CSE 243A (Section Id: 743533)
VLSI Computer-Aided Design

Synthesis Methodologies in VLSI Design

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The increasing size of hardware designs has necessitated the use of ever increasing levels of Computer-Aided Design tools, synthesizing designs from ever higher levels of specification abstraction. While *logic synthesis* tools have already been established as an integral part of the design flow, *architectural synthesis* methodologies are making increasing inroads in the semiconductor industry. This course will provide an introduction to the main synthesis methodologies in hardware design, namely, *logic synthesis*, and *architectural synthesis*. Additionally, the size and complexity of systems-on-a-chip has placed *embedded systems* and *hardware-software codesign methodologies* centerstage in Computer-Aided Design. The course will furthermore provide an introduction to embedded systems research and will cover a selection of prominent recent research papers in the embedded systems area.

The following is the main course textbook:

- *Synthesis and Optimization of Digital Circuits*, by G. De Micheli, McGraw-Hill, 1994.

The following three books are recommended:

- *Readings in Hardware/Software Co-Design*, edited by G. DeMicheli, R. Ernst, and W. Wolf, Morgan Kaufmann, 2002.
- *Specification and Design of Embedded Systems*, by D.D. Gajski, F. Vahid, S. Narayan, and J. Gong, Prentice-Hall, 1994.
- *High-Level Synthesis: Introduction to Chip and System Design*, by D.D. Gajski, N. Dutt, A. Wu, and S. Lin, Kluwer Academic Publishers, 1992.

The course meets twice a week on Mondays and Wednesdays, 2:00 to 3:20 PM in EBU3B 2154.