Editorial

Technological advancement continues to drive innovation across industries from software engineering and industrial automation to healthcare. These studies exemplify how critical thinking, strategic design, and computational technologies converge to address modern challenges in quality assurance, operational safety, and medical diagnostics. By drawing from structured methodologies and harnessing the power of digital tools, these works lay the foundation for future-ready systems that prioritize reliability, accessibility, and intelligent performance.

Ensuring the integrity and quality of software is an indispensable task in the software development life cycle (SDLC). This study examines the intricate dynamics of software testing through a qualitative lens, guided by Structuration theory. By analyzing the social and organizational structures influencing testing practices, it identifies five key insights: the centrality of testing for software quality, the importance of communication and collaboration among project stakeholders, the influence of power hierarchies on decision-making, the necessity of adherence to standards and processes, and the legitimization of the testing role within teams. The study demonstrates that software testing is not merely a technical activity but a socially embedded process requiring structural support, clear role recognition, and collaborative governance to ensure defect-free and requirement-aligned products [1].

Precision in nuclear power infrastructure is paramount, especially in maintenance tasks involving inaccessible or hazardous environments. This paper presents the creation of a digital twin for a robotic inspection system designed to assess pipe wall thickness within turbine buildings. Utilizing Process Simulate software, the system integrates mobile, robotic, and service units to achieve automated ultrasound-based inspections. The research details the virtual commissioning process and the design innovations of the robotic arm's end-effector, enabling flexible, interpolated movement around complex geometries. Through laboratory prototyping and simulation, the system's operability across diverse configurations is validated, emphasizing the digital twin's value in improving commissioning accuracy, safety, and efficiency in industrial robotics applications [2].

Peripheral artery disease (PAD), a widespread vascular condition, demands timely and accurate diagnosis for effective treatment. This paper introduces the DECODE platform, a cloud-based diagnostic tool that combines machine learning, 2D/3D visualization, and data warehousing for non-invasive PAD evaluation. The system enables artery segmentation, reconstruction, and drug-coated balloon simulation within a scalable infrastructure, supporting clinicians with actionable insights. Notably, the multiplanar and 3D rendering modules achieve high performance scores, validating the platform's technical robustness and clinical utility. The DECODE system redefines PAD diagnostics by enhancing accessibility, improving decision-making accuracy, and setting a precedent for the integration of digital health solutions in vascular medicine [3].

These studies represent distinct but complementary perspectives on how technological systems are transforming essential sectors. From ensuring software quality and industrial safety to revolutionizing healthcare diagnostics, they underscore the value of combining technical innovation with strategic insight. As digital systems grow more interconnected and intelligent, the lessons and models presented here provide essential blueprints for the development of reliable, scalable, and human-centric solutions in an increasingly complex world.

References:

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