

Exploring Feature Implementation in Open Source Software Projects Using GitHub API

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Master thesis in Computer Science

Feature branches have become integral to modern software development workflows, providing isolated environments for feature implementations and enabling distributed development in open-source software (OSS) projects. This thesis investigates feature branch development in OSS, with a focus on contributor performance and predictive factors by which high-performers can be distinguished from low-performers. Data from GitHub repositories was analyzed to explore the characteristics of feature branches and contributor dynamics. The findings reveal that feature branches exhibit higher commit activity, shorter lifespans, and more concentrated contributor efforts than non-feature branches. High performers contribute the majority of commits and consistently outperform their peers, as indicated by more commits, opened issues and pull requests. In contrast, low performers focus more on reviews and exhibit lower overall engagement. Key predictors of performance include issues, pull requests, followers, and repository popularity (stars and forks). High performers have greater visibility and impact within the GitHub community, and their success can be anticipated by analyzing historical contributions and social influence. These insights offer guidance for project maintainers in their task allocation and contributor management, emphasizing early identification and support of high performing contributors and finding ways of enhancing the involvement of low performing contributors.

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