Data Science in Distributed Environments

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Abstract: The databases of various scattered sources have grown exponentially, increasing the need for cooperative machine learning systems that would be efficient in total dataset across the federation and local optimization objective to users. The Federated Learning (FL) has become a groundbreaking paradigm that allows multiple devices or organizations to cooperate in the process of training the model without concentrating the data. The paper discusses how FL can be used in privacy-preserving data science on a stochastic gradient descent, Federated Averaging, global model optimization and handling non-IID data across the industries of healthcare, finance, and IoT. The proposed framework proves in terms of Differential Privacy (DP) and Secure Aggregation (SA) that it demonstrates large boosts in the data confidentiality, scalability in the computation process and model generalization in comparison to the homomorphic encryption principles. Practical limitations however exist like communication overhead challenges, heterogeneous data quality problems, susceptibility to inference attacks, etc. The paper wraps up with suggestions on how secure aggregation, differential privacy and blockchain can be more effectively implemented to local regularization and bandwidth-limited systems. The further work should be directed to finding adaptive aggregation algorithms, lightweight encryption, etc. to allow applying the mechanism of federated learning at scale in real-time.

Keywords: Federated Learning, Privacy-Preserving Data Science, Distributed Environments, Differential Privacy (DP), Secure Aggregation (SA), homomorphic encryption principles

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PID-281: Intelligent Nonsingular Terminal Sliding Mode Control for Industrial Robotic Manipulators Using Adaptive Wavelet Neural Networks

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Abstract: This paper proposes an intelligent nonsingular terminal sliding mode control scheme for industrial robotic manipulators, designed based on the wavelet neural network structure. To achieve high-precision trajectory tracking, adaptability, and robustness against system uncertainties, the nonlinear sliding mode controller is integrated with a wavelet neural network that performs online estimation of unmodeled nonlinearities, while a disturbance approximation module is incorporated to estimate external disturbances that cannot be directly measured. Adaptive update laws are developed to adjust the network weights and disturbance estimation signals in real time, effectively compensating for uncertainties without requiring prior system knowledge. The proposed control strategy ensures certain-time convergence, maintaining high tracking accuracy, adaptability, and robustness, while significantly reducing the chattering phenomenon inherent in conventional sliding mode control methods. Lyapunov stability analysis confirms the closed-loop stability, and simulation results on a three-degree-of-freedom industrial robotic manipulator demonstrate superior performance in

convergence speed, accuracy, and robustness, highlighting its potential for high-performance industrial automation applications.

Keywords: Nonsingular terminal sliding mode control, Industrial robotic manipulators, Wavelet neural networks.

PID-286: RAG-Driven Chatbot Design for Academic and Knowledge-Intensive Applications.

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Abstract:Recent breakthroughs in large pretrained language models have significantly advanced the state of the art for natural language understanding and generation; owever, most of these models rely on static internal parameters to represent knowledge, which leads to considerable limitations regarding updating factual knowledge, transparency of information, or providing verifiable sources for generated responses. This work proposes a Retrieval-Augmented Generation-based chatbot framework tailored for knowledge-intensive and academic applications. The proposed approach combines parametric memory-which is implemented through a pre-trained sequence-to-sequence generator model-with non-parametric memory through a dense document retriever accessing either external knowledge bases like Wikipedia or domain-specific datasets. At interaction time, given a user query, the retriever fetches dynamically the most relevant passages, while the generator synthesizes this retrieved knowledge into contextually rich, coherent, factually grounded responses. This hybrid architecture allows for real-time updates of knowledge, enhanced factual precision of responses, and significant hallucination and off-topic output reduction compared to traditional

transformer-only or seq2seq chatbots. Experimental evaluation and comparative analysis using baseline architectures show that the proposed RAG-based chatbot consistently outperforms them in terms of relevance, factual consistency, diversity, and explainability of responses, being a very effective solution for academic assistance, research support, and other knowledge-driven conversational applications.

Keywords: Retrieval-Augmented Generation, Chatbot, NLP, Knowledge-Intensive Tasks, Hybrid Architecture, Seq2Seq Models.

PID-287: Automating Ghibli-Style Production using GAN Synthesis and CNN Validation

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Abstract: The automation required by studios aiming at Ghibli-inspired imagery should keep the hand-crafted aesthetics and character identity while reducing repetitive work. This paper proposes a production-oriented framework that combines three synthesis routes with recognition-driven control: paired translation, which maps line art or layout keys to painted backgrounds when representative pairs exist; unpaired translation, which transfers photographs or 3D bases to watercolour-like palettes and soft edges when the pairs are scarce; style-modulated generation, which creates controllable character variants for visage and costume. The framework embeds a transfer-learned VGG16-based validator that provides class probabilities and attention maps for stylised characters. Recognition closes the loop by gating low-confidence outputs, a simple sequence measure, the Character Consistency Index, aggregates per-frame identity confidence over sliding windows to detect drift and trigger selective regeneration. A curated 1,500-image corpus supports training and evaluation. Image fidelity is assessed with SSIM and PSNR, recognition with accuracy and macro F1, and aesthetic coherence with expert

judgments. Two eSxemplar cases illustrate outcomes. Portraits preserve identity-defining cues such as Kiki's ribbon and San's facial markings, and receive high validator confidence. A multi-character forest scene maintains atmospheric depth, palette harmony, and clean compositing; the validator assigns high confidence to seven of eight characters and medium confidence to San under partial occlusion and off-frontal pose. Contributions include an integrated GAN plus CNN control loop for shot assembly, a lightweight sequence score for identity stability, and a replicable evaluation protocol. Results indicate that efficiency and expressive fidelity can be achieved together, and motivate future work on temporal or three-dimensional generators, emotion conditioning, and sequence-level metrics.

Keywords: Ghibli-style animation, Generative adversarial networks, Style transfer, Character recognition, Temporal coherence.

PID-288: Cognitive Knowledge Intelligence: Integrating Business Intelligence with AI-Driven Knowledge Management

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Abstract: Amid the fast-changing environment of digital business, the amalgamation of Artificial Intelligence (AI), Business intelligence (BI), and Knowledge Management (KM) has taken over to be the core of organizational competitiveness. In this paper, the author presents a novel concept of Cognitive Knowledge Intelligence (CKI) as a new paradigm combining cognitive computing, AI-based analytics, and knowledge systems to allow adaptive and data-informed decisions. The aim is to generalize existing studies on cognitive intelligence in BI-KM ecosystems, examine integration processes and define barriers to creating intelligent, explainable and human understandable analytics. The paper introduces a conceptual model of CKI focusing on machine learning, natural language processing, and cognitive reasoning as the key facets of enabling intelligence in the organization through a systematic review of

modern literature. Data heterogeneity, the lack of explainability in AI-based decision frameworks, and ethical issues in AI-based decision systems are the current limitations that are described in the study. Lastly it examines the possible applications in digital governance, education and business analytics and suggests future areas of research in order to develop explainable, interoperable and human-augmented knowledge systems in cognitive science.

Keywords: Cognitive Computing, Knowledge Intelligence, Artificial Intelligence, Business Intelligence, Knowledge Management, Analytics, Decision Support Systems.

PID-289: Beyond Speed: Green and Cost-Optimized Real-Time Analytics for the AI- Driven World

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Abstract: This paper introduces GCRTA which we put forth as a Green and Cost-Aware Real Time Analytics framework that brings together data science pipelines, big data streaming platforms and a edge cloud hybrid control layer to reduce energy use and operational cost at the same time as we preserve real time performance. In GCRTA we use predictive carbon and tariff information, adaptive work load scheduling, energy aware model choice and reinforcement learning based routing which we use to put computation where it is the most sustainable and cost effective. We have implemented GCRTA on a present day streaming architecture(Kafka Flink/Spark model serving) and we have evaluated it on we choose to represent from the field of IoT and telemetry. Also we report that as compared to a pure cloud based streaming approach GCRTA does in fact see consistent 20 34% reduction in operational cost and 18 28% in energy use which we see under we play out carbon intensity and tariff traces which are very much realistic also we see that we meet very strict latency SLAs. The modular design of the frameworks allows practical deployment of plug-in predictors and schedulers. We close with limitations on reproducibility and

future work which will focus on standardized benchmarks and the carbon-aware analytics.

Keywords: Green computing; carbon-aware scheduling; real-time analytics; edge-cloud hybrid; reinforcement learning; stream processing; big data; energy efficient model selection.

