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AI Collaborative Code Editor: A Next-Generation Smart Development Environment

Anas Khalid Khan, Sameer Ahmed Shaikh, Arsal Hashim Ansari
Students, Department of IT
M H Saboo Siddik College of Engineering, Mumbai, India

Abstract: *In today's increasingly complex and distributed software development landscape, the demand for intelligent and collaborative programming environments is rapidly growing. This research introduces a next-generation AI-driven Collaborative Code Editor designed to enhance the development process by merging real-time team collaboration with smart coding assistance. Utilizing advanced technologies such as large language models (LLMs), natural language processing (NLP), and live communication protocols, the editor provides features like intelligent code completion, automated summarization, real-time error detection, and adaptive suggestions. The platform facilitates seamless multi-user interactions, integrated code reviews, and version control powered by Git, making it ideal for both startup teams and enterprise-level projects. A comparative study against leading tools like GitHub Copilot and Visual Studio Live Share demonstrates notable improvements in team productivity, code quality, and collaborative efficiency. This paper details the system's architectural framework, technical implementation, and experimental evaluation, while also discussing the challenges and potential enhancements for future AI-integrated development ecosystems.*

Keywords: Collaborative Code Editor, Artificial Intelligence, Large Language Models, NLP, Real Time Programming, AI Programming, Intelligent Code Review ,Software Development Tools

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