

MentorHub: Crowd-Sourced Mentorship in MOOCs at Scale

Description

I am working on an HCI education technology research project. I will be working under the guidance of Professor Chinmay Kulkarni. He specializes in learning at scale and has done extensive previous work in technology to improve learning in Massive Online Open Courses (MOOCs). Additionally, I will be working more directly with Adam Stankiewicz, a PhD student who Professor Kulkarni advises.

Our goal for the research over this semester and next semester is to build a system, tentatively called MentorHub, which will act as a third party tool to provide students in MOOCs with mentors. One of the structural problems we are trying to tackle is how to increase retention of users in MOOCs. Our hypothesis is that mentorship, one of the huge differences between in-person courses and online courses, is a factor that will keep students more engaged in the MOOCs.

As subgoals, this semester we aim to get a version of the system mostly working and have it deployed in at least one real MOOC. Then, we will do analysis on the testing and feedback that is done and iterate on the system to improve it. Finally, in addition to making the system as effective as possible, we will use the system to answer research questions about how the system impacts the experience in MOOCs and if any of our original hypothesis about its effects were correct.

A big challenge in making this system is designing it so that we target the correct use case of students while also keeping into account more practical concerns like how to incentivize people to be mentors. We have already begun refining and iterating on our ideas by creating quick and lightweight prototypes that we are testing with small groups of users. This testing has led to effective feedback that allows us to try and refine the system as much as possible.

In terms of my role, I am going to be a chief engineer in terms of actually building the application. It is going to be built on a Django web backend and will also have real-time functionality for things like chat through a service called firebaseJS. In addition to development, I am also a key driver in a lot of the design decisions being made on how to design the system. My extensive experience as a TA for 15-112 has given me a unique perspective that has proven useful in identifying places to look into. Finally, I will also be part of the cycle for rolling out the system to MOOCs, testing it, and analyzing the results to come up with how to move forward.

In terms of importance, we are targeting the 85% of people that sign up for MOOCs and don't actually take them. If we are able to increase retention and learning in a small way, that would impact hundreds of thousands of students and potentially have a very large positive impact. Our goal is to have the system deployed and used in MOOCs. This would lead to millions of people using the system and getting good, quality help from it.

Goals

In my work this coming semester I hope to build out the MentorHub system and utilize some new technologies that I have not used before. These include the firebaseJS real-time software as well as a reactJS frontend framework for the frontend web development. If all goes well, then we will successfully deploy this system into real MOOCs such as Coursera or Audacity and have tens of thousands of students using and benefiting from it.

100% Goal: The system works, is iterated on with extensive user testing, and is deployed to one or two MOOCs that are successfully using it.

75% Goal: The system is built but it is not effectively tested and deployed into a real online course. This would be un-ideal because we would want to test it on a representative set of users and the only true way to simulate this would be with a real MOOC.

125% Goal: MentorHub is fully deployed and function. It is being used by a large number of popular MOOCs and is being used by a significant number of students.

Milestones

15-300 Milestone

By the last day of the semester my aim is to have a deployed system that takes into account one or two rounds of prototyping and iterating. A stretch goal would be to have the system being deployed to a MOOC or at least in the works to be deployed.

January 25th

Have system being used by a MOOC and maintain/service it from a technical standpoint in whatever way is necessary.

February 8th

Begin to collect and analyze data from the deployed system as well as iterate on whatever initial feedback or observations we have made from the students using the course.

February 22nd

Formulate/finalize research questions to ask in order to guide the data collection as well as questions asked in surveys/interviews with users of the system.

March 14th

Finalize data collection from the system and also conduct surveys/interviews on the users in order to get some quantitative and qualitative data on its effectiveness.

March 28th

Finalize analysis of results as well as continue to iterate on the system. Begin to work on the poster and results for the Meeting of the Minds project report.

April 11th

Evaluate the results of the analysis and use it to guide our path forward with the MentorHub system. Will have to evaluate if we answered our original question on how to increase retention in MOOCs as well as see if the learning itself was benefited.

April 25th

Finish the research poster, any presentations on the research, and any papers on the research by this date.

Literature Search

These are the main sources that I have read for background reading. There are other papers that we have been referencing from and learning from but these are the main ones:

Matti Nelimarkka and Arto Vihavainen. 2015. Alumni & Tenured Participants in MOOCs: Analysis of Two Years of MOOC Discussion Channel Activity. In *Proceedings of the Second (2015) ACM Conference on Learning @ Scale (L@S '15)*. ACM, New York, NY, USA, 85-93. DOI=<http://dx.doi.org/10.1145/2724660.2724671>

Fabian Fagerholm, Alejandro S. Guinea, Jürgen Münch, and Jay Borenstein. 2014. The role of mentoring and project characteristics for onboarding in open source software projects. In *Proceedings of the 8th ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM '14)*. ACM, New York, NY, USA, , Article 55 , 10 pages. DOI=<http://dx.doi.org/10.1145/2652524.2652540>

Derrick Coetzee, Armando Fox, Marti A. Hearst, and Björn Hartmann. 2014. Should your MOOC forum use a reputation system?. In *Proceedings of the 17th ACM conference on Computer supported cooperative work & social computing (CSCW '14)*. ACM, New York, NY, USA, 1176-1187. DOI=<http://dx.doi.org/10.1145/2531602.2531657>

Rosta Farzan, Robert Kraut, Aditya Pal, and Joseph Konstan. 2012. Socializing volunteers in an online community: a field experiment. In *Proceedings of the ACM 2012 conference on Computer Supported Cooperative Work (CSCW '12)*. ACM, New York, NY, USA, 325-334. DOI=<http://dx.doi.org/10.1145/2145204.2145256>

Resources Needed

None, I have everything that I will need.