

Principles for Tools Supporting Engineering Design Challenges at Scale

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ABSTRACT

Peer-instruction, peer-reviewing, and more recently learner-sourcing can help students learn, especially when the student-to-staff ratio is high. We describe three deployed learner-sourcing scenarios within the context of an undergraduate digital design class. The key design principle is students should be directed to hints written by other students who have just completed the task themselves. Initial results are promising, and warrant follow-up work.

Author Keywords

engineering education; crowd-sourcing

ACM Classification Keywords

H.5.m. Information Interfaces and Presentation (e.g. HCI): Miscellaneous

INTRODUCTION

A TA will never had done it the length of time as the lecturer whose taught the course, who understands the relative frequencies and value of design decisions that students make while working on engineering challenges. Furthermore, while the TA is expected to solve the lab before coming in to help the students, they can only be expected to solve it one way, of all the potential ways students choose.

jsolution: crowd-sourcing with incentives and guiding constraints; The collective activity of large classes can map out Students can become the local experts on what they implemented, which is both valuable pedagogically and from the perspective of scaling classes up without always having the staff to support them.

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DEAR BETA: OPTIMIZATION EDITION

Description

Design Challenges

- shorter spaces between check-ins with sheet
- automated population of fields/calculation of change in benchmark (less lowfi)
- no enough incentive to participate
- lacks debugging tips as well (perhaps just as plentiful)

Students hear optimization stories from friends: I tried x and I got y points! Modify it to be: –it had this effect to my critical path (delta) –It had this effect on my size (delta)

FUTURE WORK

- deploy ‘real’ version of Dear Beta system for 6.004x, which does double-duty for optimization as well, since that involves bugs too
- do git diffs on optimization of betas this term to see what folks actually did this term?
- create separate interface in which students can see their own place in space and time, along with diffs, and the ability to comment what they did (via API), with pull-down suggestions from other folks ;– more of a personal help system that motivates them to annotate.

ACKNOWLEDGMENTS

We thank CHI, PDC and CSCW volunteers, and all publications support and staff, who wrote and provided helpful comments on previous versions of this document. Some of the references cited in this paper are included for illustrative purposes only. **Don’t forget to acknowledge funding sources as well**, so you don’t wind up having to correct it later.

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