Leveraging FPGA Technology for Digital Logic and Embedded Systems Education

Dr. Stephen Brown
University of Toronto and Altera Toronto Technology Center

Abstract

Advances in technology create both opportunities and challenges in the evolution of the teaching curriculums for Electrical and Computer Engineering programs. This talk will focus on the topics of digital logic, microprocessors, and embedded systems. FPGA technology and the related CAD tools provide new opportunities to evolve these courses so that students obtain more hands-on experience, and learn about the design flows that are actually used for developing commercial products. However, while leveraging this technology it is also crucial to ensure that the curriculums retain solid coverage of the fundamental concepts. Without these concepts, students will be unlikely to develop an intuitive understanding of the nature of logic circuits or processors. Such students will lack the ability to develop robust, efficient circuits, or to make efficient use of processors and related peripherals. Furthermore, these students will lack the ability to debug any non-obvious problems that may occur in a design flow. We will examine these pedagogical issues and discuss whether it is possible to juxtapose the new technology with classical concepts to achieve the best of both worlds.