

# Optimizing Test Automation with Selenium for Enhancing Web Application Quality

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**Abstract:** *A comprehensive study on Selenium, a widely-used tool for automating web applications for testing purposes, is presented. By examining various methodologies, frameworks, and implementations from existing research, the paper highlights the advantages of Selenium in enhancing software testing efficiency and reliability. The analysis includes case studies on Selenium's application in cloud environments, cross-browser testing, and integration with continuous integration/continuous deployment (CI/CD) pipelines. This work provides a detailed understanding of Selenium's capabilities, challenges, and best practices, contributing to the ongoing advancements in test automation technology.*

**Keywords:** Selenium, Automation testing, Web Application, Cross Browser testing, CI/CD Integration