Portable Multi-Course Lab for Enhancing Research Ability of Undergraduate Students

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1. Executive Summary (10 points)

Two weaknesses of a conventional teaching model include (1) a traditional single-course teaching model focuses on one-domain knowledge that limits undergraduate students’ research collaboration among multidisciplinary sciences and different techniques, and (2) a conventional theory oriented teaching model cannot effectively improve undergraduate students’ research ability due to no real hands-on research work.

We plan to establish a web-based portable multi-course lab across three undergraduate and graduate courses (CSc 4320/6320 Operating Systems, CSc 8320 Advanced Operating Systems and CSc 4810/6810 Artificial Intelligence). The portable multi-course lab provides students with any time any where multidisciplinary research opportunities. For instance, a student in Artificial Intelligence and another student in Operating Systems can use a cheap and portable device to do a joint hands-on project at a dorm room. In addition, an undergraduate student and a graduate student can work on an off-campus hands-on project together. Assessment of research outcomes will be done based on various evaluation metrics. For broad dissemination, we will show all teaching materials and students’ research projects on the web-based portable multi-course lab for students and faculty at GSU and other institutions in Georgia. Undergraduate students and advisors will submit excellent research papers to conferences and journals.