PID-294: Fuzzy Sliding Mode Control Based on Equivalent Control Integrated with Backstepping for Two-Wheeled Differential Drive Mobile Robots

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Abstract: This paper presents a robust Backstepping–Fuzzy Sliding Mode Control (BFSMC) scheme for two-wheeled differential-drive nonholonomic mobile robots subject to model uncertainties and external disturbances. An outer-loop backstepping kinematic controller is first designed to ensure convergence of pose tracking errors. In the dynamic loop, a fuzzy sliding mode controller based on the equivalent control principle is developed to enhance robustness while mitigating the chattering effect. The fuzzy inference mechanism adaptively blends the equivalent control with the switching term, enabling smooth control actions and im-proved disturbance rejection. Lyapunov-based analysis guarantees finite-time reachability of the sliding manifold and boundedness of the closed-loop signals. Simulation studies, including comparisons with PID, SMC, and DSC controllers, demonstrate that the proposed BFSMC strategy achieves superior trajectory-tracking accuracy, smoother control inputs, and stronger robustness against lumped

uncertainties. The proposed controller provides a practical and computationally efficient solution for reliable motion control of nonholonomic mobile robots operating in uncertain environments.

Keywords: Nonholonomic wheeled mobile robots, Fuzzy-backstepping control, Adaptive sliding mode control, Trajectory tracking, Hybrid control, Lyapunov stability.

PID-295: Comparative Evaluation of Transformer-Based Models for Question Answering

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Abstract: Developing accurate and efficient question answering (QA) systems remains a challenge in Natural Language Processing. In this work, we fine-tune five widely used pre-trained transformer models T5-base, BART-base, RoBERTa-base, ELECTRA-base, and DeBERTa-base for the QA task, enabling a comparative analysis of their architectures and performance. The models are evaluated on the Stanford Question Answering Dataset (SQuAD) using multiple metrics, including ROUGE, METEOR, MoverScore, BERTScore, SciBERTScore, Exact Match, and token-level F1, capturing both lexical and semantic aspects of the predicted answer. We also monitor memory and compute usage during fine-tuning to understand the resource requirements of each model. Additionally, human evaluation is conducted in two ways: via expert annotators and using ChatGPT as an automated judge, assessing answer accuracy and alignment with ground-truth answers. Our study highlights trade-offs between model performance, computational cost, and resource utilization, providing insights for building efficient, high-quality QA systems.

Keywords: Question Answering (QA), Pre-trained Language Models (PLMs), Transformer Models, Evaluation Metrics

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PID-306: Lumira — A Vertical Chatbot for Promoting Wau Burung and Cultural Heritage in Malaysia's International Higher Education

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Abstract. Traditional Malaysian kite; the Wau Burung is a highly cultural and is facing the danger of being forgotten, especially among the younger generations. Traditional games that were paramount of the cultural heritage of Malaysia are being overlooked in the contemporary society and cultural practices that were worth preserving are disappearing. This paper countered this obstacle by creating LUMIRA, an educational chatbot that will keep and encourage knowledge of Wau Burung, its history, rules and cultural significance. LUMIRA chatbot Created with web technology in the form of HTML, CSS, JavaScript, React, ASP.Net, SQL, and Entity Framework, the chatbot offers interactive digital platform to learners of higher education, especially those came from overseas to Malaysia. In contrast to the traditional information delivery, LUMIRA involves oral history, brief quizzes, and interactive conversation to provide a higher level of engagement. The Cultural Historical Activity Theory (CHAT), which conceptualizes the interplay between learners, cultural experts, and technology, informed this design. The usability and learning effect of the chatbot was assessed with the Chatbot UsabilityQuestionnaire (CUQ). Both local

and international students provided feedback that LUMIRA chatbot was user friendly, captivating and efficient in making cultural heritage closer and more relevant to the people. Overall, the study shows that the integration of culture with technology can redefine cultural activity. Having transferred Wau Burung to digital platforms, LUMIRA chatbot secures its future and sustainability to be enjoyed by both the current and future generations.

Keywords: Cultural Preservation, Cultural Heritage, Digital Engagement, Vertical Chatbot, Wau Burung, Higher Education.

PID-309: Artificial Intelligence in Precision Agriculture: A Review of Deep Learning Techniques for Crop Disease Diagnosis and Yield Optimization

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Abstract: Agricultural output often suffers due to plant illnesses, shifting weather patterns, or poor use of inputs. Because of this, smart farming increasingly relies on deep learning - not just for spotting diseases automatically but also for making choices based on evidence. While convolutional networks perform well in identifying sick leaves using drone images or multispectral scans, newer transformer systems do similarly good work - helping farmers act fast and protect harvests. Combining sky-based visuals with ground-level IoT sensors improves water timing, nutrient supply, and detection of environmental strain - thanks to joint analysis across data types. Still, putting these tools into practice faces hurdles: limited labeled examples, differences between test settings and actual farms, heavy computing needs, plus difficulty explaining results clearly to those who need them. This review brings together new developments in deep learning used for spotting crop diseases and improving yields, while also showing how different methods compare alongside existing gaps. Coming work could focus on broad farm-focused AI systems,

compact models suited for devices in the field, combining diverse data types, or tools that factor in weather patterns - aiming to support practical, eco-friendly farming at scale.

Keywords: Deep learning. Artificial intelligence, Agriculture, Crop disease detection, Precision agriculture, CNN, Machine learning, Smart farming.

PID-310: A Systematic Review on apple Disease Detection Using Machine Learning And Image Processing

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Abstract: Apple is the most important fruit regarding health and economic manner and amongst the widely produced fruits in the world. The apple diseases lead to significant economic loss to farmers. The manual apple disease detection is time consuming and expensive process. The manual disease detection is challenging to farmers as it requires an agricultural expert or experienced person to visit orchid then decide which disease is caused and usually the farmer visits to local pesticide shop, describe about what they have seen in orchid and then get the pesticides from chemist which sometimes are not correctly prescribed. So, Machine Learning (ML) and Deep Learning (DL) can be applied to detect apple diseases which will reduce cost and time. In this paper, we have studied various research articles, in which machine learning and

deep learning are used for the apple diseases detection. We explored different DL & ML models, frameworks, datasets, preprocessing techniques, and overall performance of the existing research works. A systematic analysis was performed on 28 research articles in between the years 2018-2024, to evaluate the recent development in apple disease detection using machine learning and deep learning. In this review, we have identified limitation of the datasets which affect generalization of the model. As concluding, the proposed models by researchers are not optimized for edge devices and prescription for treatment of diseases is not discussed.

Keywords: Machine Learning, Deep Learning, Apple Disease Detection, CNN, Image Processing

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PID-314: Machine Learning Based Prediction Of Mental Health Impacts From Irregular Habits In Nation Builders

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Abstract: Nation builders such as students, educators, and professionals often face demanding schedules that give rise to irregular habits, including disturbed sleep cycles, inconsistent work or study hours, poor dietary routines, excessive screen exposure, and reduced physical activity. These lifestyle irregularities significantly contribute to stress, anxiety, and deteriorating mental health, which, in turn, affect productivity and the broader process of national development. This study proposes a machine learning-based framework for predicting the mental health impacts of such irregular habits among nation builders. Multimodal data will be collected through surveys, self-reports, and digital activity logs to capture key behavioral indicators, such as sleep variability, work-hour irregularity, screen time patterns, and lifestyle volatility. Advanced machine learning models, including logistic regression, random forest, gradient boosting, and deep learning, will be applied to identify individuals at risk and uncover the most influential predictors of mental health decline. This study aims to establish quantitative relationships between

irregular habits and psychological well-being, while also building predictive models that enable the early detection of mental health risks. The outcome is envisioned as a scalable and interpretable system that can guide policymakers, educational institutions, and healthcare providers in designing effective interventions to support sustainable mental health practices among nation builders.

