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Quick Git Setup

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QUICK GIT SETUP [*]

TUTORIAL PRESENTATION

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ABSTRACT

Version control is widely adopted in industry because it enables software development in groups, yet few students gain sufficient experience through their undergraduate courses. Even though version control is ideal for work submission, faculty may avoid it in favor of course management systems used only in academia. This tutorial introduces software to automate setting up version control with cloud project hosting services, and gives experience with version control as a side-effect of work submission and collection. This tutorial assumes no prior experience.

TUTORIAL

As recently as 2008, faculty using version control for course management had to administer servers, maintain student rosters, initialize repositories for each student, ensure sensible permissions, give each student secure access, and configure a web interface so students can confirm that faculty received their work, and so on. With the introduction of distributed version control systems and FERPA-compliant project hosting services such as Bitbucket, Github and Gitlab, faculty no longer need to spend time on any of these ancillary tasks. Even with these advances, version control systems are not tailored for course management like Blackboard or Moodle.

Since 2010, we learned best practices for course management using distributed version control systems with project hosting services in many computer science courses, including classrooms full of non-majors and freshmen. Early student feedback indicated that the main hurdle in using version control was setting it up, because of the tedious instructions that they had to follow within a two hour lab. Many students made mistakes that they had to address later in the semester. Recognizing the need for automation and

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error prevention, we wrote cross-platform shell scripts to set up Git properly on student and faculty machines alike. Now, setup rarely requires more than ten minutes. Despite this improvement, students need to understand what is going on, thus the scripts explain all setup steps.

The tutorial will begin by briefly introducing and motivating course management through distributed version control systems with project hosting services. Exposing students to version control early on is essential for them to gain practical experience and develop expertise. However, without automation, setting up version control is time-consuming and error-prone.

The tutorial will then introduce cross-platform shell scripts available at https://github.com/lawrancej/starterupper. Attendees will open their laptops to download and install Git, KDiff and Git frontends for their respective platforms (Git Extensions for Windows, GitX for Mac OS X, and QGit for Linux). We will also supply flash drives with all necessary software in case of internet connectivity issues. Attendees will use shell scripts to setup project hosting accounts, SSH public/private key pairs, and repositories structured as shown in Figure 1. These shell scripts are meant for faculty and students alike to use for their own courses.

We will then demonstrate how faculty can ask students to submit their assignments, and how to collect and review work easily using the supplied shell scripts. Finally, we will invite questions from attendees and conclude with questions and discussion. Tutorial participants will gain enough skill to adopt version control on project hosting services for their courses.
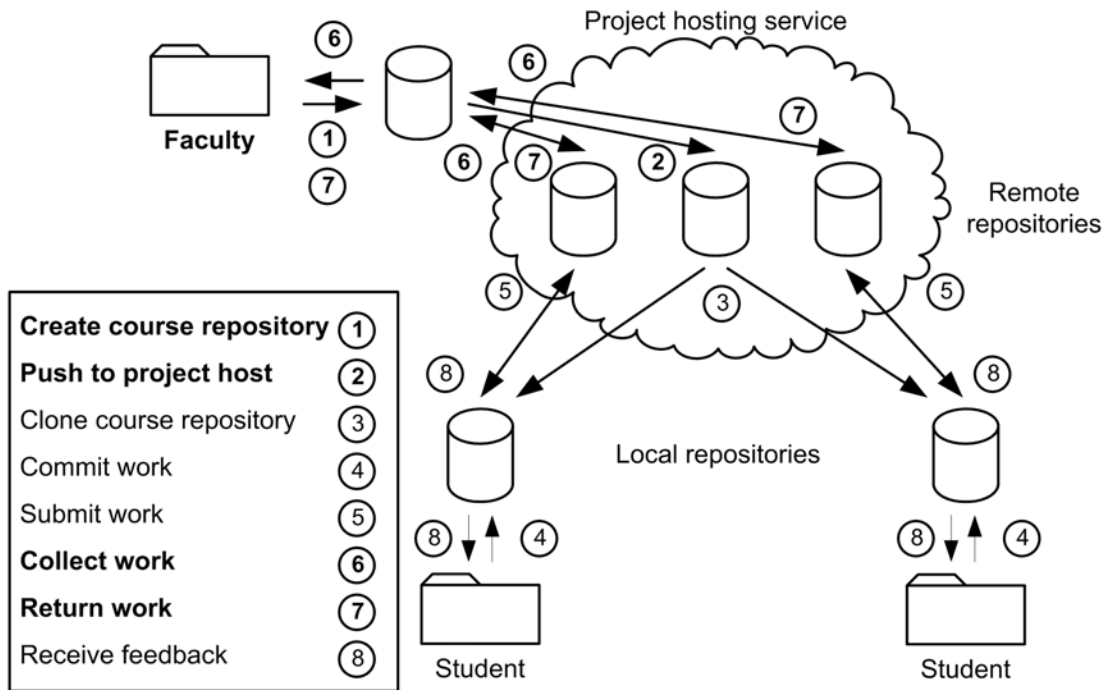

Figure 1. Using version control on the cloud for course management.

Joseph Lawrance is an Assistant Professor in the Department of Computer Science and Networking at Wentworth Institute of Technology, and has used Git and Github in all of his courses. Seikyung Jung is an Assistant Professor in the Computer Science Department at Bridgewater State University, and used Git and Bitbucket to manage her information retrieval course.