Course Instructor

Prof. Volkan Kursun

A brief course description

Embedded systems are ubiquitous, and they are widely used in many products, such as consumer electronics, medical equipment, automobiles, aircrafts, and communication systems. Embedded systems have greatly enriched our life and extent our abilities. For example, the fuel efficiency of today's cars would be far lower if they did not use embedded systems. It is predicted that there will be 40 billion embedded systems in the world by 2020.

In this course, we will learn a few important concepts and design practices of embedded systems. We will see how a complex embedded system can be systematically developed as a union of software and hardware. The course will cover several fundamental topics, such as design targets, hardware/software co-design methodology, common design techniques, processors, architectures, and physical implementations. It will also cover several advanced topics, such as behavioral modeling, low-power techniques, and systems-on-chip.

A weekly schedule (major topics covered)

Date	Lecture
23 Feb	Introduction to embedded systems
8 March	SoC and ES development platform
22 March	HW/SW codesign methodologies
19 April	Embedded general-purpose and application-specific instruction-set processors
13 May	Single-purpose processor

Textbook & reference list

Major reference books

1. Frank Vahid and Tony Givargis, Embedded System Design: A Unified Hardware/ Software Introduction, John Wiley & Sons, 2002
2. Wayne Wolf, Computers as Components, Principles of Embedded Computing System Design, Elsevier, 4thedition, 2016

Grading policy

Homework: 35%
Lab: 30%
Final Exam: 35%