

MOOC for microcontroller design course

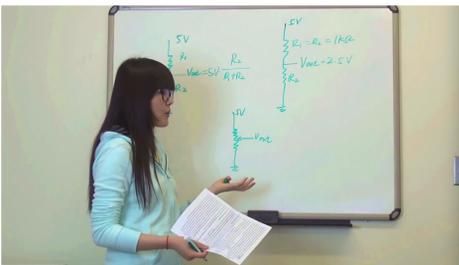
Yuanyuan Gong, Yun Hao, Mingming Dai, Junhao Dong, Yize Li

School of Electrical and Computer Engineering

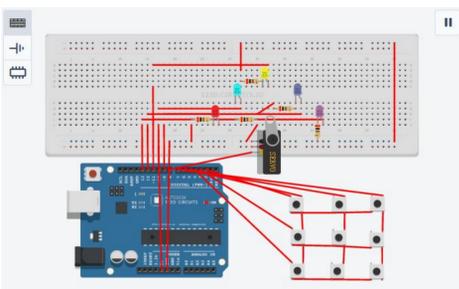
Abstraction

The design project is to develop a strategy for MOOC lab delivery and implement it for the course ECE 4760. MOOC means massive open online courses, and ECE 4760 is a lab-based microcontroller design course which uses hardware and software techniques to teach students a variety of design skills, culminating in a large design project. In order to let massive users take lectures and do labs and grade others' work online, we hook up 123d.circuits.io, a free online platform for developing and debugging electronic projects, to the content managing and homework grading system made by ourselves. The content management is realized with WordPress and Mysql, and the grading component is based on Web-based Peer Review grading method. Our goal is to let people around the world learn by doing and have fun.

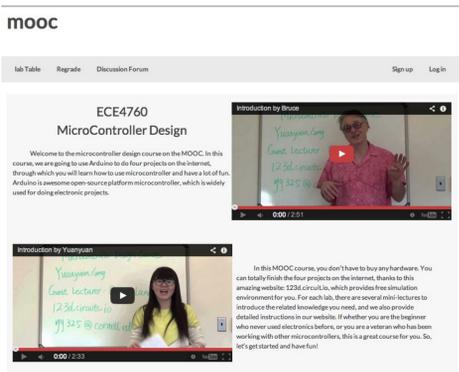
What did we do



We provide online lectures

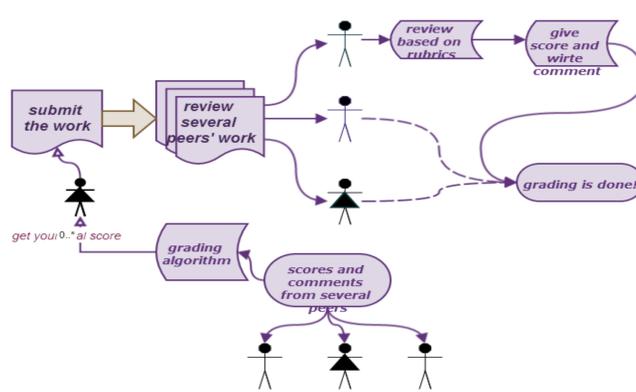


We find a way for people to do labs online



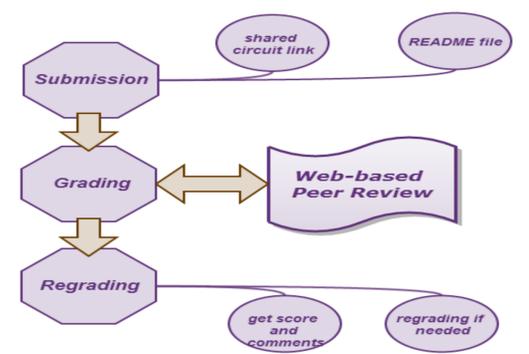
We build a content management and grading system for the course

