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Two new tools, Historage and Kataribe, are set to improve the productivity of many software companies.

Software design

Method histories made easy

Two new tools make it easier for developers to browse method histories and extract important information from source codes

The code repository is one of the most valuable tools in software development because it contains everything there is to know about the source code — including, but not limited to, bug reports, developer messages and file histories. Despite its usefulness, however, retrieving method histories (also known as fine-grained histories) from the data-rich code repository has never been easy.

To overcome this problem, Hajimu Iida and co-workers at NAIST have developed 'Historage', a code repository specifically designed to store fine-grained histories; and 'Kataribe', a hosting service for Historage repositories[1]. Together, these technologies make it easier for developers to browse method histories on the web and extract important information from source codes.

Iida and co-workers built Historage from Git, an open source distributed revision control system designed to handle everything from small to very large projects with speed and efficiency. Equipped with a superb branching system, Git can implement an almost endless number of workflows with relative ease.

The researchers developed a tool for converting a Git into a Historage repository. Historage stores method histories in much the same way Git stores file histories. For this reason, conventional mining software designed to extract file histories from Git repositories are equally applicable to extracting method histories from Historage repositories.

However, Historage is not so useful if developers cannot copy the code repository and have easy access to method histories. To tackle these issues, the researchers built Kataribe, a hosting service for Historage repositories that enables developers to browse method histories on the web and clone Historage repositories.

"We wanted Kataribe to be a developer-friendly web service," says Iida. "At the end, we decided to extend the existing Git hosting service (GitLab) to implement features of Kataribe, and that implementation had been a great challenge."

Iida and co-workers at NAIST's Graduate School of Information Science praised the institute for providing a cloud platform that facilitated the development of Kataribe. They could easily create a testing server using the computational resource without having to go through formal procedures. Several researchers have already used Kataribe to successfully reconstruct method histories.

The team plans to further the capabilities of Kataribe by expanding its dataset, web services and functionalities. In fact, they have already implemented a visualization feature for displaying the semantics of changes in the commit snapshot of a Historage repository. The innovative technologies are set to promote the reuse of source code and improve the productivity of many software companies.

Reference

1. Fujiwara, K, Hata, H., Makihara, E., Fujihara, Y., Nakayama, N. *et al.* Kataribe: A hosting service of Historage repositories. *Proceedings of the 11th Working Conference on Mining Software Repositories* 380–383 (2014).

More information about the group's research can be found at the Software Design and Analysis Laboratory webpage:
http://isw3.naist.jp/Contents/Research/cs-06-en.html