Centurion University
Shaping Lives...
Empowering Communities...

Souvenir

1st International Conference
on
Machine Intelligence and Data Science
MIDAS - 2025

21st - 22nd March, 2025

Technically Co-Sponsored by

Springer

Organized by

Department of Computer Science & Engineering
School of Engineering & Technology

Centurion University of Technology and Management
Paralakhemundi-761211, Odisha, India

midasconf@cutm.ac.in

https://midas2024.cutm.ac.in/

1st International Conference

MIDAS

21st - 22nd March 2025

Centurion UNIVERSITY

Shaping Lives...
Empowering Communities...

Editors

Prof. Jagannath Padhy

Mr. Sambhav Barik

Organized by

Department of Computer Science Engineering

In Association with

Centurion University of Technology and Management, Odisha, India

Technically Co-Sponsored by

SPRINGER

Preface

In this era of unprecedented data proliferation, the confluence of Machine Intelligence and Data Science has emerged as a pivotal force, driving innovation across diverse domains. The 1st International Conference on Machine Intelligence and Data Science (MIDAS-2025), hosted by the Department of Computer science and Engineering, School of Engineering and Technology, Centurion University of Technology and Management, Paralakhemundi, Odisha, India, on March 21-22, 2025, in a dynamic hybrid format, stands as a testament to the growing significance of this synergistic field. MIDAS-2025 is meticulously designed to serve as a crucible for intellectual exchange, fostering a deeper understanding of the theoretical underpinnings and practical applications of Machine Intelligence and Data Science.

The conference's core objective is to provide a platform for researchers, practitioners, and industry experts to converge and deliberate on the latest advancements in the application of machine intelligent systems to data-centric challenges. In an era where data is the new currency, the ability to extract meaningful insights and develop intelligent solutions is paramount.

MIDAS-2025 transcends the traditional conference format, serving as a technical congregation where the latest theoretical and technological techniques in advanced computing are presented and scrutinized. The rigorous blind peer-review process, involving three expert reviewers, ensures that only high-quality research contributions are showcased. This commitment to academic excellence underscores the conference's dedication to advancing the frontiers of knowledge.

Furthermore, MIDAS-2025 aims to bridge the gap between academia and industry, fostering collaborative partnerships and facilitating the translation of research findings into practical applications. By bringing together experts from academic institutions, industries, research organizations, and professional engineering fields, the conference creates a vibrant ecosystem for the exchange of knowledge, expertise, and experience.
MIDAS-2025 is not merely a conference; it is a catalyst for innovation, a platform for collaboration, and a testament to the transformative power of machine intelligence and data science. We invite you to join us on this journey of discovery and contribute to the advancement of this vital field..

-Editors

About Centurion University of Technology and Management, Odisha

Centurion University of Technology and Management: A Pioneer in Skill-Integrated Higher Education
Centurion University of Technology and Management (CUTM) holds the distinction of being the first private university in Odisha, established through the CUTM Act 4 of the Odisha State Legislative Assembly in 2010. Over the years, it has emerged as a trailblazer in higher education, earning recognition as a Grade-A+ University by the National Assessment and Accreditation Council (NAAC) under the Ministry of HRD and attaining 12(B) status from the University Grants Commission (UGC). CUTM's commitment to academic excellence and skill development has positioned it as a cornerstone in shaping the higher education landscape in India.

The University's School of Vocational Education and Training has been designated as a Centre of Excellence by the Ministry of Skill Development and Entrepreneurship, Government of India. Additionally, its MSS School of Agriculture and School of Fisheries have been accredited by the Indian Council of Agricultural Research (ICAR), underscoring CUTM's focus on advancing agricultural and fisheries education. The University is widely celebrated for its innovative approach to integrating skill development into higher education, fostering employability, and promoting entrepreneurship.

CUTM's educational model is grounded in creating sustainable livelihoods, particularly in challenging geographies, through a combination of academic rigor and experiential learning. Its efforts have earned recognition from prestigious organizations, including UNESCO, the World Bank, and Niti Aayog, marking it as a unique institution in India. By emphasizing hands-on, practice-oriented, and community-centric education, CUTM has set a benchmark for institutions aiming to balance academic pursuits with practical application.
The University's distinctive approach to education is defined by its Skill Integrated and Employability-Linked Teaching and Learning Process. This methodology emphasizes partnerships with industries and communities, creating synergies that result in transformative learning outcomes. By focusing on real-world challenges and opportunities, the University equips its students with the knowledge and skills necessary to navigate and contribute to a rapidly evolving global workforce.

In addition to fostering academic and industrial collaborations, CUTM actively engages in creating and co-creating Nano, Mini, and Micro Enterprises. This unique initiative not only provides students with entrepreneurial opportunities but also integrates the local community into the educational ecosystem. The emphasis on creating scalable, replicable, and sustainable solutions has allowed CUTM to bridge the gap between theory and practice, thereby fostering innovation and action-oriented research.

The University's commitment to holistic education extends to building eco-systems that encompass its campuses, surrounding communities, industries, and other academic institutions. This integrated approach ensures that education is not confined to classrooms but is deeply interwoven with societal development. CUTM's focus on quantifiable outcomes and its community-centered innovations reflect its mission to create a transformative impact that transcends traditional educational paradigms. In doing so, the University has set a precedent for a future-ready education model that inspires and empowers generations to come.

About Department of Computer Science & Engineering

The Department of Computer Science and Engineering (CSE) is committed to excellence in education, research, and innovation. With a dynamic and industry-aligned curriculum, the department focuses on emerging fields such as Artificial Intelligence, Machine Learning, Cyber Security, Cloud Computing, AR/VR, Quantum Computing, and Game Development.

Academic collaborations with Unity, Unreal, AWS, Dassault Systèmes, and other industry leaders provide students with hands-on experience in cutting-edge technologies. Integrated industry certifications and research-driven learning empower graduates to become future-ready professionals, driving technological advancements across various domains.

Dr. Dhabaleswar Rao CH
Associate Professor and HOD

Prof. Debendra Maharana
Assistant Professor

Prof. Susanta Kumar Nayak
Assistant Professor

Prof. Saurya Ranjan Das
Assistant Professor

Prof. Jagannath Padhy
Assistant Professor

Dr. Abhishek Das
Assistant Professor

Prof. Manoj Kumar Padhi
Assistant Professor

Prof. Aryalopa Malla
Assistant Professor

Prof. Lipsa Priyadarshini Singh
Assistant Professor

Prof. Pragnya Das
Assistant Professor

Prof. Pranita Mohapatro
Assistant Professor

Prof. Sagarika Dash
Assistant Professor

Prof. Manswini Padhy
Assistant Professor

Prof.Biswaranjan Routray
Assistant Professor

Prof.Satyanarayan Sahu
Assistant Professor

Ms. Gayatri Swain
Teaching Associate

Mr. Debasish Bhola
Teaching Assistant

Mr.N Dibakar Choudhary
Teaching Assistant

Mr. Harendra Kumar
Teaching Assistant

Mr. Sambhav Barik
Project Manager

Message

Dear Esteemed Scholars, Innovators, and Thinkers,

It is both a privilege and a delight to welcome you to MIDAS 2025, hosted by Centurion University of Technology and Management. Conferences like this remind us why we chose the path of research, exploration, and discovery—because there is always more to learn, more to question, and more to create.

Data science and machine intelligence are not just transforming industries; they are redefining how we perceive knowledge itself. From data management to security, from visualization to the vast possibilities of AI, this conference is a meeting ground for those who push boundaries and challenge the status quo. The fact that every submission undergoes a rigorous blind peer review speaks volumes about the intellectual depth this forum seeks to cultivate.

Centurion University, with its NAAC 'A+' accreditation and recognition from global institutions like UNESCO and the World Bank, has always believed that learning should be lived, not just studied. Our approach is rooted in application, innovation, and real-world impact—values that align seamlessly with the objectives of MIDAS 2025. We are not just here to discuss theories; we are here to shape the future.

What makes a conference truly worthwhile is not just the research presented but the conversations sparked, the collaborations ignited, and the unexpected insights that arise in between. So, I encourage you—step beyond the slides and the structured sessions. Engage deeply, debate fearlessly, and let curiosity lead the way.

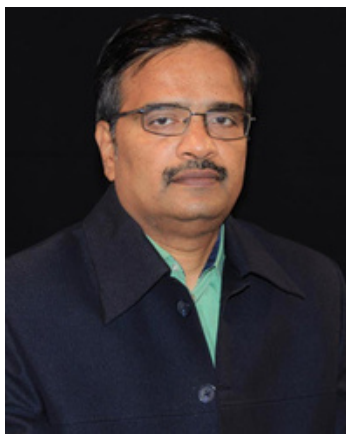
Thank you for being here, for contributing, and for bringing your expertise, passion, and unique perspectives. I look forward to the ideas that will emerge from these discussions and the impact they will have beyond these walls.

Let's make this a conference to remember.

Prof. Muktikanta Mishra

Prof. D. N. Rao
Vice President, CUTM

Centurion University of
Technology & Management,
Odisha, India



Message

Distinguished Delegates, Esteemed Colleagues, and Valued Participants,

It is with immense pleasure that I extend a warm welcome to the 1st International Conference on Machine Intelligence and Data Science (MIDAS-2025), hosted by the School of Engineering and Technology, Centurion University of Technology and Management, Paralakhemundi, Odisha, India, on March 21-22, 2025. This landmark event, conducted in a hybrid modality, signifies our commitment to fostering a global dialogue on the transformative potential of machine intelligence and data science.

In the contemporary landscape, the proliferation of data necessitates advanced computational paradigms for its effective utilization. MIDAS-2025 is meticulously designed to serve as a pivotal forum for the dissemination and discussion of cutting-edge research and technological advancements in the domain of machine intelligence as applied to data science.

Centurion University of Technology and Management is dedicated to promoting innovation and academic excellence. This conference reflects our unwavering commitment to facilitating the advancement of knowledge in critical technological domains. We believe that MIDAS-2025 will serve as a catalyst for collaborative research and technological development, fostering a vibrant ecosystem for the advancement of machine intelligence and data science.

I extend my sincere appreciation to the dedicated organizing committee whose meticulous planning and unwavering commitment have made this conference possible. Their tireless efforts have ensured a seamless and enriching experience for all participants. I wish MIDAS-2025 great success and look forward to the remarkable contributions it will bring to the academic and professional community.

Best wishes,

Prof. D. N. Rao

Prof.(Dr.) Supriya Pattanayak
Vice Chancellor, CUTM

Centurion University of
Technology & Management,
Odisha, India

Message

On behalf of Centurion University of Technology and Management, I am delighted to extend a warm and heartfelt welcome to the inaugural International Conference on Machine Intelligence and Data Science (MIDAS-2025),scheduled for March 21-22, 2025, in a hybrid format at the Centurion University of Technology and Management, Odisha, Paralakhemundi campus. This conference represents a pivotal moment in our university's commitment to fostering intellectual discourse and driving innovation in the critical fields of machine intelligence and data science. MIDAS-2025 will provide a collaborative platform for researchers, practitioners, and industry leaders to exchange insights, share best practices, and forge strategic partnerships. The rigorous peer-review process ensures the presentation of high-caliber research, contributing to the collective advancement of the field. I commend the exceptional dedication and meticulous planning demonstrated by the organizing committee, whose efforts have been instrumental in realizing this significant event. Their commitment to excellence has laid the foundation for a truly impactful conference.

Wishing MIDAS-2025 resounding success!

Prof.(Dr.) Supriya Pattanayak

Prof.(Dr.) Biswajit Mishra
Pro Vice Chancellor, CUTM

Centurion University of
Technology & Management,
Odisha, India

Message

It is my distinct privilege to extend a warm and enthusiastic welcome to the 1st International Conference on Machine Intelligence and Data Science (MIDAS-2025). This prestigious hybrid conference, scheduled for March 21-22, 2025, represents a pivotal forum for the critical examination and advancement of disciplines that are foundational to the contemporary technological paradigm. MIDAS-2025 will serve as a convergence point for experts to explore the intricate interplay between machine intelligence and data science, focusing on the development of sophisticated algorithms, robust architectures, and innovative methodologies that address the challenges of data-centric environments. We anticipate stimulating discussions on topics ranging from advanced computational intelligence techniques for pattern recognition and predictive modelling to the deployment of secure and scalable data management systems.

In an era where data-driven decision-making is paramount, the ability to extract meaningful insights and develop intelligent systems has never been more critical. MIDAS-2025 will serve as a premier venue for the dissemination of cutting-edge research, covering areas such as distributed machine learning, semantic data integration, and cryptographic techniques for data privacy. Special emphasis will also be placed on discussions surrounding data governance frameworks, quality assurance mechanisms, and the ethical considerations of deploying intelligent systems. A rigorous peer-review process ensures that the conference will showcase high-quality research, driving both theoretical advancements and practical innovations.

