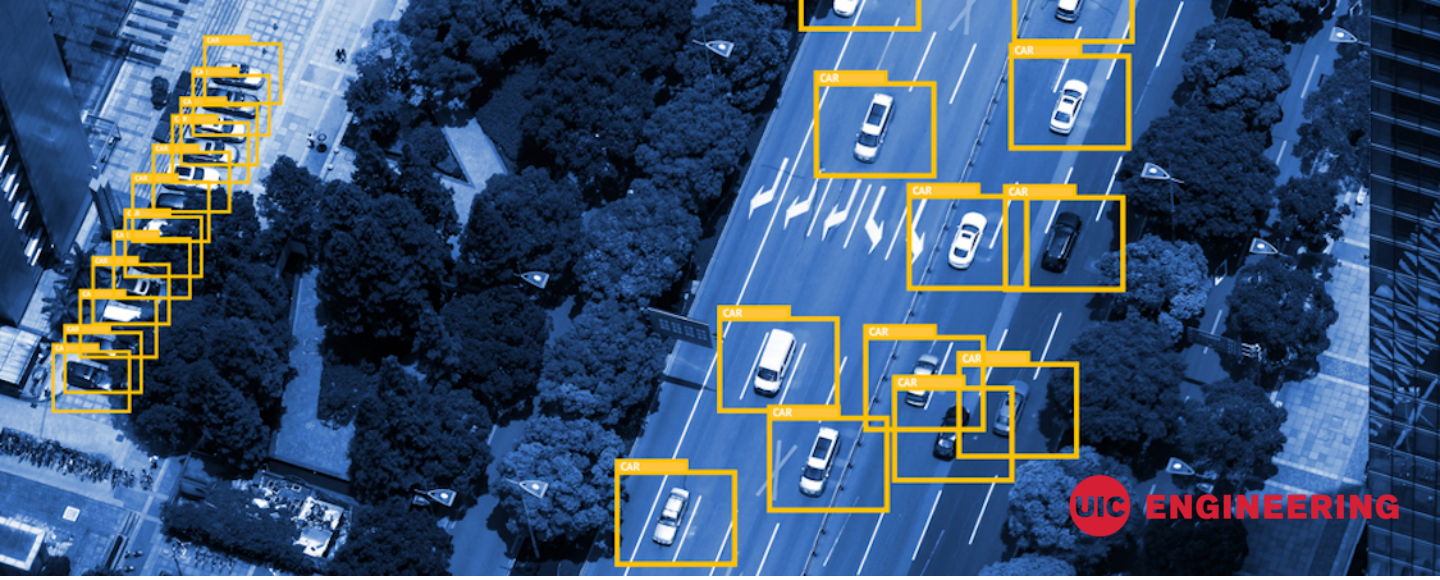

Embedded System Architectures for Intelligent Machine Applications

Machine learning is a crucial concept as our society develops computational platforms that can adapt and learn on their own.

In **four online courses**, UIC Engineering can give you a foundation in machine learning.

In this program, you will:

- Learn about specialized hardware for applications in machine learning, intelligent systems, and automotive
- Understand hardware systems and components for FPGAs and ASIC
- Use an integrated platform encompassing hardware-software tools and environments for embedded system design and FPGA programming
- Discuss testability issues and Design-for-Test (DfT) techniques for post-manufacturing testing of independent parts or parts in a complete system
- Explore an integrated modeling environment for design, verification, and evaluation of systems composed of analog, software and digital parts
- Determine how sensors that are the “eyes and ears” of intelligent systems interface with hardware and software processors

Course descriptions

UIC ENGINEERING

ECE 465 Digital System Design

Digital system design principles and VHDL hardware description language (HDL)

- Design flow
- VHDL for hardware description and simulation
- RTL design methodology
- Writing VHDL for automatic synthesis
- Design of basic cores and interfaces
- Testbench development

ECE 594 Advanced Digital System Design

Design and test hardware DSP cores, accelerators for machine learning applications, processing elements, and various interfaces

- Arithmetic and DSP cores
- Accelerators and cores for machine learning applications
- Processors and specialized processing cores
- Memory structures and utilization
- Handshaking and device interfacing
- Test methods, and making cores testable

ECE 594 Embedded Processors and Architectures

Putting together various cores, accelerators, and processing elements in an embedded environment using embedded busses and switch fabrics

- Intel embedded processor, Nios
- Memory interfacing, interrupts, DMA
- Buses and switch fabrics, Intel Avalon bus
- Accelerator design and embedded system interfacing
- Intel FPGA hardware and software design platform
- Embedded system for smart applications

ECE 594 Methodologies for System-Level Design and Modeling

Modeling hardware systems in a mixed, multi-level integrated environment using the IEEE-standard SystemC language and derivatives

- Using C++ programming language in hardware design
- SystemC, a C++ library for hardware description
- Containing complex communications in functions
- Sensors and analog parts in smart systems
- Integration of analog, hardware and software modeling
- High-level modeling of a machine learning application