Cloud-Powered AI Platform for Vulnerability Detection in Open-Source Software

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Abstract

Open-source software is used everywhere, but keeping it secure is a big challenge. Many projects don't have dedicated security teams, so finding and fixing vulnerabilities takes too long. Current tools can spot some problems but don't offer automatic solutions, leaving developers to fix issues manually, which slows things down. This problem grows as open-source projects get bigger and more complex. We propose a cloud-based AI platform that uses advanced machine learning to find vulnerabilities and create fixes instantly. The system analyzes code like a language, spotting patterns that older tools miss. It's trained on huge datasets of open-source code, getting better at finding issues over time. For fixes, it uses a smart system that suggests solutions and checks if they're safe. It also learns from past fixes to improve future ones. The platform works across different programming languages and runs in the cloud, so it can handle large projects quickly. Developers can access it easily through web tools or APIs, making it simple to use, even for small teams without powerful computers. This solution aims to make open-source software safer by reducing manual work, speeding up fixes, and strengthening security for everyone.

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Index Terms—Cloud Security, Vulnerability Detection, Machine Learning, Code Analysis, Automated Fixes, Open-Source Software, AI Security Tools.