We anticipate that MIDAS-2025 will foster a dynamic exchange of ideas, facilitate interdisciplinary collaborations, and contribute significantly to the progress of machine intelligence and data science. I extend my sincere appreciation to the organizing committee for their meticulous planning and dedication in making this event a reality. We look forward to an intellectually enriching and rewarding experience for all participants.

Prof.(Dr.) Biswajit Mishra

Prof.(Dr.) Anita Patra
General Chair, MIDAS-2025
Registrar, CUTM

Centurion University of
Technology & Management,
Odisha, India

Message

I extend a cordial welcome to all participants of the 1st International Conference on Machine Intelligence and Data Science (MIDAS-2025). This conference, conducted in a hybrid format on March 21-22, 2025, represents a significant academic endeavour, designed to explore the confluence of machine intelligence and data science, disciplines that are fundamentally reshaping our technological landscape. MIDAS-2025 will serve as a critical platform for the dissemination of cutting-edge research, focusing on areas such as algorithmic optimization for data processing, cryptographic solutions for data security, and the development of robust architectures for large-scale data analytics. The conference will facilitate the exchange of scholarly insights and foster collaborative initiatives, essential for advancing these rapidly evolving fields.

The focus of MIDAS-2025 aligns with our university's commitment to promoting research and innovation in strategic technology domains. We recognize the imperative of developing advanced methodologies for data acquisition, integration, and analysis, as well as the need for robust frameworks to ensure data integrity and security. This conference will provide a forum for discussing critical aspects of machine intelligence applications, including the development of intelligent systems for data visualization, knowledge discovery, and predictive modelling. The robust peer-review process implemented for MIDAS-2025 ensures that the presented research adheres to the highest standards of academic rigor, contributing to the collective advancement of the field.

I commend the diligent efforts of the organizing committee, whose meticulous planning and execution have been instrumental in bringing this conference to fruition. Their dedication to creating a seamless and enriching experience for all participants is highly appreciated. We anticipate that MIDAS-2025 will serve as a catalyst for intellectual exchange and collaborative research, contributing to the development of innovative solutions that address the challenges of the data-driven paradigm.

Prof.(Dr.) Anita Patra

Prof. (Dr.) Mihir Narayan Mohanty
Guest & Keynote Speaker, MIDAS-2025
Professor, Institute of Technical Education and Research

Message

It's a true honor to stand before you as a keynote speaker at MIDAS 2025. This conference, dedicated to the exploration of machine intelligence in data science, arrives at a critical juncture. We are witnessing an unprecedented explosion of data, and the ability to extract meaningful insights from this deluge is becoming increasingly vital. The themes explored here—Data Management, Security, Analysis, and Visualization—are not just academic pursuits; they are the cornerstones of innovation across industries and disciplines. I'm excited to share my perspectives on the evolving landscape of data science and to engage in discussions that will shape its future trajectory. I believe that the collective expertise gathered here will play a significant role in addressing the challenges and opportunities that lie ahead.

In my keynote, I hope to offer insights that resonate with the diverse audience present, sparking new ideas and collaborations. I believe that conferences like MIDAS 2025 are essential for fostering a vibrant community of researchers and practitioners. The cross-pollination of ideas and the exchange of best practices are crucial for driving progress in this dynamic field. I look forward to engaging with you all and learning from your experiences.

This souvenir serves as a tangible reminder of the valuable connections and knowledge shared during MIDAS 2025. I hope that the insights you gain here will inspire you in your future endeavors. As we navigate the complexities of the data-driven world, it is crucial that we continue to push the boundaries of machine intelligence and data science. Let us embrace the challenges and opportunities that lie before us, and work together to create a future where data empowers us to make informed decisions and drive positive change. Thank you for the opportunity to be a part of this important event.

Prof. (Dr.) Mihir Narayan Mohanty

Prof. (Dr.) B. Ramkumar
Guest & Keynote Speaker, MIDAS-2025
Professor, IIT Bhubaneswar

Message

It is with great pleasure and enthusiasm that I extend my warmest greetings to all participants of the International Conference on Engineering and Technology, MIDAS 2025, hosted by Centurion University of Technology and Management, Paralakhemundi, Odisha, India.

I am deeply impressed by the focus of this conference on the critical and rapidly evolving field of machine intelligence in data science. The themes addressed – from the application of machine intelligent systems in Data Management and Quality Analysis to Data Security and Privacy, Big Data Analysis, and Data Visualization – are at the forefront of technological advancement and are crucial for addressing the challenges of our data-driven world.

The organization of MIDAS 2025, bringing together experts from academia, industry, and research organizations, demonstrates a commitment to fostering collaboration and knowledge exchange. Such platforms are vital for sharing the latest theoretical and technological techniques in advanced computing. The rigorous blind peer review process ensures the high quality of the presentations and contributes significantly to the advancement of our collective understanding.

I commend Centurion University of Technology and Management for providing this exceptional forum. The discussions and insights shared during this conference will undoubtedly inspire innovative solutions and drive progress in the field. I am confident that MIDAS 2025 will be a resounding success and a memorable experience for all attendees.

I wish all participants fruitful discussions and a productive conference. May the knowledge shared here pave the way for future breakthroughs and collaborations.

Prof. (Dr.) B. Ramkumar

Prof. (Dr.) Prafulla Kumar Panda
Organizing Chair, MIDAS-2025
Dean, SoET, Paralakhemundi

Centurion University of
Technology & Management,
Odisha, India

Message

Welcome to the 1st International Conference on "Machine Intelligence and Data Science (MIDAS-2025)," held in Hybrid mode at Centurion University of Technology and Management, Paralakhemundi, Odisha, India, March 21-22, 2025.

MIDAS-2025 is designed to be a pivotal platform for exploring the dynamic landscape of Machine Intelligence and Data Science. Our focus encompasses critical areas such as data management, security, big data analytics, and the innovative applications of these technologies. We believe that the convergence of these disciplines is essential for addressing the complex challenges of our data-driven world.

This conference aims to foster a strong collaborative environment, bringing together researchers, practitioners, and industry leaders. We are committed to facilitating the exchange of cutting-edge research, practical insights, and innovative solutions. By bridging the gap between academia and industry, we hope to accelerate the translation of theoretical advancements into real-world applications. A rigorous peer-review process, conducted by expert reviewers, ensures that all accepted papers meet the highest standards of quality and relevance. We are proud to present a program that showcases the latest developments and emerging trends in these rapidly evolving fields. Your participation contributes to the collective advancement of knowledge and the shaping of future directions.

I would like to take this opportunity to express my heartfelt gratitude to the esteemed keynote speakers and panellists who bring profound expertise and valuable perspectives to the conference. Gratitude to our organizing team and distinguished faculty for their tireless efforts in bringing this event to fruition. Sincere gratitude goes to the authors, reviewers and for their exceptional contributions. Also special thanks to the sponsors and partners for their steadfast support, which has been instrumental in bringing this conference to life. I am confident that MIDAS-2025will be a valuable and transformative experience for all participants, fostering innovation, collaboration, and inspiration.

Wishing you a deeply enriching and unforgettable conference experience!

Prof. (Dr.) Prafulla Kumar Panda

Message

It is my great honor and privilege to welcome you to MIDAS 2025, an international conference dedicated to exploring the frontiers of Machine Intelligence in Data Science. As we stand at the crossroads of rapid technological advancements, MIDAS 2025 serves as a platform for researchers, academicians, industry professionals, and innovators to exchange ideas, present pioneering research, and foster collaborations that will shape the future of data-driven intelligence.

This conference aims to illuminate the ever-evolving landscape of data management, security, mining, visualization, and big data analytics, ensuring that we harness the power of intelligent systems for meaningful and impactful applications. With esteemed speakers, insightful discussions, and groundbreaking research presentations, MIDAS 2025 is set to be a catalyst for new innovations in the field.

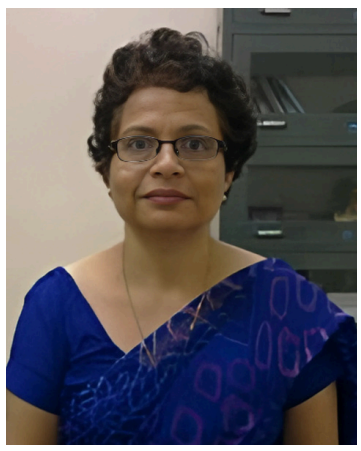
I extend my heartfelt gratitude to all the authors, reviewers, organizing committee members, and participants whose dedication and contributions have made this event possible. May this gathering be an enriching experience for all, sparking new ideas and collaborations that will drive progress in data science and machine intelligence.

Welcome to MIDAS 2025!

Dr. Ashish Ranjan Dash

Prof.(Dr.) Sujata Chakravarty
Organizing Chair, MIDAS-2025
Dean, SoET (BBSR)

Centurion University of
Technology & Management,
Odisha, India



Message

It is with great pleasure and honor that I welcome you all to the 1st International Springer Conference on Machine Intelligence and Data Science (MIDAS-2025). This conference serves as a dynamic platform for researchers, academicians, and industry experts to exchange ideas, present groundbreaking research, and explore the latest advancements in the fields of Artificial Intelligence, Machine Learning, and Data Science.

As we navigate the era of intelligent systems and data-driven innovations, this conference aims to foster collaboration, inspire innovation, and pave the way for transformative solutions that address real-world challenges. I extend my heartfelt gratitude to our distinguished speakers, dedicated researchers, esteemed reviewers, and organizing committee members for their relentless efforts in making this event a success.

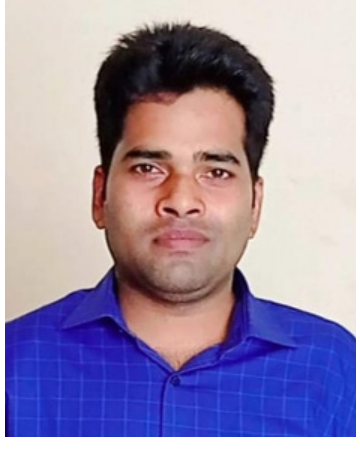
I hope MIDAS-2024 will be a valuable experience for all participants, sparking new collaborations and meaningful discussions.

Wishing you insightful sessions and a memorable conference!

Prof. (Dr.) Sujata Chakravarty

Dr. Abhishek Das
Programme Chair, MIDAS-2025

Centurion University of
Technology & Management,
Odisha, India



Message

As Programme Chair of MIDAS 2025, it is my distinct pleasure to welcome you to this pivotal International Conference. We've meticulously curated a programme that reflects the cutting-edge advancements in machine intelligence applied to data science, encompassing vital areas like Data Management, Security, Analysis, and Visualization. This conference is designed to be a vibrant forum for the exchange of ideas, fostering collaborations that will drive innovation in this rapidly evolving field. My vision for MIDAS 2025 has been to create a space where both established experts and emerging researchers can engage in meaningful dialogue, pushing the boundaries of what's possible in data-driven technologies.

The rigorous peer-review process, overseen by our esteemed panel of expert reviewers, ensures that the presentations and papers featured here represent the highest caliber of research. We encourage you to actively participate in the sessions, engage with the presenters, and take full advantage of the networking opportunities available.

This souvenir is a token of our appreciation for your participation in MIDAS 2025. It encapsulates the spirit of the conference and serves as a reminder of the valuable insights and connections you've made. I extend my sincere gratitude to the organizing committee, reviewers, speakers, and sponsors for their invaluable contributions. It is my hope that MIDAS 2025 will inspire new research directions, foster lasting collaborations, and ultimately contribute to the advancement of machine intelligence in data science. I wish you a stimulating and productive conference experience

Dr. Abhishek Das

Prof. (Dr.) Ashok Misra
CONVENOR, MIDAS-2025

Centurion University of
Technology & Management,
Odisha, India

Message

Welcome to MIDAS-2025!

It is with immense pleasure and pride that we host the 1st International Conference on Machine Intelligence and Data Science (MIDAS-2025). The event will be held from 21st to 22nd March 2025 at Centurion University of Technology and Management, Paralakhemundi Campus, Odisha, in a hybrid mode. This prestigious conference is technically co-sponsored by Springer.

MDAS-2025 provides an international platform for sharing knowledge on the latest research advancements and innovations in Intelligent Systems and Data Science Applications, along with related fields. We are honored to welcome the distinguished foreign delegates and invitees who will deliver state-of-the-art keynote addresses, enriching the conference experience.

This event serves as a unique platform for academicians, researchers, engineers, scholars, and industry professionals to come together, exchange knowledge, and foster innovation. The vibrant discussions, thought-provoking deliberations, and collaborative spirit aim to inspire new challenges and initiatives in your respective areas of expertise.

We are particularly proud of the exceptional quality of the papers selected for presentation. We are confident that the meticulously curated technical program will be both enjoyable and intellectually stimulating for all attendees.