Keywords: machine learning, irregular lifestyle patterns, mental health, medical examination, physical activity, wearable sensor data, predictive risk modelling

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PID-315: Robust Skin Lesion Detection and Multi-Class Classification of Dermatological Images Through Deep Learning Techniques

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Abstract: A robust deep learning framework for the detection and multi-class classification of skin lesions in dermatological images is presented that addresses the growing need for rapid and reliable computer-aided diagnosis. The work utilizes a publicly available Kaggle dataset comprising six distinct categories – infectious skin condition, eczema, acne, pigment disorders, benign tumors and malignant tumors. These categories represent a diverse spectrum of dermatological abnormalities, thereby enabling comprehensive evaluation of the proposed model capability to differentiate between visually overlapping features. Two state-of-the-art deep learning architectures – MobileNet and Inception V3 were developed and trained using Google Collaboratory with python-based programming. Mobile Net known for its lightweight structure and efficiency, achieved an impressive accuracy of 97% demonstrating its suitability for real time resource constrained environments. Inception V3 designed for deeper hierarchical feature extractions achieved 93%, reaffirming its effectiveness in capturing complex lesion patterns despite in higher computational path. The experimental workflow included data preprocessing,

augmentation, model training, validation, and performance comparison across key metrics. Both models showed strong generalization ability, with MobileNet outperforming due to its optimized depthwise separable convolutions that enhance feature extraction while reducing computational load. The findings highlight that strategically selected deep learning architectures can significantly improve early detection and classification accuracy in dermatological imaging. Overall, this work underscores the potential of deep learning–driven frameworks to support dermatologists in diagnostic decision-making. The high accuracy levels achieved by the models illustrate their promise for integration into clinical support tools, mobile diagnostic platforms.

Keywords: Skin lesion, Mobile Net, Inception V3, Deep Learning.

PID: 317: A Hybrid Rule-Based Framework Toward Data-Driven Personalized Goal Recommendation for children with Intellectual Disability

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Abstract: This paper introduces a hybrid rule-based system aimed at providing data-driven, personalized goal recommendations for children with intellectual disabilities. It begins by normalizing diverse assessment results into a single Support Intensity Score (SIS), which indicates the child's dependency level

across various functional skills. Expert insights are integrated at two stages: domain-level criticality weights that reflect the importance of different life-skill areas for dignity, safety, and daily functioning, and Skill-level Global Baseline Priority scores, which factor in functional significance, safety, social participation, and task complexity. Child-specific urgency is then derived by combining the SIS with expert-assessed risk factors related to domain and age. The system calculates prioritized goals via weighted aggregation, resulting in separate plans for annual and quarterly interventions. The approach is fully transparent, preserves the integrity of standardized assessments, and does not require additional subjective input from caregivers. Additionally, by logging outcomes and goal progression over time, the framework facilitates future data-driven adjustments and learning-based improvements as longitudinal data accumulate available.

Keyword: Intellectual Disability, Rule-Based Recommendation, Individualized Education Planning, Assistive Technology, Special Education

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PID-322: Telemedicine in Bangladesh: A Star-Schema-Based Regional Tele-Health Solution

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Abstract: Telemedicine presents a pivotal solution for enhancing healthcare quality, accessibility, and affordability in developing countries like Bangladesh, where rural-urban disparities and resource limitations persist. Despite the emergence of low-cost hardware and mobile solutions for remote diagnosis, widespread and dependable adoption is continually challenged by the absence of robust architectural frameworks necessary to manage complex consultation workflows, ensure furnish actionable insights for strategic decision making. This research objective to construct a comprehensive Regional Telemedicine System Architecture, aimed at converting disparate transactional data into strategic analytical assets. The architecture is structured into four interconnected tiers, which are designed to support the complete lifecycle of a telemedicine system regionally, from acquisition through end-user delivery. The core of this system is a multidimensional, star-schema-based storage layer, intended for managing consultation data, provider profiles, and patient characteristics. The data model successfully facilitated clinical workflows and Online Analytical Processing (OLAP) functions, including ROLL-UP across temporal, geographic, and specialty dimensions. The comprehensive analytical dashboard serves as a basis for objectively assessing service utilization patterns, detecting healthcare inadequacies in regions, and monitoring remote quality of care demonstrated with synthetic data. These results illustrated that the dimensional data model provides the length and breadth, scalable, secure, and analytic requirements to move from pilot programs to support more sustainable, geographically extensive digital health services in the developing world.

Keywords: Telemedicine, e-Health, Star-Schema, Data Analytics, Database, Bangladesh

PID-323: Explainable Machine Learning Model for Intrusion Detection in Internet of Medical Things(IoMT)

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Abstract: The growing adoption of Internet of Medical Things (IoMT) devices has raised significant concerns regarding network security, particularly due to the sensitive nature of medical data. To address these challenges, this research proposes an explainable Intrusion Detection System (IDS) specifically designed for medical IoT networks. The system utilizes Grey Wolf Optimizer (GWO) for feature selection, machine learning models, particularly XGBoost and Random Forest, to accurately detect and classify network threats and SHAP (SHapley Additive explanations) for interpreting the prediction of the model. The system was evaluated using the WUSTL-EHMS-2020 dataset. When feature selection was performed using GWO, computational efficiency was improved without compromising detection performance. Experimental results demonstrate the system's exceptional performance, with XGBoost achieving 100% accuracy, precision, recall, F1 score, and 0% error rate for binary and multi-class classifications. Random Forest achieved 100% accuracy, precision, recall, and F1 score with 0% error rate for binary classification, and 99.97% accuracy and precision, 99.70% recall, 0.02% error rate, and 99.85% F1 score for multi-class classification. Model interpretability was further improved using SHAP (Shapley Additive Explanations), providing clear insights into feature contributions. The results highlight the system's robustness, efficiency, and suitability for practical application in medical IoT environments, where accuracy and interpretability are critical.

Keywords: Internet of Medical Things (IoMT), Intrusion Detection System (IDS), Explainable Artificial Intelligence (XAI), Random Forest, XGBoost, Grey Wolf Optimizer (GWO), WUSTL-EHMS-2020 dataset, SHAP

PID-324: Predicting Health Insurance Premiums Using Machine Learning: A Novel Regression Model

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Abstract: This paper presents a novel regression-based model designed to accurately forecast health insurance costs based on individual characteristics, bridging the gap between insurers and policyholders. Leveraging an artificial neural network (ANN), the model considers key factors, including age, gender, body mass index, number of dependents, smoking status, and geographic location, to predict premium costs with greater precision. Our approach demonstrates advancement over traditional methods, achieving a prediction accuracy of 99.78% in experimental trials. This high performance underscores the model's capability to provide tailored premium estima-tions, thus enhancing customer satisfaction by offering fair and data-driven pricing. Furthermore, the model demonstrates reliability across diverse input ranges, main-taining consistency even when exposed to high-risk demographic cases. This strengthens its value as a practical decision-support tool rather than just an academic experiment. The adaptability of the ANN also enables real-time premium forecasting, meaning insurance companies can integrate it into underwriting software to provide instant quotations. With continued improvement, this predictive system could con-tribute to pricing fairness, reduce manual processing cost, and enhance accessibility to medical coverage globally.

PID-325: Combination of compressed sensing MRI and deep-learning based classification for effective glioma brain tumor diagnoses

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Le Quy Don Technical University

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Abstract: Glioma represents one of the most common and clinically significant primary brain tumors, characterized by high morbidity and a wide spectrum of malignancy. Early and accurate detection is essential for effective treatment planning; however, current diagnostic workflows rely heavily on radiologists visually inspecting MRI scans. This manual interpretation is time-consuming, subject to inter-observer variability, and increasingly challenged by rising clinical workloads. Moreover, conventional MRI acquisition requires dense sampling of k-space, resulting in prolonged scan times and high computational demands. Long acquisition times not only reduce patient comfort but also increase the risk of motion artifacts and limit the throughput of disease diagnosis. Therefore, in this study, we propose an integrated framework that combines compressed sensing MRI (CS-MRI) with a deep learning–based classification network to enhance the efficiency and diagnostic utility of meningeal tumor detection in MRI. The CS-MRI enables under-sampled k-space acquisition while preserving diagnostic image quality, thereby reducing reconstruction time. The reconstructed images are subsequently processed by an optimal ResNet-18 network to automatically detect and classify glioma images. Our proposed classification model has obtained a promising accuracy of about 97.9% for 3.3x accelerated MRI acquisition and the recall and ROC analysis yields an AUC value are appropriately 1. These findings demonstrate

substantial potential for fast MRI scanning while ultimately improving diagnostic efficiency in glioma diagnoses.

Keywords: MRI, Compressive sensing, Glioma classification, MRI acceleration, ResNet-18.

