A new version of the MIT Microelectronics WebLab, an online semiconductor characterization laboratory, has recently been deployed. While WebLab is primarily of interest in microelectronics education, it also represents a testbed for new pedagogical and technological concepts associated with online laboratories.

WebLab 6.0, our latest release, is constructed around the newly developed iLab Shared Architecture – a three-tier framework designed at MIT to expedite the development and simplify the management of online laboratories [1]. The iLab Shared Architecture introduces a piece of middleware (termed the “Service Broker”) between the Client application and the Lab Server. This Service Broker uses Web Services to provide functionality, such as user authentication and data storage, that is generic and common to all labs as well as to facilitate lab-specific communication between a given Client – Lab Server pair. WebLab 6.0 is the first lab deployed using this architecture [2].

The WebLab 6.0 Client is implemented using Java technology. It features a more polished User Interface and has been designed to be more modular and extensible than previous versions. The WebLab 6.0 Lab Server was completely redesigned as a highly modular, data-driven web application that is an improvement both in terms of performance and reliability. Additionally, the basic design of the Lab Server, as well as certain implemented components, can be reused to develop new online labs.

WebLab 6.0 was deployed and successfully tested during the Spring 2004 semester in an undergraduate microelectronics course at MIT involving over 100 students. Since then, several undergraduate and graduate courses, both at MIT and other institutions, have made use of WebLab 6.0 for lab assignments. Additionally, the WebLab 6.0 source has been released as an exemplar as it is the first online laboratory implemented using the iLab Shared Architecture [3]. WebLab 6.0 can be accessed at http://openilabs.mit.edu.

**REFERENCES:**