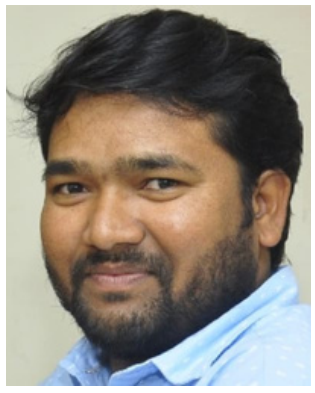
It gives us great pleasure to present this souvenir to the academic and research community. The included abstracts of the selected papers provide valuable insights and a roadmap for further exploration in your chosen domains.

Thank you for joining us at MIDAS-2025. We hope you have a memorable and enriching experience.

Prof. Ashok Mishra

Dr. Dhawaleswar Rao CH
HOD, CSE (PKD Campus)

Centurion University of
Technology & Management,
Odisha, India



Message

MIDAS 2025 is the inaugural International Conference on Machine Intelligence and Data Science, serving as a premier global platform for advancements in Intelligent Systems and Data Science Applications. This conference, hosted by Centurion University of Technology and Management, Paralakhemundi Campus, Odisha, will take place on March 21-22, 2025, in a hybrid format with technical co-sponsorship from Springer.

MIDAS 2025 provides an interactive space for researchers, academicians, industry professionals, and innovators to share insights, showcase cutting-edge research, and establish collaborations in machine intelligence and data-driven innovations. The conference places a strong emphasis on critical areas such as data management, security, mining, visualization, and big data analytics, aiming to leverage intelligent systems for transformative applications.

Eminent international delegates, keynote speakers, and leading experts will contribute their expertise through insightful discussions and pioneering research presentations. A meticulously designed technical program features high-quality research papers that offer valuable perspectives and guidance for future exploration in data science and artificial intelligence.

We express our heartfelt appreciation to the authors, reviewers, organizing committee, and participants for their commitment and contributions in making this event a success. MIDAS 2025 aspires to be more than just a conference—it aims to be a driving force for innovation, collaboration, and academic excellence in Machine Intelligence and Data Science.

Dr. Dhawaleswar Rao

CONTENTS

CONTENTS

CONTENTS

TRACK-1
INTELLIGENT SYSTEMS

Organized by Department of Computer Science and Engineering

Sentiment Analysis of Text Data for Hate Speech Detection

Simranjeet Kaur1 and Jayshree Kundargi2

Somaiya Vidyavihar University, K.J. Somaiya College of Engineering,

Vidyavihar, Mumbai, Maharashtra 400077, India.

1simranjeet.k@somaiya.edu

2jmkundargi@somiya.edu

Abstract

Social networking services are dominant in todays' era and are utilized by billions of people to manifest their point of view on various topics. Since every coin has two sides these social networking platforms are also being used to spread hatred towards a targeted group of people. Since monitoring only through human supervision is time intensive, Machine Learning models can simplify the process by classifying the data with help of models. Hate Speech detection consists of binary classification of data into 'hate' or 'non-hate'. The various state of art models and techniques were studied during the literature survey and it was found that majority work was conducted using Deep Learning Models. In this paper various classical machine learning models and deep learning models are tested on five benchmark English language datasets. Among the five datasets 'HateCheck' dataset is a synthetic dataset and the remaining datasets consist of text data obtained from various social networking platforms. Here, the commonly used Bag of Words (BoW) and Word2Vec word representation techniques have been utilized for classical machine learning and deep learning models respectively. The impact of hyper-parameter tuning using five-fold cross validation technique has been explored on classical machine learning models. All the models are evaluated using the F1-Score performance evaluation metric. The deep learning models that were applied to the datasets are CNN, LSTM and BiLSTM. The F1-Score metric is used as a performance evaluation metric and the algorithms were optimized to ensure minimum value of false positive and true negative. The classical and deep learning models were evaluated using the F1-Score and the results obtained were compared with the state-of-the-art.

Keywords: sentiment analysis, hate speech, classical machine learning models, deep learning models.

Enhanced Face Emotion Detection Using Confidence-Based Sample Filtering

K Vipul Arya, Karthik KV , Billa Muralidhar and Sangamesh Ramesh
School of Computer Science Engineering (SOCSE) RV University, RV Vidyanikethan Post 8th Mile, Mysuru Road, Bengaluru – 560059

Abstract

This research presents a method for improving the detection of emotions by utilizing confidence-based sample filtering and a carefully crafted convolutional neural network (CNN) structure. By combining data from datasets like FER2013, AffectNet, and CK+ and standardizing them through preprocessing this study creates three datasets; complete data, high-confidence data, and low-confidence data. Each dataset is trained on a customized CNN model achieving accuracy rates of 73.3 percent, 76.3 percent, and 71.3 percent for the dataset high-confidence dataset and low-confidence dataset respectively. The CNN architecture includes pooling layers with dropout regularization to enhance generalization. The practical application of real-time emotion detection using webcam input is demonstrated in this study. This research emphasizes the importance of dataset filtering and model design in advancing facial emotion recognition systems for real-world applications.

Keywords: Convolutional Neural Network, t-SNE, Object Recognition.

Lung Infection Detection using VGG19 Model for Smart Healthcare

Mihir Narayan Mohanty
Applied Signal Processing Laboratory
ITER, Siksha 'O' Anusandhan (Deemed to be University)
Bhubaneswar, Odisha, India.
mihirmohanty@soa.ac.in

Abstract

Lung infection may cause the diseases related to this particular organ including fever, tumor, Tuberculosis and cancer. The work presents a novel optimized model for detection of lung infection from CT images, aiming to provide timely and accessible healthcare solutions. IoT devices capture lung CT images from the patients. VGG-19 model, a category of deep learning based neural network, for lung infection detection through transfer learning is utilized in this work. The model is further optimized for deployment on scalable platforms, including IoT devices. The uploaded images are processed using pre-trained VGG19 CNN models to detect and localize areas of infection. It is the advance CNN model with pre trained layers that analyses the lung images in terms of shape, color and structure. Further Transfer learning is utilized in this model to reduce the computational cost for new problems. For faster conversion during training, Adam optimizer is used. Results based on the web application interface, allowing healthcare professionals to visualize and interpret the findings. The proposed results show the performance of accuracy is approximately 98.33% and verified for different lung diseases to prove its robustness.

Keywords – Lung infection, Lung CT, Machine Learning, VGG Net, IoMT.

Unmasking Synthetic Speech: A PCA-Based Approach to Differentiating Human and AI-Generated Voices

Bishnupriya Panda1, M Disha2, Seema Gupta Bhol3, Ambika Prasad Mishra4

1,2,3School of Computer Applications, 4School of Computer Science and Engineering,
Kalinga Institute of Industrial Technology, Bhubaneswar, Odisha.
1 bishnupriyapanda.fca@kiit.ac.in2. manvidisha0803@gmail.com
3 seemaguptabhol.fca@kiit.ac.in4 ambikaprasad.mishrafcs@kiit.ac.in

Abstract

Voice replication using AI, a cutting-edge development in machine learning, enables the creation of convincingly natural artificial voices. This technology has wide-ranging applications, from enhancing entertainment and educational content to improving accessibility for those with disabilities. However, it also carries risks: malicious actors could exploit it for identity fraud, financial scams, or compromising security measures. A key challenge lies in the difficulty of distinguishing AI-generated voices from genuine human speech, particularly in voice-based authentication systems. Modern AI algorithms can produce highly accurate voice imitations, even replicating subtle aspects like emotional inflections and regional accents. To tackle this issue, we need to create advanced detection methods that can reliably differentiate between authentic human speech and AI-synthesized voices. Such systems would bolster security measures and help counter the potential misuse of voice cloning technology. This research explores the complexities and potential dangers linked to AI-based voice replication and puts forward a novel approach for accurately identifying whether a voice is human or artificially generated. Our study examines both human and AI-generated voice samples in principal component analysis (PCA) space to identify key distinguishing features. We created a balanced dataset comprising 1000 human voice samples from LibriVox and 1000 AI-generated samples using Coqui AI text-to-speech technology. Each sample was standardized to a 10-second duration using Pydub. We then employed the Sound Synthesis Toolbox V1.7 to analyze these samples across 1264 parameters. To manage this high-dimensional data, we applied PCA to reduce the number of dimensions while retaining essential information. The insights gained from this analysis could contribute to the development of safeguards against the malicious exploitation of voice cloning technology.

Key words: PCA, Synthetic Voice, Voice Spoofing, Marginal Statistics, Modulation power

Performance Comparison of Pneumonia Disease Detection and Prediction using Deep Learning Models

Haymanot Derebe Bizuneh1, Demissie Jobir Gelmecha1 , Ram Sewak Singh1, Satyasis Mishra2, Eshetu Tessema1 , Workeneh Geleta1

1Department of Electronics and Communication Engineering,Adama Science and Technology University, Adama, Ethiopia

2Dept. of ECE, Centurion University of Technology and Management, India

Abstract

Medical image analysis requires an intelligence-based model due to pneumonia disease infecting the lungs and killing many people worldwide. The detection and prediction of pneumonia diseases are the focus of numerous studies necessary to compare the performance of deep learning models and use appropriate models for a specific field of study. The objective is to analyze the performance of models for detecting and predicting pneumonia disease in grayscale images. These selected deep learning models are CNN, VGG16, VGG19, DenseNet, ResNet, and inception models. The deep learning model performance is analyzed through Anaconda Python Jupiter notebook and tensor flows. Therefore, the CNN model has a high performance at 97.78%, the ResNet model has a low performance of 62.22%, and the remaining models are moderate. However, the selection of models depends on the specific field of study.

Keywords: Pneumonia Disease, Detection and Prediction Model, Deep Learning

Robust Security for IoT-based Wireless Sensor Networks Using Weighted CNN based AZOA

Uma Maheswari V1,Rajanikanth Aluvalu2,
Suresh Salendra3, Swapna Mudrakola4,andSudheer Reddy K5
1Chaitanya Bharathi Institute of Technology
umamaheswari@ieee.org
2 Symbiosis Institute of Technology, Hyderabad Campus, Symbiosis International University, Pune, India
rajanikanth.aluvalu@ieee.org
3 Balaji Institute of Technology and Science
sureshsalendra@gmail.com
4Aurora University
Swapna0801@gmail.com
5Anurag University
sudheercse@gmail.com

Abstract

Wireless Sensor Networks (WSNs) are integral to various human activities, particularly in critical applications such as intrusion detection and monitoring in contested regions and military bases. This study presents a novel approach to rapid intrusion detection using a Weighted Convolutional Neural Network (WCNN) enhanced by the American Zebra Optimization Algorithm (AZOA). WCNN employs weighted features to improve the identification of attacks such as Blackhole, Grayhole, Flooding, and Scheduling, while AZOA optimizes network parameters for enhanced accuracy and faster convergence. Experimental results demonstrate the effectiveness of this approach, yielding high detection rates, improved accuracy, and reduced false positive rates compared to traditional methods. This integration not only fortifies the security framework of Internet of Things (IoT)-based WSNs but also offers a scalable solution for large-scale deployments. This study introduces a novel approach combining a WCNN with the AZOA for intrusion detection in IoT-based WSNs. The use of WCNN enhances anomaly detection through feature weighting, improving the identification of sophisticated attacks like Blackhole, Grayhole, Flooding, and Scheduling. The findings underscore the potential of combining advanced neural network techniques with adaptive optimization algorithms to enhance the security and reliability of IoT networks, paving the way for further research and development in this critical area.

Keywords: AZOZ, WSNs, WCNN, IoT, Blackhole, Gray hole attacks

Improving Deep Learning Reliability in Edge Networks Using Parallelism Techniques

Dr. S. Vijayanand1, S Jerald Nirmal Kumar 2, Ravindra Raman Cholla 3, P.Mariappan4, Muthaiah U5

1,2,3, School of CSE, Jain Deemed to be University, Bangalore, India. 562112
4Department of CSE, Velalar college of Engg. and Technology,Erode,Tamilnadu.
5Department of CSE, Amrita Vishwa Vidyapeetham Chennai, Tamil Nadu, India.
1profvijayanand84@gmail.com, 2 jeraldcse@gmail.com, 3raman1179@gmail.com
4 mariappancse@gmail.com, 5 u muthaiah@ch.amrita.edu

Abstract

With reference to the above problem formulation, this paper aims at presenting advanced parallelism methodologies aimed at increasing the robustness of deep learning models that are deployed across edge networks. With such applications constituting the primary use of edge computing for real-time applications such as autonomous vehicles and IoT, the stability and robustness of deep learning in the network edges are pivotal. Nevertheless, edge environments are typically characterized by computational resource scarcity and variability, for fault tolerance is crucial for continual functioning and accurate inference. To overcome these issues, we study data and model parallelism as two potential approaches for enhancing deep learning dependability over edge networks. Data parallelism, where data are divided across the different devices, lowers the probability of failures in single points while improving speed. Model parallelism, at the same time, splits the neural network model across these multiple devices to guarantee that, even if certain parts do fail, work can proceed while data loss is kept to a minimum. These parallelism techniques allow edge networks to operate stably in changing network conditions and always achieve high model performance and data reliability. Using real data analysis, we show that by integrating parallelism techniques, there can be marked enhancements covering the fault tolerance, latencies before which the application should complete and hence reliability can be highly enhanced in deep learning models deployed at the edge

Keywords: distributed computing, artificial intelligence, reliability, concurrency, data concurrency, model concurrency, real-time, neural networks, low latency processing, edge artificial intelligence, resource optimization

Analyzing And Recognizing A Pretender's Acoustic System By Leveraging Of Novel Approach

B. Swaminathan1, and Yenigabala Bharath Reddy2
Department of Computer Science and Engineering1, swamikb@gmail.com, Department of Forensic Science2,
Jain Deemed-to-be University, Bengaluru. bharathreddy8371@gmail.com

Abstract

Vocal mimicry is the imitation of someone else's character in speech; this includes the kind of vocabulary, tone, accent, and body language used and is also called voice imitation or voice impersonation. Impressionist ability can be an art, an amusement, or it very well may be a profession. It's a pretty common practice; I'm assuming it's for nefarious reasons. Voice mimicking poses a challenge to the security areas where voice recognition is used, forensics areas. The biggest obstacles for speaker recognition systems are fraudsters, who almost perfectly mimic the true speaker sounds. To check whether a voice has been forged is something important. Different techniques can be employed to carry out perceptual comparisons of the acoustics of the samples performed to determine the true physical characteristics of the loudspeaker. A new level of crime, making use of voice samples to invoke kidnapping and online scamming. Through analysis, one can distinguish between mimicking or impersonating vocal samples via the methods present.

