Editorial

The Journal of Engineering Research and Sciences (JENRS) continues to highlight research that addresses emerging challenges through innovative computational methodologies and systematic scientific inquiry. The contributions presented in this issue demonstrate the value of combining intelligent computational techniques with rigorous evaluation methodologies to improve engineering design processes and strengthen the understanding of human-centered technology research. Together, these studies provide insights into both the automation of complex engineering tasks and the methodological development of usability, user experience, and accessibility evaluation.

The increasing integration of machine learning into analog integrated circuit development has created new opportunities for accelerating circuit sizing, optimization, and pre-silicon verification, while the computational cost of generating simulation-based training data remains a significant bottleneck. A metamodel-based optimization approach employing adaptive sampling is presented to construct accurate machine learning representations while reducing the number of required circuit simulation samples. Comparative evaluation against random and Latin hypercube sampling demonstrates improved model quality for equivalent sampling budgets or error constraints. Application to single-stage and two-stage operational amplifier optimization further shows that the proposed metamodel-based strategy achieves results comparable to classical simulation-driven optimization, indicating its potential to reduce computational demands without compromising optimization performance. [1]

The systematic assessment of usability, user experience, and accessibility is examined through an extensive review of 582 case studies published between 2014 and 2023. The analysis reveals the continued prominence of usability evaluation, with the System Usability Scale remaining the most widely adopted instrument, while UX has increasingly developed as a distinct research area supported by standardized instruments such as the User Experience Questionnaire. At the same time, accessibility remains comparatively underrepresented, and the continued reliance on single-method approaches and ad-hoc, insufficiently validated questionnaires highlights important methodological concerns. Comparison with previous tertiary research further identifies persistent gaps, including limited integration of usability, user experience, and accessibility within unified evaluations, insufficient longitudinal investigation, geographic concentration, and the need for greater methodological rigor. The findings provide a valuable foundation for strengthening future UAUX research and establishing more comprehensive evaluation practices. [2]

The two contributions collectively demonstrate how engineering research can benefit from both computational efficiency and methodological rigor. The development of adaptive machine learning metamodels offers a pathway toward more efficient engineering design and optimization, while the systematic examination of UAUX research provides evidence for improving the quality, inclusiveness, and reliability of human-centered technology evaluation. Together, these studies reinforce the importance of innovation that not only improves technical performance but also strengthens the methods through which engineering systems and technologies are designed, evaluated, and applied.

References:

[1] V. Grosu, N. Patache, E. David, "Metamodel based Optimization for Analog Integrated Circuits," *Journal of Engineering Research and Sciences*, vol. 5, no. 7, pp. 1–15, 2026, doi:10.55708/js0507001.

[2] J.A. Brenes, H. Solis-Ramirez, I. Diaz-Oreiro, G. Lopez, "The State of Usability, User Experience and Accessibility (UAUX) Evaluation: A Systematic Review of 582 Case Studies," *Journal of Engineering Research and Sciences*, vol. 5, no. 7, pp. 16–42, 2026, doi:10.55708/js0507002.

Editor-in-chief

Dr. Jinhua Xiao