PID-326: Design and Validation of a Deterministic and Revocable Biometric Template Protection System Using Chaotic Modulation and Error Correction

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Abstract: Biometric authentication is gaining greater involvement in AI-based computer vision systems, IoT devices, and large-scale surveil lance systems but these applications are fueling the risks related to pri vacy invasion, cross-matching, and identity fraud. In order to address the high security and reliability requirements of these settings, this paper presents: BioHasher a deterministic, revocable, non-invertible, biometric template protection scheme that is optimally suited to modern embedded and distributed security environments. BioHasher is a random projec tion, a chaotic algorithm consisting of modulation to make seed revoca bility, and error-correcting codes (ECC) to achieve strong matching when there is a sensor noise. The system has a median template-generation la tency of 6.6m microseconds when executed on heterogeneous microarchi tectures based on Trusted Execution Environments (TEEs) and shows high performance, with an Equal Error Rate (EER) of about approx imate 1 percentage. The use of deterministic arithmetic ensures cross platform reproducibility hence ensuring secure template computing in a variety

of edge devices. BioHasher is compatible with AI-driven biometric pipelines, resistance to inversion attacks, and unlinkability, which aligns cybersecurity and privacy demands in the emerging internet of things enabled surveillance and fraud-detection systems. Its design proves the fact that strong biometric protection is not incompatible with the com puting power of embedded systems in reality.

Keywords: Biometric Template Protection, Fuzzy Vault, Chaotic Map, Ran dom Projection, Determinism, Error Correcting Codes, Revocable Biometrics, TEE

PID-327: Storage-Aware Incremental Virtual Machine Placement in Heterogeneous Hypervisors Using Parallel ACO and Enhanced Firefly Metaheuristics

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Abstract: Virtual Machine Placement (VMP) is central to cloud data-center efficiency, yet many classical heuristics em phasize CPU and memory optimization while overlooking disk locality. This oversight leads to inefficient I/O performance, increased network traffic, and heavy virtual machine (VM) migrations as workloads evolve. Frequent migrations consume bandwidth and computational resources, causing performance degradation and higher operational costs. To address these challenges, this paper investigates VMP in heterogeneous clus ters running Proxmox and VMware ESXi and proposes two storage-aware, incremental metaheuristics: SA-PACO (Storage Aware Parallel Ant Colony Optimization) and E-ModFA (En hanced Modified Firefly Algorithm). The proposed methods introduce a two-phase incremental strategy to preserve existing VM placements, minimizing unnecessary live migrations while accommodating new workloads. Unlike traditional techniques, both

algorithms explicitly incorporate local-disk affinity into their objective functions, colocating VM storage with compute resources to reduce latency and improve bandwidth efficiency. The algorithms also leverage AVX2 vectorization and thread-level parallelism, enabling real-time decision-making for production scale deployments. We implement and validate these approaches within the Unified Hypervisor Management and Automation Interface (UHMAI) testbed, integrating cross-hypervisor orches tration, Terraform provisioning, Prometheus monitoring, and Grafana visualization. Experimental results show up to 17% reduction in energy consumption and 48% fewer live migrations compared to state-of-the-art baselines, while sustaining service level objectives. These results highlight the importance of storage aware, incremental optimization for heterogeneous cloud data centers.

Keywords: Virtual machine placement, ant colony optimiza tion, firefly algorithm, disk locality, heterogeneous hypervisor, energy efficiency, incremental optimization, cloud computing.

PID-329: Digitization of Analog Readings Using Computer Vision in a Sugar Mill in El Salvador

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Abstract: One of the challenges that companies currently face is deciding how to allocate the investments required for modernization. In this context, organizations must choose between acquiring new equipment or interconnecting existing assets to make them “digital”. This paper describes a solution implemented at a sugar mill in El Salvador to digitize measurements from analog instruments using computer vision, a Raspberry Pi–based tablet,

and Modbus functions. The proposed approach addresses the need to keep legacy equipment in operation when it remains technically functional and when a full "digital transformation" would be costly and/or secondary relative to the organization's broader technological transformation strategy.

Keywords: Computer vision; Modbus, automation, analog controller; communication, image processing, process control.

PID-330: Mobile Instrumentation System for Peroxide Measurement Using Reagent Strips

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Abstract. This paper investigates the feasibility of developing a mobile instrumentation system for hydrogen peroxide measurement using colorimetric reagent test strips. The proposed system leverages a smartphone as both the image acquisition and processing platform. The methodology comprises two main stages: (i) image capture via the smartphone camera, and (ii) image processing using Python and the OpenCV library. Experimental results demonstrate that the blue channel of the average RGB color extracted from the reagent pad exhibits a strong correlation with hydrogen peroxide concentration values. Furthermore, the consistency between visual evaluation and instrumental quantification is
confirmed by the obtained results, validating the system's potential for field deployment and low-cost analytical applications.

Keywords: Quality Assurance, Process Supervision, Product Quality Monitoring, SPC, Chemical Processes.

PID-335: A Safety-Aware Pathfinding Visualizer Using Intelligent Algorithms

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Abstract: This paper presents a safety-aware routing system that adds safety data where crime reports, street lighting, and police location helps to usual travel-time maps. Users set how safe they want the route to be; the algorithm then offers two lines on one screen that the fastest trip and the safer trip, with the seconds lost shown beside it. While the person walks, fresh data refresh the risk score so the phone can suggest a new turn if the chosen street darkens or an incident is reported. Tests with evening journeys show women and other vulnerable travellers reach home with measurably lower predicted risk and only small added minutes. By making safety a visible, adjustable part of city navigation, the tool supports equitable, trusted urban mobility.

Keywords: Safety-aware routing; vulnerable; street lighting; police location; real-time updates; mobility.

PID-336: ICT in Education: Effectiveness of Concept-Based Videos for Enhancing Learning Among CWSNs

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Abstract: The ASER-2023 report shows the urgent need for young children in elementary schools to build basic skills in reading and arithmetic. Many students struggle due to learning difficulties or emotional issues, but often remain unidentified as Children with Special Needs (CWSNs). Using screening checklists and appropriate assessments, followed by targeted support through ICT tools such as concept-based videos and visuals, can help meet their needs. A screening checklist has been developed by referring to existing tools, including the GLAD checklist, to identify learning difficulties in Mathematics and English. Experts have reviewed the tool and are now preparing it for pilot testing. The study will adopt an experimental design. Students with learning difficulties will be identified using a screening checklist. The selected group will receive ICT-based interventions, including concept-based videos and visuals. Pre-test and post-test assessments will be conducted to measure changes in their learning levels. This design aims to evaluate the impact of ICT tools on students who are having difficulty with Mathematics and English. By combining early screening with ICT-based support, the study aims to ensure that no child with learning difficulties remains unidentified or unsupported in foundational classrooms.

Keywords: ICT-enabled Learning, Children with Special Needs, Learning difficulties, Inclusive Education

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PID-337: The Transformative Role of Code in the Evolution of Modern Computing

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Abstract: Programming code represents the foundational element of computing systems and has been central to the continuous evolution of modern computing.

From early machine-level instructions to contemporary high-level programming environments, the progression of code has shaped how computing systems are designed, extended, and integrated across diverse domains. This study presents a conceptual overview of the evolution of programming code and its influence on the development of modern computing systems. The discussion traces key phases in the advancement of programming practices, reflecting the growing complexity of computing environments and the need for greater abstraction, modularity, and interoperability. Alongside traditional software development, the rapid growth of application programming interfaces (APIs) has significantly influenced how code is structured and reused in modern systems. APIs have enabled seamless communication between distributed services, accelerated application development, and supported large-scale digital ecosystems. The study further examines the role of programming code in the context of contemporary artificial intelligence systems. Modern AI applications increasingly rely on well-defined code structures and APIs to integrate learning models into real-world software environments. Emerging trends such as agentic artificial intelligence, where systems exhibit autonomous goal-oriented behavior, further highlight the evolving role of code in coordinating actions, decision flows, and system interactions. Additionally, the growing emphasis on explainable artificial intelligence underscores the importance of code in ensuring transparency, interpretability, and trust in intelligent systems. Rather than focusing on specific tools or methodologies, this study emphasizes the broader relationship between evolving coding practices and advances in computing technologies. By reviewing historical developments and current trends, the paper highlights how programming code continues to act as a transformative force, shaping the present landscape of computing and influencing its future direction.

Keywords: Programming Evolution, Computing Systems, Programming Languages, Software Development, Code Optimization, Digital Transformation.

