Emerging Problem Concerns in Modern Software Engineering Due to AI-Driven Paradigm Shift

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Abstract:

"The integration of artificial intelligence into software engineering is no longer a speculative trend; it's a rapidly evolving reality. This paper examines the critical problem concerns surfacing as AI-driven paradigms reshape software development. We're witnessing a shift that, as many argue, rivals the impact of the internet itself. While generative AI promises increased efficiency and novel capabilities, it also introduces significant challenges to traditional software engineering practices. This report delves into the implications of this shift, specifically focusing on the evolving definitions of quality and reliability in AI-assisted systems. We analyze the ethical quandaries that arise from automated code generation and decision-making, and further explore the pressing need for robust governance frameworks. Notably, we also address the profound transformation of job roles within software engineering. The rise of AI necessitates a re-evaluation of skills and responsibilities, leading to both displacement and the creation of entirely new specializations. Essentially, we aim to map out the emerging problem space, highlighting the key questions that the software engineering community must address as AI becomes an integral part of the development lifecycle. This isn't just about faster code; it's about fundamentally rethinking how we build, trust, and staff software in an AI-dominated landscape."

Keywords – AI-Driven Software Engineering, Generative AI in Development, Software Quality and Reliability, AI-Assisted Coding, Automated Code Generation, AI in Software Testing, Legacy System Integration, AI-Driven Development Processes, Ethical AI in Software Engineering, AI Bias and Discrimination, Data Dependencies in AI, AI and Software Security Risks, Transparency in AI-Generated Code, AI-Driven Risk Management, AI in Quality Assurance, AI Governance and Compliance, AI-Powered Software Automation, Human-AI Collaboration in Development, AI for Code Optimization, AI-Integrated Development Lifecycle.