Keywords: RNN and LSTM algorithms, speaker identification, audio characteristics, and impersonated or mimicked audio samples.

Crop Recommendations and Decision Support Systems

Sreenivasa Rao Kakumanu1, Sivakumar Gowda Katta2, D V V Bramhachari3,
G.Kusuma Harinadh4, lokaiah pullagura5*

1 Assistant Professor, Department of CSE-AIML&IOT, VNR vignana jyothi institute of engineering and technology, Hyderabad, India- Email: cnu.kakumanu@gmail.com

2 Assistant Professor, Department of CSE, Sreenidhi Institute of Science and Technology, Hyderabad. Email: sivakumar.k@sreenidhi.edu.in

3Assistant Professor, Department of CSE, Universal College of engineering and technology, Dokiparru, Guntur. Email: db.achari72@gmail.com

4Assistant Professor, Dept of CSE, Universal College of engineering and technology, Dokiparru, Guntur. Email: gkhari03@gmail.com

*5Associate Professor, Department of CSE, Jain University, Bangalore, Karnataka, India Email: lokaiah75@gmail.com

Abstract

Agriculture is vitally essential for all human beings because it offers food safety and economic peace to the world. With technological improvements, Machine Learning (ML) has emerged as a possible tool for crop ideas based on numerous natural factors, such as soil makeup, temperature, humidity, rainfall, and pH levels. The present research offers an AI-Powered Crop Evaluation and Support System for Decision Making that uses Support Vector Machine classification (SVM), Random Forest (RF), Logistic Regression (LR), and decision tree (DT) algorithms to offer producers the most appropriate crop choices for their area. This technology gets information from farmers about natural traits and tells them which plants to grow. The system was tried on different crops and the traits that are common to them. Using the formulas' findings, crop ideas that would work in each place were come up with. With an accuracy of 96.3%, the SVM algorithm showed that it was very good at what it did. Based on the weather, this method helps farmers make smart choices about when to gather their crops, which increases efficiency and productivity while lowering the risk of crop loss. The suggested AI-powered field recommendation and decision-help system utilizes the SVM, RF, LR, and DT algorithms. Because it changes the foods that farms grow, they become more eco-friendly and make more money. These ideas could help farms get bigger and safer, which would improve food security and the economy.

Keywords: AI-powered crop Request, Decision Support System, SVM, RF, DT, LR.

Brain Stroke Detection and Classification using FRFCM Segmentation and classification using SVM and Random Forest methods

1Naresh Kanungo, 2Satyasis Mishra*, 3Sandipan Pine, 4P A Sunny Dayal, , 5Katleho Moloi

1,2,3 Dept. of ECE,Centurion University of Technology and Management ,Odisha, India
naresh.kanungo@cutm.ac.in,s.mishra@cutm.ac.in, sandipan@cutm.ac.in

4Dept. of ECE, Centurion University of Technology and Management, Andhra Pradesh, India
sunnydayal@cutmap.ac.in

5Dept. of Electrical Power Engineering ,Durban University of Technology, South Africa
KatlehoM@dut.ac.za

Abstract

Stroke is a major global cause of mortality and disability, and prompt and precise diagnosis is essential for successful treatment. The classification of brain strokes is crucial in differentiating between stroke kinds, such as ischemic and hemorrhagic strokes, which necessitate very different medical treatments. Using clinical characteristics, patient demographics, and medical imaging data, this study suggests a machine learning-based method for classifying brain strokes and an FCM-based segmenting algorithm for detecting the strokes. At the first stage, the images are pre-processed and aligned as input to the segmentation technique. An FRFCM segmentation technique was proposed to detect strokes. The segmented images are fed as input to the Support vector machines (SVM) and Random forest to classify the strokes from the images. The brain stroke images are collected from the Kaggle dataset for this research. The proposed FRFCM segmentation achieved an accuracy of 99.11%, and the random forest achieved 98.88% classification accuracy. The comparison results for segmentation and classifications are presented.

Keywords: Fuzzy c means, FRFCM, SVM, Random Forest, Brain Stroke.

Epileptic Seizure Detection Using Hybrid Transformer and Capsule Networks

Priya Das1, Sarita Nanda1 and Ganapati Panda2
1School of Electronics Engineering, Kalinga Institute of Industrial Technology, Bhubaneswar, India
das.priya258@gmail.com, snandafet@kiit.ac.in
2School of Electronics Engineering, C. V. Raman Global University, Bhubaneswar, India,
ganapati.panda@gmail.com

Abstract

Epilepsy is a common neurological condition defined by recurring, unprovoked seizures that affect millions of people worldwide. Accurate and timely detection of seizures is essential for improving the quality of life of epileptic patients and developing of responsive neurostimulation treatments. This paper presents a novel epileptic seizure detection model based on a hybrid architecture combining a Transformer and a Capsule Network (Transformer-CapsNet), trained and tested using the CHB-MIT scalp EEG dataset. The proposed Transformer-CapsNet model is evaluated against two widely used architectures: Convolutional Neural Network (CNN) and Long Short-Term Memory Network (LSTM). The performance of the suggested model is assessed using multiple metrics, including G-Mean, recall, precision, and F1-score. The experimental results indicate that the Transformer-CapsNet model surpasses conventional CNN and LSTM models in G-Mean, precision, and robustness, offering valuable insights into seizure detection using EEG data.

Keywords: Transformer network, Capsule network, Convolutional Neural Network, Long Short-Term Memory Network, EEG Signal, CHB-MIT dataset, Deep Learning.

PCOS Prediction from Medical Imaging Data: Analyzing CNN Deep Learning models Comparatively using Elastic Deformation

Lalit Kumar Behera1 and Satya Narayan Tripathy2
1 Centurion University of Technology and Management, Bhubaneswar, INDIA
2 Berhampur University, Berhampur, INDIA

Abstract

Polycystic Ovary Syndrome (PCOS) is an endocrine system-related health issue that poses significant health challenges for females of reproductive age, necessitating early and accurate prediction and treatment. This study con- ducts an analysis of two prominent Convolutional Neural Networks (CNNs): Efficientnet and Xception comparatively for predicting PCOS from medical im- aging data. Leveraging the strengths of each architecture, we aim to assess their efficacy in image classification tasks. To enhance model performance and ro- bustness, we implement advanced image data augmentation techniques, specifi- cally elastic deformation, which increases the variability of training images and helps prevent overfitting. Evaluation metrics include confusion matrix, accura- cy and loss, Receiver Operating Characteristic curve and performance report. Results show the performance of the Efficientnet and Xception models compar- atively, highlighting their strengths and weaknesses in diagnosing PCOS. The findings aim to support the development of more reliable diagnostic tools that can enhance clinical outcomes for women with PCOS.

Keywords: Deep Learning, Image Data Augmentation, Elastic Deformation, CNN, PCOS

MrmrXgBr: A Machine Learning Model for Breast Cancer Identification using Next-generation Sequencing Data

Arpita Priyadarshini1, Ashis Kumar Ratha2, Sushree Sasmita Dash3, Pabani Mahanta4,
Rakesh Pandey5, Debasish Swapnesh Kumar Nayak6,
1Department of Statistics, Utkal University, Bhubaneswar, India-751004.
2Department of Computing and Security, School of Computer Science and Engineering, IILM University, UP, India-201306.
3Department of AI & DS, IIMT College of Engineering, Greater Noida, India-201310.
4Department of Statistics, Utkal University, Bhubaneswar, India-751004.
5School of Computer Science and Engineering, IILM University, Greater Noida, Uttar Pradesh, India-201306.
6Department of Computer Science and Engineering, Centurion University of Technology and Management, Bhubaneswar,India752050.
1pri.arpita@gmail.com, 2ashisratha@gmail.com, 3sasmitadash83@gmail.com, 4pabani6568@gmail.com, 5vi.rakesh2002@gmail.com, 6debasish.nayak@cutm.ac.in

Abstract

The advent of artificial intelligence (AI) has brought about a significant transformation in breast cancer (BC) prediction, resulting in faster and more precise identification of cancer. Gene expression (GE) data plays a crucial role in identifying biomarkers, classifying molecular subtypes, predicting therapy responses, and uncovering therapeutic targets, all of which contribute to tailoring treatment approaches. Next-generation sequencing (NGS) outperforms microarray gene expression (GE) analysis by providing superior resolution, comprehensive assessment, and improved accuracy, thereby boosting the evaluation of risk, selection of medication, and prediction of prognosis. This research examines different machine learning (ML) methods for identifying breast cancer using NGS-GE data, with a specific emphasis on minimum redundancy and maximum relevance (MRMR) for selecting features. The proposed MrmrXgBr model utilizes three widely-used ML algorithms: eXtreme gradient boosting (XGBoost), support vector machine (SVM), and random forest (RF). The selection of these algorithms was based on their strong classification performance, capability to handle data with a large number of dimensions, ability to evaluate feature importance, and capacity to identify intricate connections in GE datasets. The experimental findings showcase our proposed MrmrXgBr model's efficacy, with an impressive 96% accuracy in classification, 100% sensitivity, and 97% F1-score. These findings highlight the significance of accurate feature selection in improving the efficacy of ML models for BC detection. This research greatly enhances the application of advanced ML techniques and efficient feature engineering in creating more robust and effective tools for identifying BC. As a result, it improves patient outcomes and assists in making therapeutic decisions.

Keywords: Artificial intelligence, Machine learning, Feature engineering, Next-generation sequencing, Cancer diagnosis, Breast cancer.

A Comparative Analysis of Transformer Models for Abstractive Summarization of Indian Legal Judgments

G S Mahalakshmi, Surendra Kumar C, Sendhikumar S
gsmaha@annauniv.edu, surendrakumar.c2003@gmail.com, sskumar2k@gmail.com
Anna University, Guindy, Chennai, India 600025

Abstract

Abstractive summarization of judicial decisions presents issues due to sophisticated legal terminology, contextual complexities, and diverse document architectures. This research compares three major transformer models—T5 (Text-to-Text Transfer Transformer), LED (Longformer Encoder-Decoder), and ProphetNet—based on their ability to provide short and useful summaries of legal texts. This study performed extensive trials on a dataset of Landmark Judicial Judgments by the Supreme Court of India and their accompanying Summaries, evaluating each model based on metrics like ROUGE scores, semantic coherence, and summary relevance. The findings from this study show that, while T5 and ProphetNet perform well in broad text summary tasks, the LED model excels both in handling lengthy legal documents, preserving contextual integrity, and creating summaries that adhere to legal requirements. This study highlights the superiority of LEDs.