Implementing peer review



Logic diagram for peer review

Grading Process

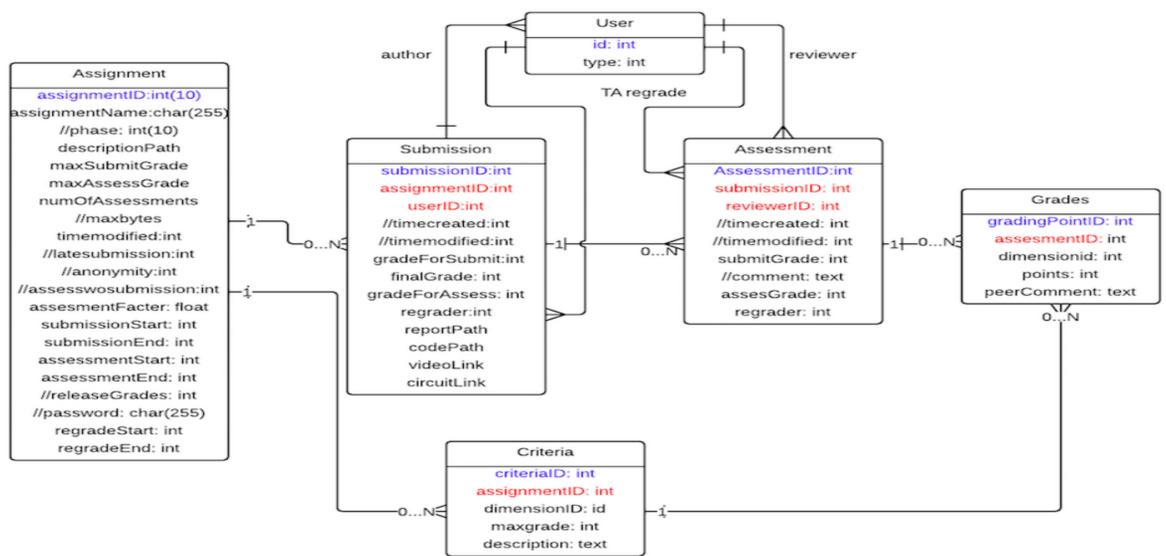


Flow of grading process

Web-based Peer Review, which allows students review other students' work over the web, instead of by TA in traditional grading method. Considering large amount of students, limited number of TAs and communication block caused by long-distance learning, Web-based Peer Review is a perfect choice for MOOC. It also encourages students to study more actively. Students give each other feedback on how to improve their work can lead to deeper understanding of their own work and even some inspirations.

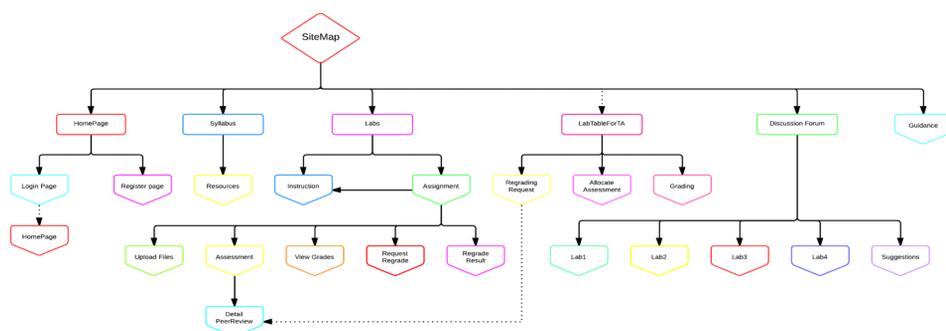
Our grading process is divided into three part. The first part is submission, in this phase students should submit their work before the submission deadline, which includes a report, source code, 123Circuit link and even a link to youtube video. After the submission deadline, our system chooses students who submitted their complete work and implement web-based peer review, each student will be assigned several assessments. After peer review, system will calculate the grades, The third phase is regrading, after students get their scores and comments, they can request for regrading if needed.

How we did it



Database structure

Assignment table keeps information about the assignment instances and their settings. **The Table Submission** shows the info about the submission and the aggregation of the grade for submission, grade for assessment and final grade. **Assessment table** shows the info about the made assessment and automatically calculated grade for it. It can be always overridden by TA if student do not receive their grades when grading ends. **GradingPoint table** shows how the reviewer filled-up the grading forms, given(sub)grades and comments. **Criteria table** is the evaluation elements definitions of Rubric grading strategy forms.



Website structure