

## Editorial

In the rapidly evolving landscape of modern science and engineering, four groundbreaking studies offer insights into diverse yet interconnected fields. From biomedical engineering to statistical estimation in sales, magneto-optical qubits, and sustainable requirements engineering, these research papers highlight the strides made in their respective domains.

The first study delves into biomedical engineering, a field that has revolutionized solutions for complex biological problems through the application of engineering principles. This research focuses on hip joint replacements, particularly the comparative analysis of hip replacement implants made from stainless steel (SS) and titanium alloy (Ti6Al4V). Utilizing advanced 3-dimensional finite element analysis with ANSYS2020 and Fusion 360 for modelling, the study evaluates the von-Mises stress, stress locations, and deformation under directional loads. By comparing static structural analysis with different materials and neck angles, this paper provides invaluable insights into the performance of hip prosthesis implants, offering a foundation for future research and improvements in implant design [1].

The second paper addresses the critical aspect of product life cycles, emphasizing the importance of accurate sales data estimation. Using Walmart sales data from 45 stores over 2010-2012, the study explores the integration of additional information—both unbiased and possibly biased—into statistical estimations to enhance accuracy. By minimizing mean squared error and variance, the research illustrates how incorporating external data can refine estimates of weekly sales and account for phenomena such as the holiday effect. This approach not only advances statistical methodologies but also provides practical applications for businesses aiming to optimize their sales strategies [2].

In the realm of quantum computing and information processing, the third paper investigates the properties of magneto-optical qubits through the Faraday rotation effect. The study proposes innovative waveguide geometries for developing various information processing and transmission devices, including logic gates with new architectures. By modeling magneto-optical logic elements capable of performing parallel AND, XOR, and other operations, this research paves the way for a new generation of quantum devices. The potential applications of such devices span multiple fields, from scientific research to industrial processes, underscoring the transformative impact of magneto-optical technologies [3].

Finally, the fourth paper explores the evolving field of Requirements Engineering (RE) with a focus on sustainability. The proposed approach, CRESustain, integrates sustainability dimensions into the RE process by employing creativity techniques inspired by the Sustainable Development Goals, creative problem-solving methods, and the Karlskrona Manifesto. Using Design Science Research methodology, the study demonstrates how CRESustain can foster discussions on sustainability across technical, economic, social, human, and environmental dimensions. This approach not only enriches the RE process but also aligns software development with broader sustainability goals, addressing the pressing need for sustainable practices in the tech industry [4].

Together, these studies showcase the innovative spirit and interdisciplinary nature of contemporary research. They not only advance their respective fields but also contribute to a deeper understanding of how technology and creativity can address complex challenges in medicine, business, quantum computing, and software engineering.

### References:

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**Editor-in-chief**

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