Keywords: Longformer Encoder-Decoders, T5, ProphetNet

Machine Learning Models and FOREX Analysis: USD-INR Exchange Rate Prediction for Very Short-Term Period

Suman Gulia
Maharishi Markandeshwar (Deemed to be University)
sumanpunia3011@gmail.com
Kamaljeet Kaur
(Maharishi Markandeshwar Deemed to be University)
kamaljeet.kaur@mmumullana.org
Merry Saxena
Department of Interdisciplinary Courses in Engineering,
Chitkara University Institute of Engineering & Technology, Chitkara University, Punjab, India
merry.saxena@chitkara.edu.in
Amit Vajpayee
Parul Institute of Engineering and Technology,
Parul University, Vadodara, Gujarat, India
er.amitvajpayee@gmail.com
Pradeepta Kumar Sarangi
Chitkara University School of Engineering and Technology
Chitkara University, Himachal Pradesh
pradeeptasarangi@gmail.com
Alok Kumar Agrawal
Chitkara University School of Engineering and Technology
Chitkara University, Himachal Pradesh
alok.agrawal@chitkarauniversity.edu.in

Abstract

The foreign exchange market, where currencies from around the globe are traded, allows traders to buy and sell various currencies. Known as forex, this sector of finance offers the potential for substantial profits, but it also comes with considerable risks. The market is relatively straightforward, as traders can earn money by predicting the movements of currency exchange rates. However, the foreign currency market poses challenges for forecasting due to its volatile, unpredictable, and chaotic nature. Developing a reliable model that can capture existing trends while adapting to ever-changing market conditions is difficult. Recently, researchers worldwide have focused on studying the foreign exchange (FOREX) market. Due to its intricate nature, many studies have been undertaken to predict future FOREX currency prices with precision. In this work, an experiment has been done with the currency conversion data (INR-USD). Two ML models have been implemented primarily RNN and LSTM. The RNN model gave an accuracy of 99.80%, while the accuracy by the LSTM model has been reported as 99.93%.

Keywords— Currency exchange, RNN model, LSTM model, Machine Learning

Enhanced Machine Learning Techniques for Projection of Kidney Disease

Gagan Sharma
Chitkara University College of Nursing, Chitkara University,
Himachal Pradesh, India
gagan.sharma1987@yahoo.com
Baibaswata Mohapatra
Department of Electronics and Communication Engineering,
Greater Noida Institute of Technology (Eng. Institute), Greater Noida, U.P., India
writetobm@gmail.com
Merry Saxena
Department of Interdisciplinary Courses in Engineering,
Chitkara University Institute of Engineering & Technology, Chitkara University, Punjab, India
merry.saxena@chitkara.edu.in
Anshu Sharma
Chitkara University School of Engineering and Technology
Chitkara University, Himachal Pradesh
anshu.sharma@chitkarauniversity.edu.in
Pradeepta Kumar Sarangi
Chitkara University School of Engineering and Technology
Chitkara University, Himachal Pradesh
pradeeptasarangi@gmail.com
Ashwani Kumar
Chitkara University School of Engineering and Technology
Chitkara University, Himachal Pradesh
ashwani24122004@gmail.com

Abstract

The condition which happens when there is a little deterioration of the functionality of the organ named as “kidney” is known as kidney disease. Which can be also called CKD that is Chronic-Kidney-Disease and Chronic-Kidney-Failure (CKF). The Kidney’s work is to filter the waste from the body and over derived from the blood to produce Urine. We have different periods of CKD, In the early stages everything goes normally but in the later stages, dangerous stages of fluids, electrolytes combined with toxins can accumulate in the physique. The word “chronic” defines the progressive nature of organ (kidney) damage according to the time. The disease is rising very sharply in various regions all over the world. One human can live an absent of functioning kidneys for an approximately about 432 hours. This is the main reason for kidney transplants and dialysis treatments. For those suffering from severe renal failure, this short survival window emphasizes how vital and life-saving medical measures are. This study presents a methodology that uses a variety of clinical data to predict the status of CKD. This work implements three machine learning algorithms namely Gradient Boosting, Random Forest and KNN, in which Gradient Boosting got the best accuracy rate of 98.75%.

Keywords: Kidney Disease, machine learning, Decision Tree, SVM, KNN, XGBoost, Logistic Regression.

Evaluation of Machine Learning, Deep Learning, and Hybrid Techniques for Tomato Leaf Disease Detection and classification

Prof(Dr) Pavan Kumar Chaubey1, Prof(Dr) Tarun Kumar Arora2
Shivam Pandey3, and Amit Sharma4
1 Department of Applied Sciences, JBIT Dehradun, Uttarakhand, India 2 ABES Engineering College, Ghaziabad, India 3Department of Computer Science & Engineering, JBIT Dehradun ,Uttarakhand, India 4Department of Electrical Engineering, JBIT Dehradun, Uttarakhand, India
pavan197@gmail.com
tarun007@gmail.com
shivampandey566@gmail.com
amitsharma99@gmail.com

Abstract

Tomato leaf diseases significantly reduce yield and quality of the crops and therefore, the earlier diseases are detected, the more the agricultural sector is benefitted. In this paper, we study the application of advanced ML and DL tech-niques in the early detection of tomato leaf diseases. Two prominent approaches are explored: Multimodal deep hybrid learning of Bayesian optimized multi-model deep hybrid learning and Convolutional Neural Networks (CNNs). The CNN performs image segmentation and feature analysis for disease recognition; the hybrid approach uses a combined use of deep learning for feature extraction and machine learning for disease classification. The two methods are shown to classify different types of tomato leaf disease with high accuracy and efficiency from publicly available data sets like PlantVillage, using state-of-the art tech-niques such as bayesian optimization and transfer learning. Comparing against the results, we find that hybrid models help handle noisy and complex data slightly better, while CNN models are a faster real time. In this paper, we build on existing methods from image analysis to develop robust and scalable auto-mated systems for leaf disease detection that can be utilized by farmers and re-searchers as tools to enhance crop management.

Keywords: Deep Learning, Neural Network, CNN, Plant Leaf Dataset, Tomato

Indian Medicinal Leaf Detection: A Comparative Study with Custom CNN and VGG16

Mr Sadab Ali, Tejaswini Pradhan, Chinmayee Dora, Sunil Kumar Mohapatra,
Raj Kumar Mohanta, and Sujata Chakravarty
School of Engineering & Technology,
Centurion University of Technology & Management, India
alisadab404@gmail.com,pradhantejaswini15@gmail.com,
chinmayee@cutm.ac.in,sunil.mohapatra@cutm.ac.in,
rajkumar.mohanta@cutm.ac.in,sujata.chakravarty@cutm.ac.in

Abstract

Many medicinal plants are found across the Earth, providing a foundation for numerous drugs used to treat human illnesses for centuries. Precisely identifying medicinal plant species plays a crucial role in developing and preserving pharmaceuticals. This paper presents a comprehensive comparative analysis of two deep learning models a custom Convolutional Neural Network (CNN) developed from scratch and the pre-trained VGG16 model—applied to classifying medical leaf images. The primary objective of this study is to assess the performance of both models in terms of accuracy, precision, recall, and F1-score, providing insights into their electiveness for this specific classification task. Then these models could be deployed for a web application where the model could classify the captured and uploaded image by the user in real time. The CNN model was designed with a relatively simple architecture, consisting of multiple convolutional layers followed by max-pooling and fully connected layers. VGG16 is a deep, pre-trained model, known for its strong performance on large-scale image classification tasks. Both models were trained on a dataset of medical leaf images and fine-tuned to improve their performance. Results showed that the VGG16 model obtained a higher accuracy of 99% with its deeper architecture and pre-training on the ImageNet dataset. Whereas, the custom CNN model achieved 85% accuracy, a competitive result with reduced computational complexity. In the context of medicinal leaf detection, this study provides insightful information about the trade-offs between model complexity, accuracy, and computational effciency when using deep learning approaches.

Keywords: Medical leaf detection, deep learning, CNN, VGG16, image classification, comparative study

Bibliometric Analysis of Artificial Intelligence in Sustainable Agricultural Practices

Sanju Saha1, Anita Patra2 and Swati Suman3
1,3Department of Agricultural Extension Education,M.S. Swaminathan School of Agriculture,
2*School of Management
Centurion University of Technology and Management.
Paralakhemundi, 761211, Odisha, India
1sanju.saha@cutm.ac.in, 2anita@cutm.ac.in 3swati.suman@cutm.ac.in

Abstract

The growing world population and the urgent need for sustainable agricultural practices have brough attention to the transformative role of Artificial Intelligence (AI) in modern farming. This bibliometric study explores the research landscape of AI applications in agriculture from 2015 to 2024, analyzing data from 588 Scopus-indexed publications, of which 519 journal articles and conference papers were selected after refinement. The data were analysed using R Studio and VOS Viewer to reveal publication trend, keyword evolution, and geographic contributions, highlighting the rapid growth in AI-focused agricultural research, particularly after 2020. India emerged as top contributor followed by US and China, reflecting local preferences for using AI to solve problems in agriculture. Keyword analysis showed a shift from fundamental topics like sensitivity analysis and agricultural machinery to advance application like machine learning, precision agriculture and soil moisture optimization, highlighting the shift to data-driven farming solutions. The co-occurrence keyword network indicated how AI is being integrated with technologies like agricultural robotics, decision support systems and the Internet of Things (IoT), indicating a multidisciplinary approach to increasing sustainability and productivity. The study also found that, especially in poor nations, exorbitant costs, inadequate infrastructure, and a lack of technical know-how are obstacles to the widespread use of AI. To achieve lasting results, this study emphasises the necessity for affordable, approachable AI solutions and suggests that future investigations look at potential synergies between blockchain, AI, and climate modelling. By compiling critical developments and trends, this study provides a comprehensive overview of the role of AI in promoting sustainable agricultural practices and offers valuable insights to drive innovation and address socio-economic disparities.

Keywords: Artificial Intelligence, Sustainable agriculture and Crops

Exploring the Role of Artificial Intelligence on Marketing: Key Applications, Industry Transformations, and Emerging Trends Shaping the Future

Dr.Pramod Kumar Patjoshi1, Dr.Girija Nandini2, Dr.Umakanta Nayak3, Dr.Ratidev Samal4, Dr. Ansuman Jena5 and Dr. Rajani Agrawalla6
1pramodkumar@cutm.ac.in, 2girijanandini@cutm.ac.in 4ratidev.samal@cutm.ac.in
5ansuman.jena@cutm.ac.in, 6rajani.agrawalla@cutm.ac.in
1,2,4,5,6Centurion University of Technology and Management, Odisha, India.
3SVKM's Narsee Monjee Institute of Management Studies, Hyderabad, India,
umakant.nayak@gmail.com

Abstract

Artificial Intelligence (AI) has immense usage in marketing, revolutionizing how brands engage with consumers. It enhances data management capabilities, enables the development of complex algorithms, and broadens the scope of information and data sources. AI is reshaping brand-consumer interactions, with its applications varying based on the nature of websites and business models. By leveraging AI, marketers can focus on real-time customer needs, optimizing content targeting and choosing the right channels at the appropriate times, all guided by data insights generated by AI algorithms. Personalized experiences foster greater customer comfort and increase the likelihood of conversions. AI tools can also determine client expectations and evaluate the effectiveness of competitors' campaigns. Machine learning (ML), allows computers to evaluate and comprehend data independently, providing effective problem-solving skills. As more data is fed into ML algorithms, performance and accuracy continuously improve. Relevant articles on AI in marketing are found and examined in this study using resources including ScienceDirect, ProQuest, Google Scholar., Scopus, and Web of Science. Reviewing the role of AI in marketing, the article highlights the changes it has brought about and its specialized applications across different marketing industries. This article made a modest attempt to provide an overview of AI, highlighting its importance and impact in the field of marketing. It examines AI's applications across various marketing domains, identifies key use cases, and explores the transformative changes driven by AI in the sector. Additionally, the article includes a research-based discussion and provides a summary of key insights.

Keywords: Artificial intelligence; machine learning; organizational performance; business operations and enhancing profitability.

Organized by Department of Computer Science and Engineering

Analyzing the Contributions of Artificial Intelligence to Enhancing Business Intelligence Capabilities within E-Commerce Platforms

Dr. Ratidev Samal1, CMA CS Ajit Kumar Sabat2, Dr. Rajani Agrawalla3, Mr. Kshitish Kumar Mahapatra4, Dr. Pramod Kumar Patjoshi5,Dr. Sarthak Prasad Sahoo6
1ratidev.samal@cutm.ac.in, 2ajitkumar.sabat@cutm.ac.in
3rajani.agrawalla@cutm.ac.in, 5pramodkumar@cutm.ac.in, 6sarthakprasad.sahoo@cutm.ac.in
1,2,3,5,6Assistant Professor, 2Research Scholar
School of Engineering & Technology, Centurion University of Technology & Management

Abstract

This research investigates the role of Artificial Intelligence (AI) in augmenting Business Intelligence (BI) capabilities within e-commerce platforms. AI-driven BI systems have transformed traditional BI methodologies through automation of data processing, provision of real-time insights, and enhancement of decision-making processes. The study emphasizes the influence of AI technologies, including machine learning (ML), natural language processing (NLP), and predictive analytics, on critical e-commerce functions such as demand forecasting, customer segmentation, inventory management, and dynamic pricing. Through secondary data analysis and case studies from prominent e-commerce platforms like Amazon and Alibaba, the research illustrates the substantial business value created by AI-powered BI systems. Notable improvements include enhanced accuracy in sales predictions, minimized stockouts, and improved operational efficiency. Additionally, AI's capacity to personalize customer experiences through predictive analytics has led to increased customer retention and conversion rates. A comparative analysis highlights that AI-integrated platforms consistently outperform traditional systems regarding sales growth, customer satisfaction, and cost reduction. Limitations of the study, including restricted access to proprietary data and the generalizability of findings, are acknowledged. Future research directions include exploring AI ethics, data privacy concerns, and the integration of AI with emerging technologies such as blockchain and IoT.