PID-338: Enhancing Chronic Kidney Disease Prediction Using Advanced Deep Learning Techniques

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Abstract: CKD is a long-term and progressive illness causing heavy morbidity and death rates, representing a major worldwide health problem. Timely accurate forecasting of chronic kidney disease (CKD) is of great significance for suitable clinical action and efficient control of the disease. Despite the promising results of traditional machine learning in predicting CKD, feature engineering by hand and generalization of the model are common restrictions in this domain. The study introduces a deep learning predictive model for Chronic Kidney Disease, based on clinical and laboratory features. The recommended approach applies a multilayer deep neural network to independently identify complex, non-linear relationships in patient features, eliminating the need for significant feature engineering. Procedures such as normalization, handling of incomplete data, and class distribution modification are applied to improve the robustness of the model. The efficiency of the deep learning model is appraised with standard measures including accuracy, precision, recall, F1-score, and the ROC curve'sarea. Empirical evidence demonstrates improved prediction performance over classical machine learning classifiers of the proposed deep learning model, validating the ability of the model to discover non-linear correlations in medical data. Findings show that deep learning approaches can serve as an accurate decision support tool for early chronic kidney disease diagnosis, thus assisting health professionals to slow the development of the disease and to improve the health of the patients. Future work will focus on the incorporation of larger datasets and clustering and other explainable AItechniques for clinical interpretability.

Keywords: Chronic Kidney Disease, Deep Learning, Neural Networks, Medical Data Analytics, Disease

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PID-339: AI-Powered Attacks and Deepfakes: Threat Landscape, Techniques, and Defense Mechanisms

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Abstract: In recent years, advances in artificial intelligence (AI) have transformed both the defensive and offensive sides of cybersecurity. While AI has strengthened threat detection and automated incident response, it has also introduced new and more sophisticated avenues for cyberattacks. Among the most alarming developments are AI-driven intrusions and deepfake technologies, which have dramatically expanded the scale and precision of modern threats. This paper explores how attackers now employ AI for targeted phishing, automated system breaches, adaptive malware, and highly convincing social engineering campaigns. It also examines the rapid progress in deepfake generation, particularly through GANs and diffusion models, and discusses how these synthetic media tools are increasingly used for misinformation, identity fraud, financial exploitation, and even national security manipulation. In response to these challenges, the paper proposes a hybrid defense framework that integrates machine learning, digital forensic techniques, and regulatory measures. The study further provides experimental results and compares the effectiveness of current detection approaches to highlight remaining gaps and future research needs.

Keywords: AI attacks, deepfakes, generative adversarial networks, cybersecurity, misinformation, voice cloning, adversarial threats, threat detection.

PID-340: FitConnect A Smart Gym Finder and Management Application

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Abstract: The FitConnect application is innovative and interactive platform to bridge the gap between fitness enthusiasts and local gym facilities. The app enables user to easily locate gyms through geolocation services and GPS integration to identify nearby gym facilities and compare membership plans with exclusive discount and offers. Gym administrators can register their venues via a dedicated portal, streamline member registry through relational database entities, manage member records, and monitor daily activities through an integrated management system. Automate tasks like attendance tracking and payment processing. The application includes additional features like personalized diet plans, customized workout schedules, scientifically curated exercise suggestions tailored to user goals and body types. Users can also book a certified trainers for personalized session with calendar scheduling and virtual consultations, monitor and analyze their progress through performance tracking features via wearable device synchronization (e.g. heart rate, calorie burn and steps count) and to foster motivation elements the platform awards milestone-based achievement awards, badges and loyalty discounts upon reaching fitness milestones to enhance user retention. The platform integrates machine learning algorithms akin to KNN for predictive personalization, ensuring adaptive workout modifications and equipment availability for both user and administrator to create a seamless experience for managing membership data, scheduling, and promotional activities by combining fitness management, health guidance and business support into the platform. FitConnect strives to transform the way people engage with their fitness goals and local gyms services. This smart user centric solution fitness application contributes toward building a digitally empowered fitness system that promotes health, convenience and community engagement.

Keywords: Gym Locator, Member Management, Diet and Exercise Planner, Trainer Booking, Goal Achievement Rewards

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PID-341: Computational Intelligence for Detecting Socio-Behaviour in Children with Neurodevelopmental Disorder: A Systematic Review

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Pradeep Kumar
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Abstract: The rising prevalence of socio-behaviour characteristics in children affected with neurodevelopmental disorders necessitates accurate, scalable, and data-driven detection techniques. This systematic review analyzes recent developments in computational techniques, specifically machine learning and artificial intelligence, for the identification of conditions including autism spectrum disorder, attention-deficit hyperactivity disorder, and schizophrenia. Research published from 2014 to 2024 is examined concerning utilized data modalities, encompassing neuroimaging, behavioral sensing, speech analysis, and digital phenotyping. The review emphasizes a significant transition towards multimodal data integration, which consistently enhances detection performance compared to unimodal methods. Deep learning models exhibit superior accuracy; however, their application is infrequent due to inadequate performance on small, heterogeneous datasets, insufficient external validation, and increased complexity in interpretation. A notable disparity continues to exist between computational research and clinical application, driven by challenges related to generalizability, ethical data management, and algorithmic bias. Computational detection methods offer significant potential for early screening and diagnostic assistance. Future research should concentrate on extensive, heterogeneous datasets, explainable artificial intelligence frameworks validation to guarantee dependable clinical translation.

Keywords: neurodevelopmental disorder (NDD), autism spectrum disorder (ASD), attention-deficit hyperactivity disorder (ADHD), Deep Learning (DL)

PID-342: Multi-Objective Prediction and Optimization of WEDM Parameters Using Hybrid Statistical-ML Techniques

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Abstract: Wire electrical discharge machining (Wire EDM) to machine very hard-to-machine materials is dependent on the correct selection of process parameter settings to achieve the desired machining performance. The impact that selected Wire EDM process parameters will have on the resulting surface finish of the material being machined stainless steel, using a combination of the Taguchi L9 experimental design approach and machine learning-based predictive modelling capability. ANOVA testing indicate that peak current is the primary factor impacting surface roughness, while the pulse-on time has a moderate but not statistically significant impact on this surface finish. Both wire speed and the pulse-off time were found to have negligible effects on surface finish. Increasing the peak current and a longer pulse-on duration would increase the discharge energy resulting in increased crater depth on the surfaces, thereby increasing surface roughness value. To improve the predictive accuracy of our predictions, we developed and evaluated Random Forest (RF), Artificial Neural Network (ANN), and Support Vector Machine (SVM) machine learning models using both an 80% training 20% testing split and k-fold cross validation methods. Of these models, the RF produced the highest predictive accuracy followed by the ANN and SVM. By utilizing a combination of statistical analyses and machine learning, we are able to reduce the amount of experimental work needed to achieve the desired machine performance and increase machining accuracy, thus creating a roadmap for optimised Wire EDM operating settings, improved surface quality, and reduced machining defect levels. Future work will seek to further improve this methodology by investigating the benefits of combining real-time process control, hybrid optimisation methodologies, and deep learning methodologies within the Wire EDM machining process.

PID-343: CodeCure - "Alzheimer's Disease Detection Using Deep Learning"

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Abstract: Alzheimer's disease (AD) is a neurological disease that gets worse over time and affects millions of people around the world. Early detection is crucial for treatment planning and managing the progression of the disease. This project uses deep learning to automatically find AD in brain MRI data. We employed a combination of convolutional neural networks (CNNs) and transfer learning utilizing pre-trained models, VGG16 and ResNet, to enhance detection accuracy and reduce reliance on subjective visual assessments. The training and validation data comes from OASIS-3. To make the model rating improved, we use data pre-processing approaches similar to augmentation and normalization. Accuracy, precision, recall, and AUC-ROC are some of the most collective ways to measure performance. Also, we recommend a web-based system to make it easier for doctors and nurses to use. The project shows that AI-assisted diagnostic tools could be used to find Alzheimer's disease in its early stages. The system could also be used to find other neurodegenerative diseases.

Keywords: Alzheimer's Disease, Deep Learning, Machine Learning, Convolutional Neural Networks (CNNs), MRI Scans, Medical Imaging, Early Diagnosis, Transfer Learning, VGG16, ResNet, Neural Networks, AI in Healthcare.

