Learning Management Systems based on Github – A Collaborative Coding Online Service

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Abstract

The software development industry is going through major changes in recent years. Among them are new tools for project management such as github.com[1]. This service is based on git – a distributed version control system[2]. Beyond managing source code versions, the service includes various project management tools, in particular social features which allow vast collaboration options. Other companies and services with different service models are bitbucket[3], Gitlab[4], SourceForge[5] and many others. Recently the use of such systems expands out of software engineering to many other areas[6].

Teaching usage: the idea to use such a service for educational purposes was already discussed (Wilson, 2011), and also with its limitations (Wilson, 2012). Github itself started collecting tools and manuals for such purposes[7]. A growing framework for migrating software engineering course is also in development[8].

A recent research (Zagalsky et al. 2015) gathered examples for github usage in education and interviewed 15 lecturers about it. The main usages that were reported are homework submission and course materials hosting. The motivations for using such a service that were collected are: activity transparency, participation encouragement, relevancy of the tools for industry, ease of use, collaboration options and versioning control for course materials.

Specifically, I'll focus on possible usages for a software engineering course:

- Course material hosting[9].
- Student project management (code, tasks and documentation).
- Code examples and assignment starter code.
- Exercise submission – in particular the pull request[10] mechanism allows for dynamic and open feedback and review.
- Evaluation – various tools and supporting services allow for evaluating team member contribution.

We will also discuss some limitations, among them:

- Usability issues with git (Perez De Rosso and Jackson 2013).

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[1] https://github.com
[2] http://git-scm.com
[3] https://bitbucket.org
[4] https://about.gitlab.com
[5] http://sourceforge.net
[6] http://www.wired.com/2013/09/github-for-anything
[7] https://education.github.com, https://classroom.github.com
[8] http://morea-framework.github.io
[9] https://github.com/jce-il/se-class/wiki
[10] https://help.github.com/articles/creating-a-pull-request

- Missing features and services in the particular platform, e.g., visualization for task management.
- Validity of measurement matrices. This is a long lasting issue is the software industry, e.g., (Jones, 1978).

To conclude, the use of github or a similar service, carries great benefits for academic courses, especially for software engineering and related fields. Currently these services are not friendly enough for general use. Another general issue to discuss is student assignments in an era of open and accessible knowledge. With proper use, such services can enhance courses and allow meaningful learning.

References

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