Research Topic: Examining Learning Programmers' Attention Patterns

Research Experience for Master's Students

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Rationale: The overarching goal of this project is to explore ways to improve programming education, which is increasingly important in the digital age. Specifically, this project aims to better understand how students who are learning programming focus their attention when trying to understand unfamiliar concepts and to explore ways to improve their ability to learn programming concepts.

This project will do this by conducting several eye tracking studies to understand where novice programmers choose to focus their attention when looking at various program structures. It will also explore ways to build user interfaces that can "nudge" learning programmers to begin to look at. We will then evaluate whether these interface changes are effective in directing students' focus and whether directing students' focus benefits their understanding of unfamiliar concepts.

Academic Objectives: To understand how different presentation formats affect learning programmers’ attention patterns for unfamiliar concepts and to explore ways to design presentation formats that can guide their attention in beneficial ways.

Student Role

The student will act as a research assistant for this project. The student will conduct eye tracking laboratory with participants and analyze the results of these studies. Beyond conducting these studies, any further roles will depend on their skill set and interests. Students who are interested in designing or developing user interfaces may implement or design some of the interface changes that aim to guide learners' focus. Students
who are interested in familiarizing themselves with related literature may take a role in writing any resulting publications from this research.

*Contribution to Student Academic and Professional Development:* The student will gain experience running laboratory studies, working with participants, and analyzing the resulting data.

**Mentoring Plan**

I will meet with the student on a weekly basis thought the duration of this project. I will work with the student to build a background on previous literature and on how to conduct laboratory studies. I also hope to give the student the opportunity to work with other MS and PhD students when appropriate.