PID-344: A Data-Driven Analysis of Student Satisfaction at MANUU

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Mohammad Arfeen
Maulana Azad National Urdu University, Hyderabad

Shadman Kausar
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Abstract: This research gives a quantitative measure of student satisfaction at Maulana Azad National Urdu University (MANUU). The goal of the study is evaluating how satisfied students have been with different academic and institutional aspects. The university students were given a survey that addressed important topics such academic facilities, course satisfaction, examination, campus facilities, hostel facilities, and job and placement satisfaction. Data was processed using Python, adjusted to a 0-1 scale, and analyzed using descriptive statistics and Pearson correlation. The results clearly indicate that there is a clear difference. In general, students are very satisfied with key academic aspects such as Academic Facilities with a mean of 0.72 and Course Satisfaction. Major strengths identified include support from the faculty, their availability, and fairness in grading. Descriptive statistics show that Job and Placement Satisfaction with a mean of 0.31, Hostel Facilities with a mean of 0.36, and Campus Facilities with a mean of 0.43 are the ones rated with the lowest average score. In addition, correlation analysis shows these low-scoring areas are the major determinants or contributors behind overall satisfaction. Accordingly, the strongest correlates in order of magnitude with overall student experience were reported by Job and Placement Satisfaction (r=0.95), Campus Facilities (r=0.85), and Hostel Facilities (r=0.85). This investigation found that though MANUU is doing well concerning its educational pursuits, it is important to emphasize developing placement

assistance, improving campus facilities, and hostel services to increase overall satisfaction among students significantly.

Keywords: Student Satisfaction, Higher Education, Data Analysis, MANUU, Academic Facilities, Placement, Campus Infrastructure, Correlation Analysis

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PID-345: Business Analytics for Organizational Decision-Making: A Conceptual Framework and Research-Oriented Synthesis

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Maryam Shadan
Maulana Azad National Urdu University, Hyderabad

Abstract: Organizations increasingly invest in business analytics to support data-driven decision-making; however, the translation of analytical insights into consistent, accountable, and effective organizational decisions remains uneven. Despite advances in analytics capabilities, many organizations continue to rely on fragmented information, intuition-driven judgment, or delayed insights, resulting in a persistent gap between analytical potential and decision impact. Existing research has extensively examined analytics tools, capabilities, maturity models, and performance outcomes, yet offers limited guidance on how analytics can be systematically embedded within organizational decision processes across strategic, tactical, and operational levels. This paper addresses this gap by proposing a conceptual framework for business analytics–driven organizational decision-making that shifts the analytical focus from technical sophistication to decision alignment and structural coherence. Adopting a conceptual and analytical research approach, the study synthesizes recent research on business analytics, decision support systems, governance, and organizational performance to develop a decision-centric framework that integrates decision layers, analytics reasoning, data relevance, governance constraints, and feedback mechanisms. The proposed framework conceptualizes analytics as a reasoning and support mechanism embedded within hierarchical decision contexts rather than as a standalone technical function. It emphasizes relevance-driven data structuring,

progressive analytical reasoning, explicit treatment of uncertainty, governance-embedded decision authority, and learning-oriented feedback loops. By doing so, the framework explains how analytics can support informed judgment while preserving managerial accountability and organizational trust. The primary contribution of this research lies in reframing business analytics as an organizational decision-support capability rather than a collection of tools or models. The framework provides a theoretically grounded yet adaptable structure applicable across industries and analytics maturity levels, without reliance on specific datasets or algorithms. This study offers a foundation for future research on analytics-driven decision-making and provides practitioners with a coherent blueprint for integrating analytics into organizational decision processes in a consistent, accountable, and sustainable manner.

Keywords: Business analytics; organizational decision-making; data-driven strategy; analytics framework; enterprise analytics; decision support systems

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PID-346: ClickSafe: A Machine Learning–Based Tool for Real-Time Scam Website Detection

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Shadan Women's College of Engineering and Technology

Maaz
Muffakham jah college of engineering and technology

Abstract: The rapid growth of internet usage has led to a significant increase in online scams and phishing websites, posing serious risks to users, especially those with limited technical knowledge. Many users unknowingly share personal or financial information by clicking on malicious links, as existing browser warnings are often insufficient or delayed. This project proposes ClickSafe, a machine learning–based tool for real-time detection of scam websites. The system allows users to paste a website URL and receive an instant verdict on whether the site is safe or suspicious. It uses a trained machine learning model to analyze URL characteristics such as structure, symbols, and domain patterns, along with Virus tool integration for reputation-based verification. A unique feature called Mirror Mode Simulation visually demonstrates how scammers may collect sensitive information, helping users

better understand online threats. ClickSafe is user-friendly and informative, and it aims to improve cybersecurity awareness and safer web browsing habits.

Keywords: Scam Website Detection, Phishing, Machine Learning, URL Analysis, Cyber Security, User Awareness

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TECHNICAL SESSIONS: PAPER PRESENTATIONS

मौलाना आज़ाद नेशनल उर्दू यूनिवर्सिटी مولانا آزاد نیشنل اُردو یونیورسٹی

MAULANA AZAD NATIONAL URDU UNIVERSITY

A Central University Under the Ministry of Education
Government of India

International Conference on Computational Intelligence, Data Science and Digital Transformations ICCIDSDT-2026

Track 1				
Venue: Seminar Hall				
Date & Time: 15 January 2026,				**02:00 PM - 05:00 PM**
Session Chair : Dr. Vijendar Solanki Associate Professor, Stanley College of Engineering				
Session Coordinator: Dr. Muqeem Ahmed				
S.No	**Time**	**Paper ID**	**Authors**	**Paper Title**
1	02:15 PM - 02:27 PM	66	Yasir Altaf Prof. Abdul Wahid	Integrating Outside Knowledge in Sign Language Understanding: A Visual Question Answering Approach
2	02:28 PM - 02:40 PM	75	Vivek Kumar Rajak Shubham Baranwal Anjeneya Swami Kare	Incremental Heuristic For Rumour Minimisation in Social Networks
3	02:41 PM - 02:53 PM	106	Munzir Bashir, Tawseef Ayoub Shaikh,	Dynamic False-Negative-Driven Loss Optimization for the Diagnosis of Parkinson's disease using Handwritten Data
4	02:54 PM -03:06 PM	171	Riyazuddin Khan, Dr. Muqeem Ahmed	Machine Learning Based Intrusion Detection System for Monitoring Attacks on Networks
5	03:07 PM - 03:19 PM	295	Tohida Rehman	Comparative Evaluation of Transformer-Based Models for Question Answering
6	03:20 PM - 03:32 PM	132	Gautami Pujare, Bharati Singh	Recent Advances in Maximum Power Point Tracking Techniques for Photovoltaic Energy Systems
7	03:33 PM - 03:45 PM	288	Sakthikarthikeyan R, Sudha R	Cognitive Knowledge Intelligence: Integrating Business Intelligence with AI-Driven Knowledge Management

मौलाना आज़ाद नेशनल उर्दू यूनिवर्सिटी مولانا آزاد نیشنل اُردو یونیورسٹی

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International Conference on Computational Intelligence, Data Science and Digital Transformations ICCIDSDT-2026

Track 2				
Venue: Conference Hall				
Date & Time: 15 January 2026, 05:00 PM				**02:00 PM -**
Session Chair: Dr. Jyoti Sharma, Asst. Professor, Chitkara Institute of Science & Technology**, Chitkara University, Punjab**				
Session Coordinator: Dr. Mohammad Omar				
S.No	**Time**	**Paper ID**	**Authors**	**Paper Title and**
1	02:15 PM - 02:27 PM	24	Anurag Kumar Rajak Amit Prakash	Bridging Heritage: A Deep Learning Model for Digitizing Ancient Kaithi Script
2	02:28 PM - 02:40 PM	289	Sangeetha S.B Thirumoorthi C	Beyond Speed: Green and Cost-Optimized Real-Time Analytics for the AI-Driven World
3	02:41 PM - 02:53 PM	41	Sambasiva V Dr. Shaik Jumlesha	DDoS attack detection and mitigation using bio inspired approaches: A Survey
4	02:54 PM -03:06 PM	74	Bhaskarjyoti Kherkatary	Feature Selection using a Modified Self-Adapting Dandelion Algorithm with Opposition-Based Initialization and Distance-Aware Seed Selection for Fraud Detection in Financial Transactions
5	03:07 PM - 03:19 PM	59	Mohana Sree Venkata Sai Krishna Narala, Nagmani Molakatala, Srinivasa Rao Battula	Medical Image Classification Using Meta Learning
6	03:20 PM - 03:32 PM	73	Sri darshan M, T Sugirtha	Edge-Efficient Image Dehazing with MobileViT Transformers.
7	03:33 PM - 03:45 PM	46	Taskeen Nasim Mohammad Islam	Predicting the Stress Level of Students Using Supervised Machine Learning and Artificial Neural Networks

