

Special Issue: “AI Based Applications in Engineering Sciences”

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Call for submission. This editorial introduces the issue of 2025 for *Embedded Selforganising Systems (ESS)* journal. This issue focuses on *AI Based Applications in Engineering Science*, which has emerged as one of the most dynamic interdisciplinary fields of the decade.

The motivation for publishing this special issue comes from the increasing demand to integrate knowledge from different engineering domains. Researchers from structural and material engineering, as well as computer science fields such as cybersecurity and artificial intelligence, have collaborated to address the challenges of the digital and physical world. This diversity of perspectives provides fertile ground for innovation and highlights why a dedicated volume is essential.

We are welcoming fresh ideas, on-going research technical reports and novel scientific works. We also intend to create a promising platform for creative and constructive discussions.

AI Based Applications in Engineering Sciences

Artificial Intelligence (AI) is rapidly transforming the field of engineering science, reshaping the way we design, monitor, and optimize complex systems. From material discovery to security protocols and advanced image recognition, AI-driven technologies are opening unprecedented opportunities to solve persistent challenges. By combining data analytics, machine learning, and intelligent automation, AI is driving innovation in building materials, ensuring cybersecurity in digital infrastructures, and revolutionizing image processing applications.

AI technologies are no longer confined to software applications alone. They now play critical roles in several key engineering domains (but are not limited to):

- In the field of cybersecurity, AI contributes to real-time detection of cyber threats, anomaly identification, and automated response systems. Deep learning techniques are particularly powerful for recognizing sophisticated and previously unseen attacks, enhancing the reliability of digital infrastructures in cybersecurity.

- In construction materials and structural engineering, AI is applied to optimize the composition of concrete and other eco-materials. Machine learning algorithms are increasingly used to predict the load-bearing capacity and reliability of structures, assisting in early fault detection and improving the resilience of infrastructures. This integration reduces costs while extending the lifecycle of engineering assets.

- In the medical field, the use of machine learning algorithms has elevated image processing to a new level, enabling more precise object detection and image recognition, and thereby supporting early disease detection and accurate diagnosis.

- In general engineering systems, AI supports predictive maintenance, system optimization, and intelligent monitoring. It enables engineers to identify risks before they occur, reduce downtime, and optimize energy and resource usage. Such applications highlight the importance of AI as a partner in sustainable and efficient engineering practices.

Therefore, this special issue serves as a platform to present research results where computational intelligence meets engineering practice. By bridging domains, this issue emphasizes that AI is not merely a tool, but a co-actor in solving pressing engineering challenges. The presented studies demonstrate how interdisciplinary cooperation leads to solutions that are faster, safer, and more sustainable, highlighting the significance of this collaborative endeavor.

We invite contributions including original research papers, case studies, reviews, and applied works that demonstrate the transformative role of AI in engineering sciences.

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SUBMISSION INSTRUCTIONS

Submissions for the journal must be made as complete papers (there is no abstract submission stage) submitted as PDF documents. Authors are requested to submit papers reporting original research results and experience. The page limit for regular papers is 4 to 6 pages and short papers are from 2 to 4 pages. Papers should be prepared using the IEEE two-column template. An MS Word template or ESS online journal is available here <https://www.bibliothek.tu-chemnitz.de/ojs/index.php/cs/information/authors>

Papers should submit the following link of the journal:

<https://www.bibliothek.tu-chemnitz.de/ojs/index.php/cs/about/submissions>

Submission period: Opening 25th August 2025 and Closing 30th November 2025.

There is no charge for submission. Accepted papers are publishing free. Review in 2 weeks after submission. Camera-ready paper for publication should be submitted in 2 weeks after review notes.

Thank you for Your Contribution!