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A Web-based Platform for Online Programming Education

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Title:

Abstract:

In this talk, I present Elice, an online CS (computer science) education platform, and two sub-systems Elivate and Eliph. Elivate is a system for taking student learning data from Elice and inferring their progress through an educational taxonomy tailored for programming education. Elice captures detailed student learning activities, such as the intermediate revisions of code as students make progress toward completing their programming exercises. With those data, Elivate recognizes each student's progression through an education taxonomy which organizes intermediate stages of learning such that the taxonomy can be used to evaluate student progress as well as to design and improve course materials and structure. With more than 240,000 intermediate source codes generated by 1,000 students, we demonstrate the practicality of the Elice and Elivate. With Eliph, we investigate the effectiveness of visualization of code history on peer assessment of code. Peer assessment is found to be an effective learning tool for programming education. While many systems are proposed to support peer assessment in programming education, little effort has been devoted to finding ways to improve the peer assessment by assisting the students to understand the programs they are assessing. Eliph is a web-based peer assessment system for programming education with code history visualization. Eliph incorporates the visualization of character-level code history, selection-based history tracking and the integration of execution events to assist students in understanding programs written by peers, thereby leading to more effective peer assessment. We evaluate Eliph with an experiment in an undergraduate CS course. We show that visualization of code history has positive effects on promoting higher quality of peer feedback by understanding the intention and thought process.

Keywords: web-based platform, computer science education, peer evaluation