मौलाना आज़ाद नेशनल उर्दू यूनिवर्सिटी مولانا آزاد نیشنل اُردو یونیورسٹی
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Track 3				
Venue: Digital Classroom 1				
Date & Time: 15 January 2026, PM				**02:00 PM - 05:00**
Session Chair : Dr. Maniza Hijab, Muffakham Jah College of Engineering & Technology				
Session Coordinator: Ms. Khaleda Afroaz				
S.No	**Time**	**Paper ID**	**Authors**	**Paper Title and**
1	02:15 PM - 02:27 PM	55	Mohammed Abdul Azeem	Enhancing Intrusion Detection Efficiency Using Hybrid Models Based on Convolutional Neural Networks (CNNs)
2	02:28 PM - 02:40 PM	60	1. Mahendra Sri Sai Karthik Desaboyina 2. Srikanth Yadav M	A Hybrid Approach for Fake Review Detection Based on Transformer Embeddings and Reviewer Behavior
3	02:41 PM - 02:53 PM	62	Veda Sri Krishna Priya Tamirisa	Smart Storage and Transportation for Agricultural Goods
4	02:54 PM -03:06 PM	69	Nikhil Teja Gurram	AI in DevOps is Reshaping Software Engineering Practices
5	03:07 PM - 03:19 PM	77	Kiran Kumar	Explainable Graph Neural Networks for Autism Classification: A Comprehensive Analysis of Brain Connectivity Patterns
6	03:20 PM - 03:32 PM	48	Zohra Khatoon Mohammad Islam	Analysis of Student's Stress using Machine Learning
7	03:33 PM - 03:45 PM	139	Md Gulzar Muqeem Ahmed	A Review on Advanced Digital Transformation in Health Services

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International Conference on Computational Intelligence, Data Science and Digital Transformations ICCIDSDT-2026

Track 4				
Venue: Seminar Hall				
Date & Time: 16 January 2026,				**10:00 AM - 12:30 PM**
Session Chair -Dr. G. Shree Devi B.S Abdur Rahman, Crescent Institute of Science & Technology, Chennai				
Session Coordinator: Dr. A. Satya Sai Kumar				
S.No	**Time**	**Paper ID**	**Authors**	**Paper Title and**
1	10:00 AM - 10:12 AM	85	1. Liza Glanisha Castelino 2. Praveen Kumar Myakala 3. Gavin Soares 4. Aliqyaan Mahimwala	Adaptive Algorithmic Fairness: A Reinforcement Learning Approach to Dynamic Bias Mitigation
2	10:13 AM - 10:25 AM	119	1. Suleman Mohammed 2. Steven Rossington 3. Abdul-lah Talari	AI-Enhanced Optimization of Alkaloid Extraction from Lupinus Luteus
3	10:26 AM - 10:38 AM	135	1. Syarifah Rahayu 2. Venkatesan K	Enhancing Blockchain Supply Chain Security Using Deep Learning for Threat Detection and Risk Mitigation
4	10:39 AM - 10:41 AM	149	1. Abdelkarim Taam 2. Amine Amar 3. Adil El Makrani	Digital Maturity Profiling in Higher Education: A Comparative Machine Learning Framework
5	10:42 AM - 10:55 AM	89	1. Rahul Karmakar 2. Sayan Pal 3. Mantu Dey 4. Samim Ikbal Manon 5. Debolina Ganguly 6.Jahangir Alam	Benchmarking Tree-Based Ensembles with LIME-Driven Insights: A Transparent Pipeline for Breast Cancer Diagnosis
6	10:56 AM – 11:06 AM	53	1. Mohammad Islam 2. Abdul Wahid	Ensemble Machine Learning on Multimodal EEG, Behavioral, and Demographic Data for Early Intellectual Disability Detection
7	11:07 AM – 11:19 AM	258	1. Mohammad Umar 2. Mohammad Rizwan	AI-Driven Automatic Modulation Classification: Leveraging Deep Learning and Machine Learning for Next-Generation Wireless Communication

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Track 5				
Venue: Conference Hall				
Date & Time: 15 January 2026, 2:00 PM – 5:00 PM				
Session Chair :Dr. Syarifah Bahiyah Rahayu, Director, Cyber Securty, National DefenseUniversity of Malaysia				
Session Coordinator: Prof. Syed Imtiyaz Hassan				
S.No	**Time**	**Paper ID**	**Authors**	**Paper Title and**
1	10:00 AM - 10:12 AM	226	Hemant Sethi Rajeev Gupta	ANRM-SA: An Automated Rule-based Model for Noise Reduction in Multi-Modal Customer Feedback to enhance Sentiment Analysis in Product and Servic Industries
2	10:13 AM - 10:25 AM	246	Pham Cong Tu Nguyen Vinh Tran Thuan Hoang	Trajectory optimization for single-channel high-speed drone based on hybrid FTEFC-NN control
3	10:26 AM - 10:38 AM	248	Du Phan	Adaptive Finite-time Sliding Mode Control for Nonlinear Systems under Uncertainties and Disturbances
4	10:39 AM - 10:41 AM	268	Nguyen Van Hoa Pham Van Tuan Nguyen Vinh	Computational Fluid Dynamics-based Estimation of Hydrodynamic Coefficients for an Autonomous Underwater Vehicle
5	10:42 AM - 10:55 AM	272	Veerendra Nath Jasthi	Federated Learning for Privacy-Preserving Data Science in Distributed Environments
6	10:56 AM – 11:06 AM	314	Md Ahmad Raza	Machine Learning Based Prediction Of Mental Health Impacts From Irregular Habits In Nation Builders
7	11:07 AM – 11:19 AM	322	Amreen Jahan, Dr. Pradeep Kumar, Geeta Pattun	A Review of Federated Learning Frameworks for Student Emotion Analytics and Support.

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Track 6				
Venue: Digital Classroom 2				
Date & Time: 15 January 2026, 02:00 PM - 05:00 PM				
Session Chair: Dr. Uma Dulhare, Professor, Dept.of Computer Science & Engineering				
Session Coordinator: Ms. T. Arundhathi				
S.No	**Time**	**Paper ID**	**Authors**	**Paper Title**
1	02:15 PM - 02:27 PM	281	Van Chuong Le, Dinh Tu Duong, Van Nam Dinh, Sy Phuong Ho, Van Du Phan	Intelligent Nonsingular Terminal Sliding Mode Control for Industrial Robotic Manipulators Using Adaptive Wavelet Neural Networks
2	02:28 PM - 02:40 PM	294	Ho Phuong,. Duong Dinh Tu, Le Van Chuong, Phan Van Du, Dinh Van Nam	Fuzzy Sliding Mode Control Based on Equivalent Control Integrated with Backstepping for Two-Wheeled Differential Drive Mobile Robots
3	02:41 PM - 02:53 PM	306	Moksud Mallik	Lumira — A Vertical Chatbot for Promoting Wau Burung and Cultural Heritage in Malaysia's International Higher Education
4	02:54 PM -03:06 PM	310	1.Gulfam Ahamad 2.Suhail Basheer 3.Sanjay Jamwal 4.Mohd Naseem 5.Kunwar Ateeq Khan	A Systematic Review on apple Disease Detection Using Machine Learning And Image Processing
5	03:07 PM - 03:19 PM	187	1.Thazhai Harivignesh P 2.Palanivel Rajan S Karthi 3.Nagappa M 4.Aakash S	Design of AI-Based Alzheimer's Disease Prediction Model Using EEG Signals
6	03:20 PM - 03:32 PM	287	Basil Hanafi, Mohammad Ali, Rajnesh Singh	Automating Ghibli-Style Production using GAN Synthesis and CNN Validation
7	03:33 PM - 03:45 PM	323	Umme Salma	ICT in Education: Effectiveness of Concept-Based Videos for Enhancing Learning Among CWSNs

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Track 7				
Venue: Digital Library				
Date & Time: 15 January 2026, 02:00 PM - 05:00 PM				
Session Chair: Dr. T V Vijay Kumar, School of Computer &SystemsScience, Jawaharlal Nehru University,New Delhi				
Session Coordinator: Ms. Geeta Pattun				
S.No	**Time**	**Paper ID**	**Authors**	**Paper Title and**
1	02:15 PM - 02:27 PM	173	Md Shahim Yawar Ali Ansari, Abdul Wahid, Fareeha Rasheed	DietaCare: A Hybrid Recommender for Economical, Clinically-Constrained, and Culturally-Relevant Nutrition in India
2	02:28 PM - 02:40 PM	161	Falak Tuba	Predictive Models for Coronary Artery Disease Detection using Machine Learning Algorithms
3	02:41 PM - 02:53 PM	238	Asfiya Siddiqui, Kahkashan Tabassum	An Intelligent Deep Learning Based Strategy for Car Damage Detection
4	02:54 PM -03:06 PM	251	Akshat Bhardwaj	Healthcare.AI: An Integrated Artificial Intelligence Platform for Proactive Patient Care and Medical Data Management.
5	03:07 PM - 03:19 PM	286	Gulshan Praween, Shabba Kausar, Mubashshrin Karimi, Md Nadeem Noori	RAG-Driven Chatbot Design for Academic and Knowledge-Intensive Applications.
6	03:33 PM - 03:45 PM	118	Md Asif Iqubal	Explainable AI For Personality Prediction.
7	03:33 PM - 03:45 PM	324	Saadullah Khan Abdul Riyan	The Transformative Role of Code in the Evolution of Modern Computing

