The ELVIS iLab: a Flexible Platform for Online Laboratory Experiments in Electrical Engineering

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This project is part of the collaboration between MIT and universities in sub-Saharan Africa to exploit the value of iLabs in the developing world [1]. The main goal of this project is to develop software that will integrate the National Instruments Educational Laboratory Virtual Instrumentation Suite (ELVIS) into the iLabs shared architecture. The project takes into consideration the special circumstances surrounding the deployment of iLabs in Africa such as bandwidth limitations, limited access to networked computers, and lack of computer skills on the part of students. Integrating ELVIS into iLabs will facilitate the rapid deployment of new online labs to augment the physics and electrical engineering curricula in these universities.

The iLab development efforts for this project are being made in parallel with developers at the Obafemi Awolowo University (OAU) in Nigeria. One of the main goals of the new system is to fill the gap of laboratory experiences in introductory level electronics and physics classes, which are hardest hit by the lack of equipment due to their typically large enrollment. Our goal is to support the development of electronic circuit building skills by providing an environment where students can easily try different circuit configurations before submitting experiments for execution. We are therefore investigating new iLab client-user interface designs that will enable students to create and edit circuit schematics from provided electronic components.

Our ELVIS iLab design will also formalize and simplify the process of creating and administering such labs for instructors, thereby speeding up the deployment of new labs in an environment where software development skills are not at a premium. This will be achieved by recycling many of the components that currently lie behind the success of the microelectronics weblab [2]; these components have been adapted before for new iLabs [3]. Besides reusing existing software, the project aims to make a major contribution towards enhancing students’ experiences with iLabs through its new interactive client design.

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Figure 1: This diagram shows how many of the microelectronics weblab components can be adapted to create software for developing new iLabs that communicate with the ELVIS board.

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REFERENCES