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LLM Framework for Enhanced CI/CD Pipelines for Intelligent DevOps

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This paper introduces an AI-augmented CI/CD framework that integrates Large Language Models into traditional DevOps pipelines, addressing common operational challenges including build failures, alert fatigue, and deployment bottlenecks. Our approach reimagines LLMs as intelligent DevOps assistants rather than merely deployment targets. Through systematic evaluation across multiple enterprises, we demonstrate that our framework reduces Mean Time to Recovery (MTTR) by 76%, decreases alert volume by 75%, and increases developer productivity by 35% with minimal operational overhead. We provide detailed mappings between DevOps processes and specialized LLM capabilities, along with implementation patterns that can be integrated into existing CI/CD tools. Our work establishes a new paradigm for embedding AI assistance directly into development workflows, creating more resilient systems while improving the overall developer experience.