



Editorial

Dear Readers,

Research and innovation have always been part of a developing society, and they play a critical role in putting forth revolutionary thoughts, ideas, and discoveries. The Mapana Journal of Sciences (MJS) has been constantly rendering quality research works over the years providing validation and recognition to insightful explorations. The editorial team of Mapana Journal of Sciences is here with its fourth issue of 2024, showcasing active research in the fields of materials science, life sciences, forensics, mathematics, and computer science.

This issue of MJS opens with a review article by Singh et al., based on magnetic-field assisted ablation and subsequent plasma production by laser, including its various physical phenomena. This systematic review sheds light on the progressive research done on the effect of magnetic fields in removing materials using laser. In the field of mathematical physics, Abraham et al., explore the effects of PT-symmetry on a matrix polynomial, along with its behaviour at different points of the mathematical space. This paper also focuses on how PT-symmetry works at the points where the polynomial equals zero. Material science is an ever-evolving cutting-edge research field due to its immense direct impact on current technologies. Theoretical-based studies play a vital role in effective material research, based on which Gounhalli et al., analyzed the PPD laser dye using DFT and TD-DFT with 6-311G++(d, p)/B3LYP basis set. The potential use of this material in optoelectronic materials is also identified owing to their low HOMO-LUMO gap and the presence of regions for electrophilic and nucleophilic interactions. The work done by Chikte et al., focuses on hydrolyzing waste nylon-66 into useful dibenzoyl derivatives using ionic liquids as efficient catalysts. [emim]BF₄ is seen to exhibit the best results with the highest catalytic efficiency, among other ionic liquids like [bmim]BF₄ and [bmim]PF₆. An interesting work in the field of biometric identification under forensic studies is done

by Biswas et al. by examining dorsal finger knuckle crease patterns. Their application extends to sex determination based on the average distance between the knuckle creases. Under life sciences, the antibacterial properties of *Andrographis paniculata* extracts are studied by Raphael et al., against *E. faecalis* and *K. pneumoniae*. The potential for utilizing Andrographolide as an effective drug-like component in therapeutics against antibiotic-resistant pathogens is explored in this work. Lately, AI technologies like ML, NLP, and robotics have picked up the limelight in the field of research and innovation. Thereby Rajalakshmi et al., explored the challenges faced in detecting fake content in Tamil news articles using basic NLP tools and traditional machine learning models, including logistic regression, support vector machines (SVM), naive Bayes, k-nearest neighbours (KNN), decision trees, random forests, and passive-aggressive classifiers. An interesting finding is made by Archisa et al., in developing HelenHands, an Android application tool for a range of features, like Virtual White Cane for spatial awareness, Let's Chat for real-time sign language translation, SOS Reach for emergency assistance, and the Wellness Aware-Enabler for promoting proactive health behaviours, along with step by step illustration of the same. Rajeev et al., look into various graph invariants like connectivity, minimum degree, independence number, matching number, covering numbers, and chromatic numbers of the identity graph wherein the greatest common divisor is not 1. Under graph theory and topology, Eswari et al., used simple digraphs to define fuzzy crisp set, intuitionistic crisp set, and neutrosophic crisp set. The work also extends to relative topology by incorporating this concept into induced subgraphs. It further relates separation axioms on digraphs to topological separation axioms.

As we present this issue of our journal, we offer our deepest appreciation to all authors, reviewers, and editorial board members who have contributed to MJS. We are elated to maintain the consistency of our publications with effective contributions to the scientific community. We hope that this issue of MJS brings enlightening insights and valuable perspectives to the readers, promoting further research and advancements in the respective fields.

Dr Manoj Balachandran
Editor