ESCUELA NAVAL DE CADETES
"ALMIRANTE PADILLA"
Honor y Tradición

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Editorial

Engineering as the Axis of Naval Education and Technological Development

La Ingeniería como Eje de la Formación Naval y el Desarrollo Tecnológico

It is with great satisfaction that I present this new volume, which reaffirms our journal's commitment to advancing research in Engineering and Technology, particularly in fields of direct relevance to naval science, maritime operations, and technological innovation. The works compiled here reflect the academic rigor, applied orientation, and institutional relevance that characterize the research ecosystem of the Escuela Naval de Cadetes "Almirante Padilla" (ENAP).

A first group of studies focuses on technologies that enhance operational readiness and instructional quality through simulation, immersion, and human–system interaction. These works address the development of motion-based training environments, the study of virtual reality principles, and the design of pedagogical tools for sensor evaluation in IoT settings. Together, they demonstrate how high-fidelity simulation and digital instrumentation reduce training risks, improve skill acquisition, and expand the Academy's capacity to prepare officers for complex operational environments; particularly those requiring precision, situational awareness, and doctrinal alignment. Such developments strengthen ENAP's long-standing leadership in integrating emerging technologies into naval education.

A second thematic cluster centers on the design and optimization of intelligent systems capable of supporting modern computational and energy demands. The research on network optimization using software-defined networking, machine learning, and adaptive QoS strategies reflects growing needs for resilient communication infrastructures in defense, logistics, and academic systems. In parallel, contributions addressing fuzzy-logic-based control for alternative energy sources highlight the importance of efficient, autonomous, and sustainable energy solutions for maritime and coastal operations. These advances not only align with global technological trends but also support ENAP's institutional mandate to innovate in systems that enhance security, autonomy, and operational efficiency.

A third group examines engineering solutions to improve safety, reliability, and technical performance in operational environments. Research addressing the design of testing systems for high-pressure components, as well as studies that strengthen methodological planning in software development, exemplify the applied orientation that guides much of the Academy's technological work. These contributions provide tools that enhance preventive maintenance, operational safety, and procedural accuracy; critical aspects in naval infrastructures, diving operations, and technological projects that support Colombia's maritime authority.

Collectively, the studies in this issue underscore the strategic role of engineering and technology in supporting naval capabilities, strengthening academic excellence, and fostering innovation within ENAP. They reaffirm the Academy's mission not only as a center for military leadership, but also as an institution that contributes scientific and technological solutions of national relevance.

As Editor-in-Chief, I extend my appreciation to the authors, reviewers, editorial committee, Dean of research and doctoral studies, and collaborators whose rigorous work made this volume possible. Their contributions reinforce the scientific standing of our journal and continue to position the Escuela Naval de Cadetes "Almirante Padilla" as a leading institution in the country's naval and technological advancement.

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