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Track 8				
Venue: Digital Classroom 1				
Date & Time: 16 January 2026, 10:00 AM - 12:30 PM				
Session Chair: Prof. Sheo Kumar				
Session Coordinator: Mr. Mohammad Islam				
S.No	**Time**	**Paper ID**	**Authors**	**Paper Title**
1	10:00 AM - 10:12 AM	128	Sadaf Shaheen, Tunga Arundhathi	A Hemorrhagic Stroke Risk Prediction Using Machine Learning
2	10:13 AM - 10:25 AM	131	Meher Afrin, Samra Afzal, Syed Imtiyaz Hassan	Blockchain-Based Food Quantity Tracking System
3	10:26 AM - 10:38 AM	152	Shagufta Parween	Artificial intelligence-driven insights for proactive asthma attack prediction
4	10:39 AM - 10:41 AM	159	Zakir abbas	Machine Learning Approach For Personalized Mental Health Treatment And Diagnosis.
5	10:42 AM - 10:55 AM	164	Mohd Azeem	AI-Driven Predictive Models for Sustainable Development: Hourly Energy Consumption Forecasting
6	10:56 AM - 11:06 AM	165	Md Tauqeer Rehan	Federated Learning-Based Cyber Attack Detection in IoT Network
7	11:07 AM –11:19 AM	325	Jawad Fallah Rajabi	Enhancing Chronic Kidney Disease Prediction Using Advanced Deep Learning Techniques

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Track 9				
Venue: Digital Classroom 1				
Date & Time: 16 January 2026, 10:00 AM - 12:30 PM				
Session Chair: Prof. Nikhil Teja Gurram, HCL Technologies				
Session Coordinator: Dr. Fariha Rasheed				
S.No	**Time**	**Paper ID**	**Authors**	**Paper Title**
1.	10:13 AM - 10:25 AM	166	Alqama Naz	Predictive Analysis of Heart Disease Using Machine Learning Techniques
2.	10:26 AM - 10:38 AM	176	Zishan Akhtar	Methods Of Statistical Anomaly Detection And Clustering For Fraudulent Transactions In The Bitcoin Network.
3.	10:39 AM - 10:41 AM	177	Sabreen Koushar	Blockchain Based Authentication In Ehr To Ensure Security And Privacy
. 4.	10:42 AM - 10:55 AM	217	A Swechha Sonal Dr. Deepthi Vidyarthi Dr. Anil Gupta	Advancements and Comparative Analysis of Cyber Range Frameworks for Realistic Security Simulation
5.	10:56 AM - 11:06 AM	239	Md Sarwar Ahmad	Machine learning approach for personalized mental health treatment and diagnosis
6.	11:07 AM - 11:20 AM	255	Khalid Nasim	Weather event classification model using machine learning
7	11:07 AM –11:19 AM	327	Muhammed Muzzammil Mubeen, Mohamme Safiullah Shareef	FitConnect A Smart Gym Finder and Management Application
7	11:20 AM –11:32 AM	330	Mohommad Rashid, Dr. A.Satya Sai Kumar	CodeCure -"Alzheimer's Disease Detection Using Deep Learning".

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Track 10				
Venue: Digital Library				
Date & Time: 16 January 2026, 10:00 AM - 12:30 PM				
Session Chair: Dr. Jameel Ahamad, Assistant Professor, University of Bisha, KSA and MANUU Hyderabad				
Session Coordinator: Dr. Khalil Ahmad				
S.No	**Time**	**Paper ID**	**Authors**	**Paper Title**
1	10:13 AM - 10:25 AM	168	Shahana Sarwath	Securing The Remote Health Monitoring System Using Blockchain: A Survey Of Logging, Access Control And Emerging Trends
2	10:26 AM - 10:38 AM	309	Nahid Chaudhary Pradeep Kumar	Artificial Intelligence in Precision Agriculture: A Review of Deep Learning Techniques for Crop Disease Diagnosis and Yield Optimization
3	10:39 AM - 10:41 AM	117	Mohatesham Quadri	Opportunities and Challenges of Small and Large Language Models in Machine Translation: A Review
4	10:42 AM - 10:55 AM	262	Geeta Pattun, Pradeep Kumar	A Review Of Federated Learning Frameworks For Student Emotion Analytics And Support
5	10:56 AM - 11:06 AM	326	G. Shree Devi Afrah Fathima	AI-Powered Attacks and Deepfakes: Threat Landscape, Techniques, and Defense Mechanisms
6	11:07 AM - 11:20 AM	64	Pavankumar P, Satya Sai A, Ram Kumar Talasila, Riyaz Shaik, Lakshminarasimuham M R E, Sudha Nellore	Decentralized Multi-Agent Reinforcement Learning for Collective Transport
7	11:21 PM - 11:33 PM	315	Nusrath Fathima	Robust Skin Lesion Detection and Multi-Class Classification of Dermatological Images Through Deep Learning Techniques
8	11:34 AM –11:47 AM	329	Mohd Rafeeq, Saad Parvez	Multi-Objective Prediction and optimization of WEDM parameters using hybrid stastical-ml techniques.

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The following committee members have been nominated, and committees are constituted to ensure the smooth execution of work and other activities for the Upcoming International Conference on Computational Intelligence, Data Science, and Digital Transformations (ICCIDSDT-2026), which will be held on 15-16 January 2026. It is expected from each one to be deeply involved, contribute, and give their best to make the conference successful.

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Smart Accessible Resource and Tools for Holistic Inclusion, is a pioneering national initiative supported by the Ministry of Electronics and Information Technology, Government of India, and developed end to end by Maulana Azad National Urdu University, Hyderabad. Conceived as a technology enabled response to long standing gaps in learning, assessment, and home based support for Persons with Intellectual Disabilities, the project is creating a comprehensive digital ecosystem through the DivyangSarthi.in platform, supported by mobile applications and structured digital learning resources. By integrating animation, immersive Augmented Reality and Virtual Reality, and interactive digital modules, the initiative aims to make learning and daily skill development more accessible, engaging, and meaningful for diverse functional needs.

The project is envisaged and being developed under the leadership of Prof. Abdul Wahid, Dean, School of Technology, MANUU. Under his guidance, a multidisciplinary team of educators, therapists, technologists, and creative professionals has worked collaboratively to ensure that the platform is pedagogically sound, technically robust, and closely aligned with real life requirements. A core strength of Divyang Sarthi lies in its focus on empowering parents and caregivers, particularly in semi urban and rural areas, by enabling them to support structured learning and skill building at home when regular professional services are not easily available. Building on this validation, Divyang Sarthi progressed to the public beta launch of the DivyangSarthi.in platform, marking a significant milestone in translating vision into practice and expanding access to inclusive digital resources.

Divyang Sarthi has also received national recognition for its innovation and social impact. The project was honoured with an award presented by Shri Thawar Chand Gehlot ji, Hon'ble Governor of Karnataka, acknowledging its contribution to inclusive, technology enabled empowerment for persons with intellectual disabilities.



Divyang Sarthi's Project Manager Vashim Mazhar receiving an appreciation from Shri Thawar Chand Gehlot, Hon'ble Governor of Karnataka.

DIVYANG SARTHI

India has over 2.68 crore persons with disabilities, many of them still lack access to structured support, inclusive education, and professional guidance, especially in rural and underserved areas. Divyang-SARTHI is a unique comprehensive and assistive learning ecosystem designed to support individuals with intellectual and developmental disabilities across all stages of life through personalized education plans and expert-developed learning content. The platform, available through a web portal and mobile app, serves 18 stakeholder groups and provides all resources free of cost to ensure that inclusive and education is accessible to everyone. By combining technology, data-driven insights, and expert collaboration, Divyang-SARTHI is a platform that ensures a user-friendly and cognitively accessible experience, complemented by AR/VR-enabled interactive educational tools that empower learners, support families and professionals, and promote independent living, dignity, and meaningful participation.









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