Keywords: Artificial Intelligence, Business Intelligence, E-commerce, Predictive Analytics, Machine Learning.

Application of Machine Learning in Post-Process Dimensional Accuracy Prediction During Precision Machining

Sarthak Prasad Sahoo,1*, Ajit Kumar Sabat,2, Rajani Agrawalla2, and Ratidev Samal2
1*Dept. of Mechanical Engineering, CUTM, Bhubaneswar, Odisha (India).
sarthakprasad.sahoo@cutm.ac.in
2School of Management, CUTM, Bhubaneswar, Odisha (India).

Abstract

The advent of advanced machine learning (ML) techniques has revolutionized predictive modeling in precision machining, offering significant improvements in post-process dimensional accuracy. Using secondary data from various research repositories and simulation results, the present study tries to explore the use of models of ML to forecast the dimensional deviations during precision machining. Precision machining plays an integral role in industries such as aerospace, automotive, and medical manufacturing, where the accuracy of parts directly impacts operational efficiency, safety, and product quality. However, challenges persist in achieving consistent post-process dimensional accuracy, necessitating the exploration of innovative solutions. This study evaluates the efficacy of ML models, including decision trees, random forests, gradient boosting machines, and neural networks, for dimensional accuracy prediction. The research compares these models' performance through a detailed statistical analysis, utilizing metrics such as RMSE, R^2, and MAE to assess their accuracy. When compared to conventional techniques, the results show that ML models—in particular, neural networks, significantly improve prediction accuracy. Additionally, the research highlights deficiencies in existing literature, including the restricted use of multi-factorial models and the dependence on primary data. The results highlight how ML can completely transform precision machining quality control, with significant implications for both researchers and practitioners.

Keywords: Precision machining, machine learning, dimensional accuracy, predictive modelling, quality control.

Intelligent Data Forwarding in Cloud Using Bio-ACO Integrated with ANN and SCTP(BIAS) Framework

P.Venkadesh1,S.V.Divya 2,V.Mathumitha3, Geetha Ponnaian4 ,P.Rajkumar5, G.Mohana Prakash6

1,2,5,6 V.S.B College of Engineering Technical Campus, Coimbatore-642109, Tamilnadu,India.

3Bharath Institute of Higher Education and Research, Chennai-600073,Tamilnadu,India.

4Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, India.

pvenkadesh2002@gmail.com

Abstract

A reliable and seamless data transmission in cloud environment is essential to address the challenges posted by the dynamic network conditions. Due to the multi-homing and multi-streaming capability of Steam Control Transmission Protocol (SCTP), the data transmission capability is highly guaranteed. However, the default path selection mechanisms of SCTP and also due to the fluctuating network loads, this may not be always optimal in case of dynamic cloud networks. This paper proposes an enhanced framework by integrating SCTP with Bio inspired -Ant Colony Optimization (Bio-ACO) algorithm and Artificial Neural Networks for secure data forwarding. The adaptive, pheromone-based path selection mechanisms of Bio-ACO were highly helpful in monitoring and optimizing the data forwarding path effectively in real time. Through simulation, we observed that the proposed Bio-inspired ACO with ANN and SCTP (BIAS) algorithm proves to be better than state of the art methods in terms of accuracy rate of 98.5%, packet delivery ratio of 99.2% and a throughput of 9.2 Mbps.

Keywords: SCTP, Multi-streaming , Multi-homing, Data forwarding, Ant-colony based optimization, Artificial Neural Networks.

Detection of Defects in Solar (PV) Panels Using Dimension Reduction Model

Smita D Khandagale1 *, Sanjay M. Patil2
1 Electronics Engineering, Datta Meghe College of Engineering, Airoli, Navi-Mumbai University of Mumbai, MS, India
e-mail: sdkhandagale@vpmthane.org
2 Electronics Engineering, Datta Meghe College of Engineering, Airoli, Navi-Mumbai University of Mumbai, MS, India
e-mail: sanjay.patil@dmce.ac.in

Abstract

We present a thermal imaging-based solar panel defect detection system that reduces the requirement for human panel inspection in large solar farms by automating the inspection process. Twelve classes - cell, vegetation, cracking, soiling, diode, shadowing, diode-multi, hot spot-multi, hot spot, offline module, no-anomaly, and cell-multi. The dataset employed included 20,000 photographs taken from infrared solar modules, including a wide range of representations. We used the Efficient-BM (E-BM) model in the process. We selected 17,000 characteristics from the example model using the feature selector. We carried out the classification process using an SVM classifier. The suggested approach produced excellent outcomes with parameters such as F1-score, accuracy, sensitivity, and precision measures when work on 12 label dataset. The average values of these outcomes are 93.99% accuracy, 91.50% precision, 88.28% sensitivity, and 89.82% F1-score.

Keywords: Fault detection; photovoltaic panels; deep learning; infrared imaging

ML-Based Alzheimer's Disease Detecting using Behaviour Indications: A Review

B S Panda1, Sasmita Kumari Nayak2 and Anil Chakravarthy3
1 Raghu Engineering College, Visakhapatnam, India.
2&3 Centurion University of Technology & Management, Odisha, India.
bspanda.cse@gmail.com

Abstract

Worldwide, there is an unmet clinical need for accurate sickness diagnosis. The intricacy of the many diverse Alzheimer's illnesses and the underlying symptoms of the patient population make it extremely challenging to develop a technique for early detection and a welll treatment plan. Researchers, physicians, and patients can use machine learning (ML), a part of artificial intelligence (AI), to overcome many of these problems. This review outlines how machine learning techniques are being applied to find in the early detection of several diseases, based on pertinent research. The most recent advancements in ML-based disease detection and telemedicine are then summarized in the paper, taking into consideration the algorithm, different disease types, different behaviors, different applications, and different assessment metrics. We conclude by summarizing the key findings and offering some insight into potential future developments and lines of inquiry. The progressive neurodegenerative disease known as Alzheimer's disease (AD) is a major universal health concern, especially for aging populations. Improving management and treatment results requires early identification. The ability to detect AD through behavioral indicators such speech patterns, facial expressions, motor activities, and daily routines has been greatly enhanced by recent developments in machine learning (ML). Modern machine learning techniques applied to behavioral data for AD detection are examined in this review. We examine important datasets, models, and feature extraction techniques, such as supervised, unsupervised, and deep learning methods. There is also discussion of difficulties including data sparsity, ethical issues, and multimodal data integration. The paper also identifies future directions for developing accurate, non-invasive, and easily available diagnostic instruments that have the potential to completely transform early detection and intervention techniques.

Keywords: Telemedicine, artificial intelligence, Alzheimer's diseases, Behaviours, healthcare.

A Comparative Study of Advancements in Machine Learning-Based Speaker Recognition Models

Ramesh Babu Jonnalagadda, Associate Professor, CSE
drrameshbabu.jonnalagadda@gmail.com
Rajanikanth Mohanty, Associate Professor, CSE-SE
m.rajanikanta@jainuniversity.ac.in
Rohan UK, CSE
rohanuk02@gmail.com
S. Saravana, Assistant Professor, CSE
s.saravanakumar@jainuniversity.ac.in
JAIN University, bangalore
S. Vanitha, Assistant Professor, CSE
PES Univesrity, Benglore
vanithaarvind@gmail.com

Abstract

Forensic Speaker Recognition plays a pivotal role in criminal investigations by identifying individuals through speech characteristics. This review explores recent advancements in automated speaker recognition (ASR) models leveraging machine learning techniques. Key methods analyzed include feature extraction, model training, and performance optimization strategies. Techniques such as MelFrequency Cepstral Coefficients (MFCC), Linear Chirplet Transform (LCT), and Two-Tier Feature Extraction with Meta heuristics-Based Automated Forensic Speaker Verification (TTFEM-AFSV) demonstrate advancements in accuracy and robustness under varied conditions. The integration of deep learning frameworks, optimization algorithms, and adaptive filtering techniques significantly enhances recognition capabilities. However, challenges such as low-quality speech data, black-box model interpretability, and limitations in complex tasks like emotion or mixed-dialect recognition persist. This paper concludes by emphasizing the potential of hybrid approaches combining diverse methodologies to achieve superior performance in forensic and real-time applications.

Keywords: Forensic Speaker Recognition, ASR Models, Feature Extraction, Deep learning frameworks, Metaheuristics, Hybrid Approaches

Leveraging Term Frequency Inverse Document Frequency for Job Title Prediction: A Comparative Study of Machine Learning Algorithms

Katla Vitesh Babu1, Gosu Ajay Balaji1, M. Vijay2, A. Mahalakshmi1, D. Deepthi1, Sneha.H. Dhoria3*

1Department of Computer Science and Business Systems, R.V.R. & J.C. College of Engineering, Guntur, India

2Department of Mechanical Engineering, Centurion University of Technology and Management, Odisha, India.

3Department of Mechanical Engineering, R.V.R. & J.C. College of Engineering, Guntur, India

Abstract

Job title prediction from description data is a crucial task in automating job classification and improving digital job search platforms. This paper evaluates the performance of advanced machine learning models—K-Nearest Neighbors, Support Vector Machines, Gradient Boosting, and Logistic Regression—for predicting job titles based on descriptive text. Experiments were conducted using two data splits 80:20 and 70:30 for training and testing. Results reveal that the 80:20 split consistently outperforms the 70:30 configuration in terms of prediction accuracy. Among the evaluated models, Gradient Boosting achieved the highest performance, with an accuracy of 98.83%, utilizing the Term Frequency Inverse Document Frequency (TF-IDF) technique. Furthermore, Gradient Boosting recorded the highest F1-score of 0.94, along with a recall of 0.89 for the class for target class. These findings highlight the superior capability of Gradient Boosting in capturing complex patterns in textual data and emphasize the importance of data preprocessing and splitting strategies. The outcomes contribute to the optimization of machine learning applications in employment platforms, enhancing user experience and efficiency in matching candidates with appropriate job opportunities. In this paper, the focus is on the gap in bringing job seekers and proper opportunities to improve a more transparent, efficient, and trustworthy job marketplace.

Keywords. Job title prediction, Machine learning, Job descriptions, Gradient Boosting, Term Frequency Inverse Document Frequency, F1-score.

Towards Motion Planning of Multi Wheeled Mobile Robots Using Dijkstra Algorithm in Complex Uncertain Environments

Prasant Ranjan Dhal1,a*,Bibhuti Bhusan Choudhury2
1,2Department of Mechanical Engineering, Indira Gandhi Institute of Technology, Sarang, Odisha-759146, India
aResearch Scholar (Engineering) Biju Patnaik University of Technology, Rourkela
prdhal@gmail.com1*, bbcigit@gmail.com2
*Corresponding Author

Abstract

This research work reflects an idea about optimized route planning technique for single wheeled mobile robot in an obstacle rich environment. Here Dijkstra's algorithm has been used to control the robot smoothly. Simulation has been done using VREP software for wheeled mobile robot navigation. After simulation, real time arena experiment has been performed to justify the result of simulation. After performing simulation and experimental analysis, it has been clearly observed that, during single robot navigation, the deviation between average distance covered by robot in simulation and experimental analysis is 5.37 % and the deviation between average time taken by robot to reach its destination in simulation and experimental analysis is 5.26%.

Key Word- Wheeled Mobile Robot, Dijkstra's Algorithm, Path Planning

Enhancing NER in the Medical Domain: A Transformer-Based Approach with Adversarial Training

Dhawaleswar Rao CH1, Satyanarayan Sahu2*, Saurya Ranjan Das3

1,2*,3 Computer Science and Engineering,
Centurion University of Technology and Management, R.Sitapur, Odisha, India
E-mail(s): dhawaleswar.rao@cutm.ac.in, satya.sahu@cutm.ac.in, sauryaranjan.das@cutm.ac.in

Abstract

This research presents a novel transformer-based approach for Named Entity Recognition (NER) in the medical domain, utilizing BioBERT and ClinicalBERT to enhance the accuracy and robustness of entity extraction from educational texts. The methodology encompasses several key stages, beginning with data collection from a diverse array of medical educational resources, including textbooks, clinical notes, and research articles. The dataset is meticulously annotated to encompass various entity types, such as diseases, symptoms, medications, and anatomical terms. Our approach leverages the powerful contextualized representations generated by BioBERT and ClinicalBERT, which are pretrained on extensive biomedical corpora, allowing for the capture of intricate relationships and dependencies within the text. The model undergoes fine-tuning using a supervised learning framework that incorporates adversarial training, further enhancing its resilience against noisy data. Postprocessing techniques are employed to refine entity recognition, ensuring accurate boundary delineation and normalization of multi-word entities. The proposed system is rigorously evaluated against established benchmarks, yielding impressive results, with an overall F1-score of 89.4% and entity-level accuracy of 86.6%. Comparative analyses against ten existing NER systems illustrate the superiority of our approach, particularly in recognizing complex medical terms and handling diverse entity categories. These findings underscore the potential of transformer-based models in advancing medical informatics, thereby contributing to more effective knowledge extraction and improved educational outcomes in the medical field.

