

The Evolving Role of Science, Engineering and Technology in an AI-Driven World

S. L. P. Yasakethu*

Computational Intelligence and Robotics (CIR) Research Group, Faculty of Engineering, Sri Lanka Technology Campus (SLTC), Padukka, Sri Lanka.

ORCID: 0000-0002-9571-6866

Artificial Intelligence (AI) has become a powerful factor that changes the course of development in science, engineering, and technology. The emergence and rapid growth of the field of AI have resulted in significant modifications in the tools and technologies used by scientists, engineers, and technicians in the industry. Moreover, AI is a driving factor that alters how researchers approach challenges, process information and find solutions to them, thus becoming a crucial part of modern innovations and achievements in different industries.

As far as the field of science is concerned, AI helps to process increasingly complex amounts of data much more efficiently than was possible before [1]. Nowadays, scientists collect an enormous amount of data during their experiments, observations and even simulations that cannot be analyzed with the help of traditional methods. As a result, the involvement of AI allows researchers to analyze these datasets, find specific patterns and make predictions based on the information collected. Therefore, there is no doubt that AI significantly contributes to the advancements across a wide range of fields, including medicine, environmental research, climatology, agriculture, material science, engineering, transportation, education, manufacturing and many other scientific and technological domains [2].

It is crucial to understand that AI should not be seen as an alternative to established scientific methods. AI is a technological instrument that augments the effectiveness and applicability of conventional scientific methodologies by adding a data-driven dimension to research. Thus, scientific reasoning, human knowledge and analytical thinking are still indispensable aspects of any scientific endeavor.

The purpose of AI is to facilitate the process of scientific inquiry by improving its effectiveness, scale and rigor, allowing researchers to obtain novel findings and insights.

From an engineering perspective, AI contributes to the ongoing shift from traditional engineering designs towards more intelligent, flexible and autonomous systems [3]. In modern engineering applications, there is an increased demand for systems capable of functioning in unpredictable circumstances, where continuous decision-making, real-time learning and adaptation become vital factors. Similar developments can be observed in robotics, autonomous transportation, industrial automation, intelligent manufacturing and cyber-physical systems. Here, in addition to applying advanced engineering practices, system designers need to consider the ability of engineering systems to acquire knowledge and behave intelligently within dynamically changing environments.

On the other hand, the convergence of AI with new technologies including internet of things (IoT), cloud computing, edge computing, and advanced communication systems is giving rise to intelligent and highly inter-connected ecosystems [4]. This can be seen in the form of applications like smart cities, intelligent transportation systems, digital health care platforms and smart grids. Such a combination has the ability to significantly enhance productivity, sustainability, efficiency and quality of life. However, at the same time, it poses many challenges relating to security, privacy, dependability, accountability and ethics of the use of advanced technologies.

It is important to appreciate in this regard that the responsibilities of the science, engineering, and technology community go well beyond the purely technical aspects involved here.

*Corresponding author. E-mail address: lasithy@sltc.ac.lk (S. L. P. Yasakethu)

Not only do we need researchers and engineers who can build state-of-the-art technologies, we also require professionals with the expertise to accomplish the tasks ethically and responsibly. This will involve not only technical skills, but also inter-disciplinary thinking and critical perspectives. Therefore, universities and research communities can play a pivotal role in shaping future professionals equipped with such skills.

The Journal of Emerging Science, Engineering and Technology (JESSET) provides an important platform to support this direction. With its encouragement of high-quality and multidisciplinary research, the platform can provide avenues for fruitful scholarly discussion that could result in beneficial innovation for both industry and society. In a world that is becoming more and more AI-driven, platforms like JESSET should play a critical role in ensuring that research in technology takes an ethical turn towards benefiting humanity.

As the first edition of the Journal of Emerging Science, Engineering and Technology (JESSET), this edition represents a significant landmark in the effort by the journal to serve as an excellent multi-disciplinary forum for the sharing of scientific, engineering, and technological information. This journal seeks to encourage academic discussions, stimulate innovation, and facilitate the creation of knowledge that is beneficial to industry, society, and humankind.

The articles presented in this edition feature a varied array of emerging topics in science, engineering, and technology. This edition features articles that capture the modern-day trends and innovations being practiced in different fields of study. The current edition features sixteen research papers, one editorial paper, and one correspondence paper.

The Editorial Board would like to take this opportunity to express its gratitude to all who made the publication of this issue possible. Our gratitude goes out to the authors for entrusting their scholarly contributions to JESSET, the reviewers for the time, effort, and expertise they have invested in ensuring the quality of published articles, and members of the Editorial Board and Advisory Board for their advice and guidance during the preparation of this issue. The contribution of the typesetting team and the administrative team deserves special mention here for their dedication and professionalism which made the publication of this issue possible. Finally, we gratefully acknowledge the encouragement and support provided by the institutional leadership of Sri Lanka Technology Campus (SLTC), whose vision and commitment to research excellence have been fundamental to the establishment of JESSET.

It is our expectation that the contributions made in this issue will help initiate future research and interdisciplinary studies towards the advancement of science, engineering, and technology.

- [1] Y. LeCun, Y. Bengio, and G. Hinton, "Deep learning," *Nature*, vol. 521, no. 7553, pp. 436–444, 2015.
- [2] P. Dhar, "The impact of artificial intelligence on healthcare: A review," *Artificial Intelligence in Medicine*, vol. 102, 2020.
- [3] K. Schwab, *The Fourth Industrial Revolution*. Geneva, Switzerland: World Economic Forum, 2016.
- [4] L. Da Xu, W. He, and S. Li, "Internet of Things in industries: A survey," *IEEE Transactions on Industrial Informatics*, vol. 10, no. 4, pp. 2233–2243, Nov. 2014.



Articles in the Journal of Emerging Science, Engineering and Technology (JESSET) are Open Access articles published under the Creative Commons CC BY-NC-ND 4.0 License(<https://creativecommons.org/licenses/by-nc-nd/4.0/>). This license permits the sharing, distribution, and reproduction of the original work in any medium for non-commercial purposes, provided that appropriate credit is given to the author(s), the original work is properly cited, and the work is not modified, adapted, or altered in any way.