Mapana – Journal of Sciences
2024, Vol. 23, Special Issue 3, *v-viii*
ISSN 0975-3303 | https://doi.org/10.12723/mjs.sp3.0

Editorial

We are very proud and honored to have been entrusted to edit this special issue "Artificial Intelligence in Biometrics". This special issue consists of extended version of the selected 9 articles which were presented in the conference - XVI Biennial Conference of International Biometric Society (Indian Region), Artificial Intelligence in Biometrics (AIIB23) held during 30th - 31st March 2023. In AIIB23 papers were sought to cover comprehensively the most important directions of research work in Artificial Intelligence in Biometrics. These selected 9 articles will enhance research works in the vicinity of Artificial Intelligence in the domain of biometrics.

In the article, "Distributed Artificial Intelligence for Remote Patient Monitoring," Sathyanarayana delves into the transformative potential of integrating cutting-edge technologies in stroke care. With a focus on AI, remote monitoring, and telemedicine, the author underscores the pivotal role these advancements play in enhancing diagnostic accuracy, reducing treatment delays, and ultimately saving lives, particularly in remote settings. By advocating for collaborative efforts among healthcare professionals and emphasizing the paramount importance of data security, this work lays the foundation for a future where high-quality healthcare is more accessible than ever before.

Sahu and Mantri's pioneering investigation delves into the realm of diabetes prediction, propelled by the integration of Artificial Intelligence (AI) technology. Their scholarly endeavour accentuates the indispensability of personalised strategies in diabetes management, acknowledging the nuanced interplay of individual responses to interventions. The study navigates through the intricate landscape of AI applications in healthcare, confronting challenges in result reproducibility while illuminating the profound advantages of AI-driven diabetes management tools. This exploration beckons readers into a realm where innovation converges with necessity, heralding the dawn of a new era in diabetes care marked by precision, efficacy, and transformative potential.

In the landscape of predictive analytics for heart failure mortality, Mukherjee *et al.'s* seminal work offers a comprehensive examination

of traditional statistical methods versus modern machine learning models. Their comparative study delves into the efficacy of the 'Cox Proportional Hazard Model' alongside advanced techniques like Random Survival Forest and Gradient Boosted Model. Through meticulous analysis of patient data spanning a significant period, the authors reveal a noteworthy finding: the superiority of the Cox Proportional Hazard Model in forecasting outcomes. This introduction beckons readers into a discourse that not only underscores the enduring relevance of classical statistical approaches in survival analysis but also prompts critical reflection on the ever-evolving landscape of predictive modeling in healthcare.

Mahapatra and Joshi's groundbreaking research illuminates the path towards enhanced heart disease prediction using machine learning methodologies applied to the Framingham dataset. Their study illuminates the potential of machine learning in revolutionizing healthcare outcomes, particularly in regions burdened by high rates of cardiovascular diseases. By harnessing the power of advanced algorithms and data analytics, this research offers a beacon of hope for improving patient care and mitigating the mortality toll of heart diseases. This exploration invites readers into a transformative dialogue at the intersection of technology and healthcare, underscoring the pivotal role of machine learning in shaping the future of preventive medicine.

In an era marked by the rapid advancement of artificial intelligence and machine learning, the realm of healthcare claims fraud detection stands at a critical juncture. Naib *et al's* insightful article sheds light on the indispensable role of augmented AI/ML systems in this domain. By advocating for the fusion of human expertise with cutting-edge technology, the authors underscore the imperative of domain-specific knowledge and adaptability to seasonal variations in healthcare data. Their discourse on the challenges posed by opaque deep learning models underscores the necessity for transparency and effective communication in decision-making processes. This preface invites readers to delve into a discourse that not only examines the need for augmented AI/ML systems in healthcare fraud detection but also advocates for a harmonious synergy between human insight and technological innovation.

In the realm of medical imaging, where precision and efficiency are paramount, R. Kumar and Arulkumar's pioneering research on Self-Supervised Contrastive Learning (SSCMIRG) illuminates a path towards transformative innovation. Their trailblazing work underscores the profound significance of self-supervised learning techniques in extracting high-level features from medical images, obviating the need for extensive labelled data. By harnessing the power of contrastive learning, their SSCMIRG algorithm not only revolutionizes classification processes but also opens new vistas for automatic report generation, streamlining diagnostic workflows. This exploration beckons readers into a realm where cutting-edge deep learning methodologies converge with clinical imperatives, offering unprecedented opportunities to enhance diagnostic accuracy and ultimately improve patient care. As we embark on this journey of exploration, we witness the dawn of a new era in computer vision and medical imaging, propelled by the transformative potential of self-supervised learning.

In their pursuit of advancing diabetes diagnosis and management, Sasidharan and Arulkumar embark on a journey into the intricate realm of DNA sequence classification. Their study endeavours to unravel the genetic underpinnings of Type-2 diabetes by meticulously scrutinizing gene variants within the insulin protein. Introducing a groundbreaking machine-learning model, the authors aim to refine the identification process of Type-2 diabetes by categorizing DNA sequences linked to the insulin gene. Through rigorous investigation and meticulous comparison with existing models, their work offers promising insights into enhancing predictive capabilities based on genetic data. This preface invites readers into a realm where innovative methodologies intersect with the imperative of personalized healthcare, illuminating the potential of genetic analysis in shaping diabetes prognosis and treatment strategies.

Thamarai Selvi and Sandanasamy present an innovative solution in their article, "Deep Learning Facial Recognition System for Student Attendance." This system employs state-of-the-art techniques such as the Haar cascade for face detection and LBPH for histogram creation, ensuring rapid and precise facial recognition. By utilizing facial photos and unique IDs for student enrolment, the

system revolutionizes attendance tracking in educational institutions. Through automatic updates to attendance records in Excel documents, it not only saves time but also minimizes human errors, thereby enhancing efficiency and accuracy in attendance management.

In the ever-evolving landscape of mental health treatment, Chakrabarti *et al.'s* meticulous research stands as a beacon of insight and guidance. Their systematic review and meta-analysis traverse the intricate realms of pharmacotherapy, psychotherapy, and combo-therapy in the realm of depression treatment. Through rigorous examination, their study unveils the potency of combo therapy, shedding light on its superior efficacy in alleviating depression scores compared to monotherapy approaches. This introduction invites readers into a realm where empirical evidence meets clinical practice, offering invaluable insights to healthcare professionals navigating the complexities of depression treatment. As we embark on this journey of exploration and discovery, we glimpse a path towards optimized care and enhanced well-being for those grappling with depression.

With the publication of another edition of Mapana Journal of Sciences, we would like to express our sincere thanks to all the authors, reviewers, editors and section editors who contributed to the completion of this publication. This publication covers the vast applications of AI. Mapana is proud to participate in the essential efforts that promote scientific culture and research.

We look forward to future projects of knowledge and discovery. MJS continues to provide its readers with the latest information o various fields of scientific research and serve as a forum for the exchange of research ideas and discoveries.

Editors

Dr Deepthi Das
Dr Rajesh R
Dr Rupali Sunil Wagh