Keywords: Adversarial Training, BioBERT, ClinicalBERT, Contextualized Representations, Named Entity Recognition, Supervised Learning.

Optimizing Urban Traffic: A Combined Model of Image and Traffic Features

Kaustubh Kale[0009−0005−2708−2725], Naquiya Juzar[0009−0009−5691−0082], Pravin Kumavat[0009−0001−0114−0692], Swapnali Kulkarni[0009−0004−0577−8337], and Priyanka More[0000−0003−1317−4571]

Vishwakarma Institute of Information Technology, Pune, India

Abstract

Managing traffic flow at intersections is a critical aspect of urban transportation systems. Traffic signal timing can be optimized and thus, congestion can be reduced, travelling and road safety can be improved. This paper aims to introduce a new optimization method for traffic signal timing based on integrating data of intersections through image-based information with different features in traffic, including the number of ways, traffic direction, density of vehicles, and historical signal timing. Leveraging the ResNet50 model for feature extraction and a fully connected neural network for signal timing prediction, our approach enables efficient and effective traffic management by providing optimal signal timings tailored to real-time traffic conditions. The model is trained with Mean Squared Error as the loss function and AdamW as the optimizer, and it contains an extra simulation layer that captures the effect of vehicle density as well as historical timing patterns. Experimental results demonstrate the effectiveness of our method in minimizing traffic congestion and improving vehicle flow through intersections.

Keywords: Traffic signal optimization· ResNet50· convolutional neural networks· vehicle density· intersection management· signal timing prediction· traffic flow· urban traffic management· deep learning· traffic feature extraction· neural networks· mean squared error (MSE)· AdamW optimizer· image-based traffic analysis.

Developing a Data-Driven Personalized Fitness Web Application for Obese and Sedentary Individuals with Django

Rukayat Balogun1, Celestine Iwendi2

1,2 School of Creative Technologies, University of Bolton, United Kingdom
1rukayat.balogun111@gmail.com, 2c.iwendi@bolton.ac.uk

Abstract

This paper presents the development of a data-driven personalized fitness web application aimed at combating obesity and sedentary behavior. The web application leverages machine learning algorithms, particularly Gradient Boosting, to provide individualized fitness and dietary recommendations based on user input, such as BMI, activity levels, and health data. Built on the Django framework, the application ensures scalability, security, and ease of use. Key features include real-time adaptive recommendations, a user-friendly interface, and a feedback loop that personalizes fitness plans according to user progress. The machine learning models were trained on a large dataset and tested against several models, with Gradient Boosting achieving the highest prediction accuracy (R2= 0.9975). Initial user feedback indicated high satisfaction, particularly due to the system's adaptability to evolving health conditions. Future research directions include enhancing algorithm performance, expanding data sources, and incorporating wearable devices for more precise real-time recommendations.

Keywords: Personalized fitness, machine learning, Gradient Boosting, Django, sedentary behavior, obesity, real-time recommendations, BMI prediction.

TRACK 2
DATA SCIENCE APPlICATIONS

Enhanced Document Clustering Using Residue Modulo Partitioner in Map-Reduce Framework

Hemanth Kumar Vasireddia, Purnachandra Raob, Om Prakashc, Manikanta Vellad

Assistant Professor, Computer Science Engineering, GITAM University, Visakhapatnam, Andhra Pradesh 530045, India, Corresponding Author, Email: hvasired@gitam.edu

bAssistant Professor, Computer Science Engineering, BVRIT, Narsapur, Telangana 502313, India, Email: purnachandrarao.m@bvrit.ac.in

cAssociate Professor, Associate Professor, CSE(Data Science), Anil Neerukonda Institute of Technology and Sciences, Visakhapatnam, 531162, Andhra Pradesh, India, Email: om.prakash02420@gmail.com

dAssistant Professor, Data Engineering, MVGR College of Engineering, Vizianagram, 535005, Andhra Pradesh, India, Email: manikantavella48@mvgrce.edu.in

Abstract

Information Retrieval (IR) is a domain within computer science focused on the efficient retrieval of text documents based on user queries containing specific keywords. The demand for automated IR systems has grown significantly to meet business requirements based on user inquiries. Recent techniques have proposed various IR frameworks utilizing different data mining algorithms, as well as novel map and reduce approaches, while leveraging default partitioners. However, none of these methods have effectively utilized custom partitioners. The primary goal of this paper is to implement a custom partitioner, Residue Modulo-K, where K denotes the number of reducers used in the process. Map Reduce framework utilizing proposed custom partitioner to the default partitioner is executed and the results were tabulated. Based on the experimental analysis the proposed custom partitioner outperformed the default one. The performance metrics utilized for this study are job execution time, data transfer time, CPU utilization, and F-score.

Keywords: Map-reduce, Hadoop, Clustering, Partitioner, Text data, Distributed parallel processing.

A Detailed Study: Application of Big Data Analytics in Health Care Sector and Treatment of Cancer Disease

Jayavardhanarao Sahukaru1, Dr. Sangram Keshari Swain2*,Dr. Bendi Venkata Ramana3

1Ph. D Scholar, Dept. of CSE,

jayavardhanarao.mca@gmail.com

2 Professor, Dept. of CSE,

sangrambapun@gmail.com

1,2 Centurion University and Management (CUTM), Odisha, India.

3 Professor, Dept. of IT,

Aditya Institute of Technology and Management, Tekkali, India.

dr.bvramana@adityatekkali.edu.in

Abstract

Big data is a declaration used to recognize the database whose area is the potential of typical database software tools to store, organize and examine. Big data have demonstrated a new path towards the world. Cancer is a group of diseases characterized by uncontrolled cell growth and the potential to invade or spread to other parts of the body, often resulting in the formation of tumors. It has been a deadline for millions of people. Every cancer is particular and the medical treatment is complex. The data of each cancer patient are too large and it varies from one person to another person. This paper will traverse censorious tools and tackle that accelerate knowledge, locating along with the cancer study continuity.

Keywords: Disease Prediction, Cancer Disease, Big Data Analytics.

A Novel 3D Image Rendering Technique to improve accuracy of depth recovery, visualization and image compression of random images dataset

Prabhjyot kaur Haryal1 and Punam Rattan2

1 Department of Computer Science and Engineering, Shri Ram Institute of Technology, India

2 School of Computer Application, Lovely Professional University, India

Abstract

Three-dimensional reconstruction is a perennially unsolvable problem that has prompted decades of research in the fields of computer vision, computer graphics and machine learning. Since 2015, convolutional neural networks have become more and more well-liked and have demonstrated exceptional performance in image-based 3D reconstruction Both computer vision and computer graphics depend on image-based rendering, which is also extensively utilized in virtual reality technologies. In contrast to conventional 3D computer graphics, which use the scene's 3D geometry, image-based rendering approaches create new views straight from input photographs. Image-based rendering and conventional 3D graphics can be combined in a joint image and geometry space, according to the continuity between images and geometry utilized in image-based rendering approaches.

Keywords: Image Identification, Orientation, Visualization, 3D Recognition, Polygon Clipping, 3D Image-based Rendering, Depth Estimation, Accuracy, Geometric Transformation, Image Compression, 3D Reconstruction

A Secure Protocol for Cloud Data Deletion and Evidence Verification Leveraging Invertible Bloom Filters

Dr S. Vijayanandl , S Jerald Nirmal Kumar 2, G Nagendra Babu 3,
Dr,A. Sathish 4 Muthaiah U 5
I,2,3 School of CSE, Jain Deemed to be University , Bangalore , India. 562112
4 Department of CSE, Roever Engineering College, Perambalur .
5 Departrnent of CSE, Amrita Vishwa Vidyapeetham Chennai, Tamil Nadu, India.
1 profvijayanand84@gmail.com, 2 jeraldcse@gmail.comcom, 3 nagendra2nag@gmail.com
4 sathishroever05@gmail.com, 5 u_muthaiah@ch.amrita.edu

Abstract

The task to manage cloud data and eliminate it securely creates challenges because it involves preserving privacy alongside legal compliance. This paper presents a secure data wiping method using IRF technology to achieve eminent verification Of cloud-based data elimination operations. The protocol helps the users to select certain block to delete which are not useful but keep those that will be useful for other uses, giving the cloud users better control over their data. Another facet of the scheme introduced in the paper is its twofold verification possibility, public and private. Legal use cases can sign off on the deletion process using proofs of the deletion process and products of the deletion process, thus provide confirmation that data deletion defines data disposal without revealing sensitive information in the process. This approach eliminates the likelihood of antagonist data retention by implementing mechanisms for sensing and outing fakes of cloud providers. That is why the presented IBF-based design effectively deletes data by quickly locating and erasing specific entities while minimizing computational load. The users can instruct deletion and generate verifiable deletion receipts to avoid manipulations and abuses. It also identifies fake deletion claims thus helps in preventing mistrust between the cloud service providers and users. The record of deletion operation can be certified by public auditors or other authorized verifiers without referring the actual data.

Keywords: Invertible Bloom Filter (IBF), Cloud Data Deletion, Public Verifiability, Private Verifiability, Secure Data Management, Malicious Data Retention, Cloud Security, Data Integrity Verification.

SECURE STREAM PRO–ADVANCED IMAGE AUDIO VIDEO ENCRYPTION AND SHARING SOLUTION FOR CONFIDENTIAL CONTENT MANAGEMENT

Hema Ambiha.A 1 and Balasubramaniyan Mm2

1,2 Karpagam Academy of Higher Education, Coimbatore, Tamil Nadu, India

hemaambiha.aravindakshan@kahedu.edu.in

Abstract

The growing reliance on digital media, safeguarding multimedia data such as photos, music, and video is critical for protecting sensitive information from unauthorised access. Because of the differences in data architectures, file sizes, and real-time pr(kzessing requirements, different forms of multimedia data provide distinct encryption issues. Some of these difficulties are addressed by existing encryption methods, such frequency masking and pixel shuffling for audio and picture encryption, as well as bit stream-level algorithms for video encryption. However, obstacles still exist in implementing real-time encryption while retaining data quality during the encryption and decryption procedures. This work presents a hybrid cryptographic strategy that combines Elliptic Curve Cryptography (ECC) with the Advanced Encryption Standard (AES) to improve multimedia data security. Using the characteristics of both methods, the suggested technique attempts to increase encryption efficiency and resilience while satisfying the performance needs of multimedia applications. This research also investigates the issues of assuring security while maintaining the quality of encrypted material and presents methods to overcome these constraints, adding to the field of digital rights management, secure communication, and personal data protection.

Keywords: Network security, Cryptography, Multimedia, Asymmetric encryption, Sensitive data.

Evaluating the Performance of Indian Private Sector Banks Using Balanced Scorecard and Statistical Modeling

Sushmitha Rao1, Rajesh Raut2, Bonnie Rajesh 3, Amruta Deshpande4
Natasha Kaul5, Aman Jandwani6, and Amit Kumar Arora7
1,4 Indira School of Business Studies PGDM, Pune, India
2,3 MIT School of Distance Education, Pune, India
5 Symbiosis Center for Management and Human Resource Development Pune,
Symbiosis International University, Pune, India
6 CEO, Research task, Chandigarh
7 Ex-Research Scholar, IIT Madras
sushmithamithur@gmail.com
dr.rwraut@gmail.com
rajeshbonnie2826@gmail.com
amruta.deshpande@indiraisbs.ac.in
natashaa_kaul@scmhrd.edu
amanparas2000@gmail.com
Amit.riselab@gmail.com

Abstract

The growing reliance on digital media, safeguarding multimedia data such as photos, music, and video is critical for protecting sensitive information from unauthorised access. Because of the differences in data architectures, file sizes, and real-time pr(kzessing requirements, different forms of multimedia data provide distinct encryption issues. Some of these difficulties are addressed by existing encryption methods, such frequency masking and pixel shuffling for audio and picture encryption, as well as bit stream-level algorithms for video encryption. However, obstacles still exist in implementing real-time encryption while retaining data quality during the encryption and decryption procedures. This work presents a hybrid cryptographic strategy that combines Elliptic Curve Cryptography (ECC) with the Advanced Encryption Standard (AES) to improve multimedia data security. Using the characteristics of both methods, the suggested technique attempts to increase encryption efficiency and resilience while satisfying the performance needs of multimedia applications. This research also investigates the issues of assuring security while maintaining the quality of encrypted material and presents methods to overcome these constraints, adding to the field of digital rights management, secure communication, and personal data protection.

Keywords: Network security, Cryptography, Multimedia, Asymmetric encryption, Sensitive data.

A Balanced Scorecard-Based Comparative Analysis of Performance Metrics in Indian Public and Private Sector Banks with Regression Insights on Return on Assets

Bonnie Rajesh 1, Rajesh Raut2, Sushmitha Rao 3, Komal Singh4, Aman Jandwani 5,
Amit Kumar Arora 6 and Virendra Vasant Tatake 7
1,2 MIT School of Distance Education, Pune, India
3,4 Indira School of Business Studies PGDM, Pune, India
5 CEO, Research task, Chandigarh
6 Ex-Research Scholar, IIT Madras
7 Director, Institute Indira Global School of Business
rajeshbonnie2826@gmail.com
Rajesh.raut@mitsde.com
sushmithamithur@gmail.com
komal29m@gmail.com
amanparas2000@gmail.com
Amit.riselab@gmail.com
director@indiragbs.edu.in

Abstract

The performance of selected Indian private sector and public sector banks is compared in this study. The top three private sector banks (PVSBs) and public sector banks (PSBs)based on total assets were chosen for the study. The authors designed a comprehensive performance measurement framework based on the balanced scorecard approach of Kaplan and Norton. According to the study, the performance of PSBs and PVSBs differs significantly. From the regression analysis, it can be concluded that the selected variables significantly impact return on assets (ROA). This study offers observations for policymakers that might result in more successful strategies for improving the efficiency and performance of the banking sector. The significant antecedents related to banks' ROI have been identified via research This research contributes significantly to investigating the antecedents of ROA and provides insights regarding factors influencing the ROA.

Keywords: Balanced Scorecard, Private sector banks, Public Sector Banks, Performance measurement, Return on Assets.

Fraud Guard: Enhancing Credit card Security using Graph Neural Network Models

Uma Maheswari V1 , Sai Shruthi Bodire1 , Sanjana Bontha1
1Chaitanya Bharathi Institute of Technology, Hyderabad, India
Umamaheswari@ieee.org

Abstract

Credit card fraud is considered as a significant security issue in the financial sector in which early identification of fraud ensures minimisation of losses. Consequently, traditional methods of developing supervised models and feeder systems bear several challenges in adequately representing the underlying multi-layered structure in predominantly transactional data. This paper seeks to meet these challenges through a discussion on the use of Graph Neural Networks (GNNs) in credit card fraud detection. Transaction data is well suited for modelling using GNNs where nodes of a graph represent transactions and an edge defines possible connections such as shared accounts or merchants. The proposed approach here is to employ GNNs to model the timing and nature of transactions in the associated transaction graphs to detect such transactions. GNN models are able to explore both local and global aspects of the transaction network by integrating transactional features into a graph-based framework. The performance of the experimental results shows that the accuracy, precision, and recall of the GNN models are much higher than those of the traditional detection methods. Moreover, it is discovered that GNNs can effectively capture alterations of transactional contexts and therefore be employed in real-time fraud detection.

Keywords: Credit card fraud, Credit card fraud detection, GNN, transaction data, fraud detection, real time fraud, anomaly, financial fraud detection

Design and Implementation of Quantum based Hamming Encoder and Decoder for Error Detection Applications

Nutan Das1 and Chandra Sekhar Dash1
1 Department of Electronics and communication Engineering, Centurion University of Technology and Management, Odisha, 752050, INDIA
nutan.das@cutm.ac.in
chandrasekhar.dash@cutm.ac.in

Abstract

Rapidly increasing quantum computing in every diversity for speed-up data communication and secure cryptography, the need for efficient data error correction and fault tolerance techniques is adopted. Quantum Hamming code is one of the crucial approaches for correcting single-bit errors in quantum data. In this paper, Quantum Hamming Encoder (QHE) and Quantum Hamming Syndrome Decoder have been designed and implemented on the Qiskit IBM platform. Qiskit (Quantum Information Software Kit) is the highest performing Quantum Software Development Kit (SDK) to design, synthesize, transpiling, and optimize the quantum circuits. The T count for the decoder was found to be 21, and the T-depth was found to be 69, respectively. Thus, fewer T gates translate to fewer ancillary qubits and lower time and energy costs in executing the circuit. T-count directly lowers the complexity and cost of error correction. For error bit detection, the intended error can be used in memory cells and data security applications.

Keywords: Quantum Computing, Quantum gates, Qiskit IBM, Quantum Hamming coder, Syndrome Decoder

Healthcare Confidential: Multi-Agent Systems Revolutionizing Data Privacy

Indira Priyadarshini G1, and Venkatesh Yadav N 2
1 Scholar School of CS & AI, SR University,
Ananthasagar, Hasanparthy, Warangal-506371, Telangana,India. 2
Professor Department of CSE,School of CS & AI,SR University,
Ananthasagar, Hasanparthy, Warangal-506371,Telangana,India.
2303c50233@sru.edu.in
venkatesh.naramula@sru.edu.in

Abstract

Coordinating advanced medical service advancements has further developed patient consideration through Electronic Health Records (EHR). Even digitizing touchy E-Health information presents complex difficulties in maintaining patient security. The "E-Health Information Protection Saving utilizing Multi-Specialist Framework" project proposes an imaginative way to defend individual E-Health data successfully utilizing a multi-specialist framework structure. This structure uses disseminated specialists, each liable for taking care of explicit errands,for example, information encryption, access control, and continuous checking of security arrangements. By utilizing the standards of decentralized direction and role-based access control, the framework guarantees that E-Health information is available just to approved elements while keeping up with full auditability and consistency with existing security regulations. The multi-agent system architecture enhances the security and privacy of e-health data and improves system scalability and adaptability in dynamic healthcare environments. The typical result of this undertaking is a vigorous well-being information security conservation framework that safeguards patient data against unapproved access and potential information breaks, subsequently expanding trust among clients and advancing more extensive reception of computerized well-being administrations.

Keywords: E-Health Data Privacy, Multi-Agent Systems, Privacy Preservation, Health Information Security, Distributed Systems, Data Protection.

Blockchain for Cloud Security: Enhancing Integrity, Validation, and Fault Tolerance

1V.Uday Kumar, 2Kaila Shahu Chatrapati
1Research Scholar, JNTU Hyderabad, India.
Email:uday009u@gmail.com
2Professor , Department of CSE, JNTU, Hyderabad, India
Email:shahujntu@gmail.com

Abstract

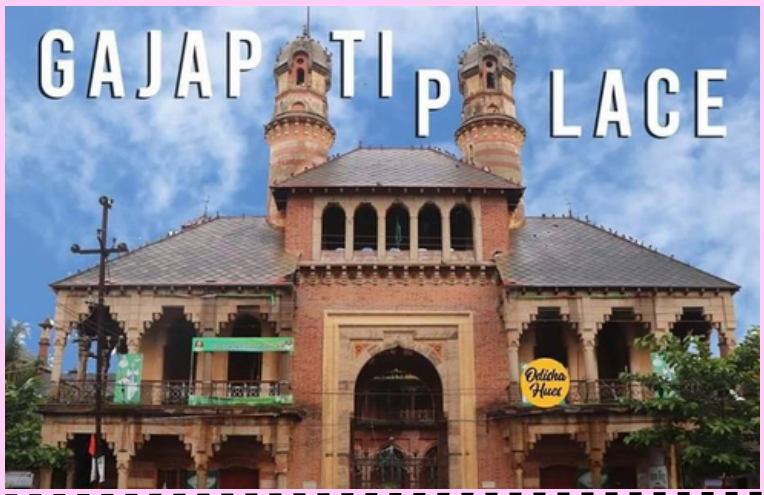
Cloud computing has transformed various industries, but data security remains a major challenge. Blockchain technology, with its decentralized, transparent, and unchangeable nature, offers a promising solution to enhance cloud security. This paper explores recent blockchain-based approaches for protecting cloud systems, focusing on secure data storage, transaction verification, and fault tolerance. Our experiments show that integrating blockchain can significantly improve cloud security, making it more reliable, scalable, and efficient. We also highlight areas that require further exploration and improvements in this field.

Keywords: Fault Tolerance, Cloud Security, Decentralized Systems, Blockchain Technology

About Paralakhemundi

Paralakhemundi, shortly known as Parala, is the district headquarters of Gajapati district and one of the oldest municipalities established in 1885, in the Indian state of Odisha. The majority of the people in the town speak Odia. The city and the district share its boundaries with Andhra Pradesh. The adjacent town of Pathpatnam is separated by the River Mahendra Tanaya. In the later medieval period, it became the capital of the Paralakhemundi Estate of the Eastern Ganga dynasty kings of the Khemundi branch. The town is well known for being an ancient cultural center of Odisha and the birthplace of noted personalities including poet Gopalakrusna Pattanayaka, statesman Krushna Chandra Gajapati Narayan Deo, lexicographer Gopinatha Nanda Sharma, and historian Satyanarayana Rajguru. This town is also known for its century-old temples, monasteries, palaces, and heritage buildings.

Places to visit near Paralakhemundi

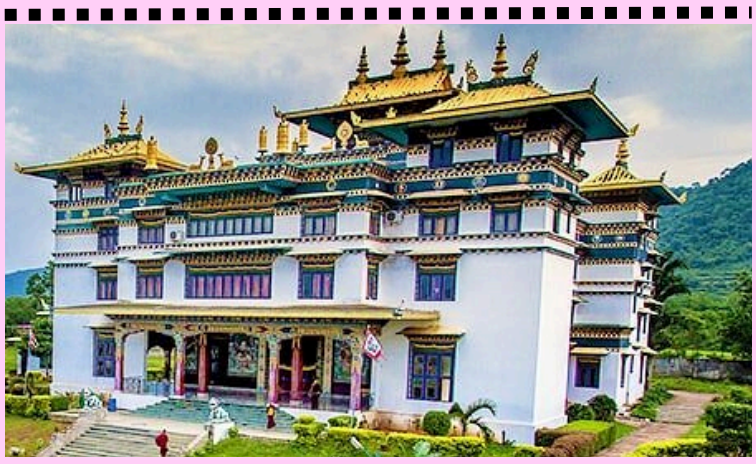


Gajapati Palace

Maharaja Krushnachandra Gajapati, the erstwhile ruler of Paralakhemundi State near the Andhra – Odisha border, was one of the greatest luminaries of Odisha throughout its history. A visionary and passionate soul for art and heritage, Maharaja Krushnachandra Gajapati was one of the first Odias to initiate the movement for separate statehood for the Odia-speaking people. The seeds for such a noble initiative were germinated in the Gajapati Palace of Paralakhemundi.

Padmasambhava Mahavihara Monastery

The Padmasambhava Mahavihara monastery at Chandragiri, near Mohana of Gajapati District of Odisha is the largest Buddhist Monastery in South Asia. It is named after Acharya Padmasambhava, an Odisha born monk who spread Buddhism in Tibet in 7th century. There are around 200 monks residing here. It is a beautiful religious and peaceful place to visit in Ganjam-Gajapati district, Odisha.

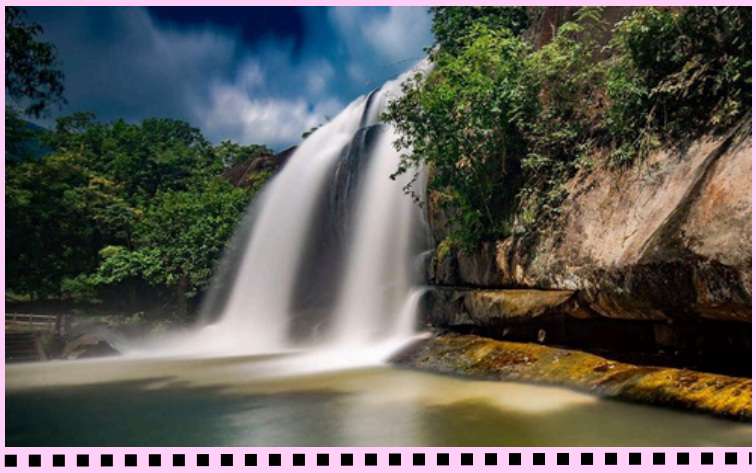


Mahendragiri

Mahendragiri, located in Gajapati district, is a renowned tourist and religious site in eastern Odisha. This peak, part of the Eastern Ghats, rises to 1,501 meters (4,976 ft) above sea level. According to Hindu mythology, Lord Parshuram meditated on Mahendragiri and received the divine Parsu (double axe) from Lord Shiva. The site offers breathtaking views and is surrounded by lush greenery and historical temples.

Gandahati Waterfall

The Gandahati waterfall is a well-liked natural landmark. It is a popular tourist destination in Odisha's Gajapati District that sees a lot of traffic in the winter. This waterfall is well-known for its sparkling cascade, which flows consistently and year-round. Visitors from all surrounding places have been drawn to it by its beautiful charm amidst the forest cover.



Taptapani

Taptapani is famous for its hot sulfur water spring. The name "Taptapani" also suggests that. "Tapta" means hot and "pani" means water. The hot water from the natural spring of Taptapani are attributed with medicinal properties and can be bathed in at the pond created next to the hot spring.The hot spring is situated at the eastern slope of the eastern ghat at a crest of the hill with in the lush green forest having wide range of flora and fauna.