



Tempus

Development of Embedded System Courses with implementation of Innovative Virtual approaches for integration of Research, Education and Production in UA, GE, AM

Embedded System Courses in GTU

Faculty of Informatics and Control systems



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DesIRE

Georgian Technical University
Faculty of Informatics and Control Systems

Program:
“Control Systems, Automation and Test
Engineering”

Department of Control
Systems (#71)



Teaching Units Implemented at GTU

a) Fundamentals of Digital Systems (5 ECTS points)

This is a basic lecture on logic design with a particular focus on theoretical foundations of logic design, discrete mathematics, modern components of digital systems, and digital design principles.

b) Digital Systems Laboratory (5 ECTS points)

Modern design methodology based on hardware description languages and computer-aided design environments are covered in this lab.

c) Architecture of Digital Systems (5 ECTS points)

This lecture provides the basic knowledge in embedded processor architectures with a focus on modern RISC and VLIW processors. It covers basic design concepts for data paths, computer arithmetic, processor control, static and dynamic pipelining and memory hierarchy.

d) Embedded Systems Hardware Lab (Digital Systems II) (5 ECTS points)

This lab deals with basic concepts of VHDL design of embedded computing hardware components, low-level software programming and the complete tool chain for embedded system development with focus of SoC implementation. It provides a basic understanding of assembler programming.



New Courses

The new program and curriculum are prepared by the control systems department (GTU, Faculty of Informatics and Control systems) and there are the following new courses and syllabi:

- ❖ **Digital signal processing** (new course) 60h (2 ECTS)
- ❖ **Remote Labs and Virtualization** (new course) (60h (2ECTS) + 45h (1,5 ECTS) practical exercises in the remote labs)
- ❖ **Digital system design** (modification of course) 30h
- ❖ **Microcontrollers** (modification of course) 30h
- ❖ **Sensors, Actuators and Interfacing** (modification of syllabus) 30h
- ❖ **ECAD electronic design, ALTIUM** (new course) 40 h

The new courses according to the new curricula will be started at 2016-2017 academic year!!!!



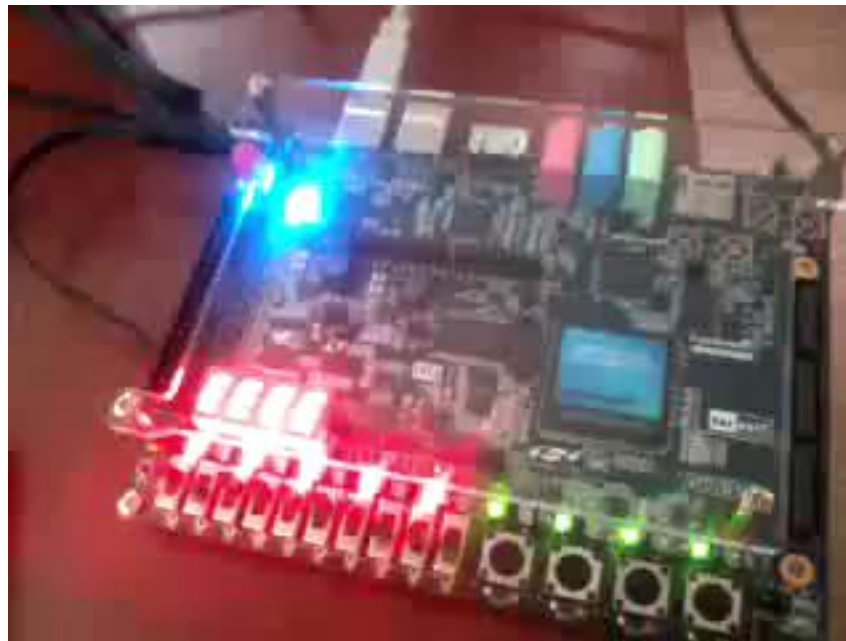
Embedded Systems Courses in our current program

Fundamentals of digital systems - C for Embedded Systems 15h
(for 3rd years students. We have replaced only 10 hours with C for Embedded Systems suggested by the project. We won't change the syllabus, we only replace the issues inside a lectures.)

Computer modeling of digital systems - Digital systems design 8h
(for 4th years students, who have selected the module "Technical facilities and technologies for automation".)

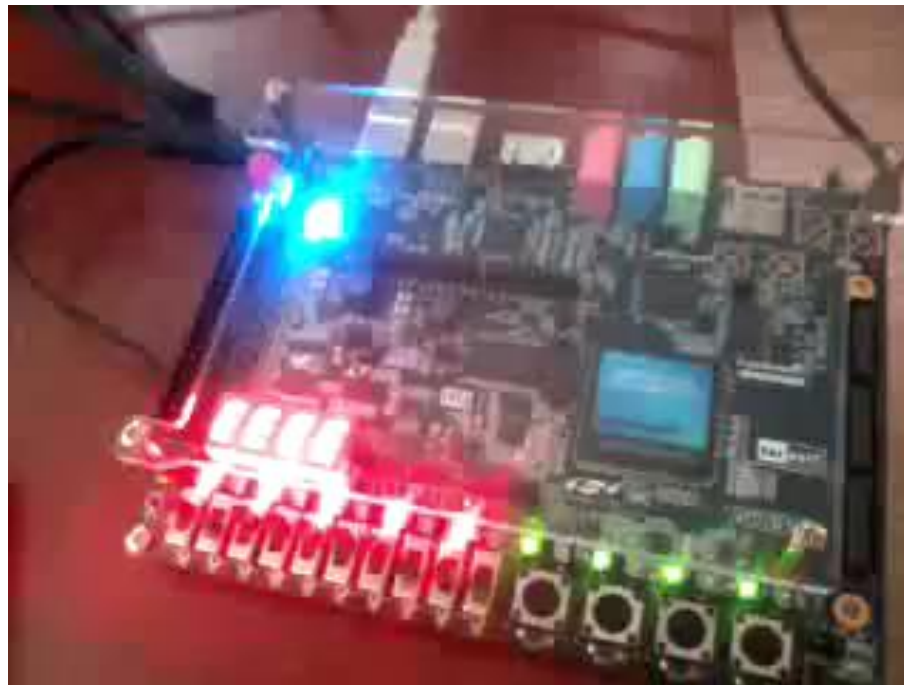


Master works (Altera board)



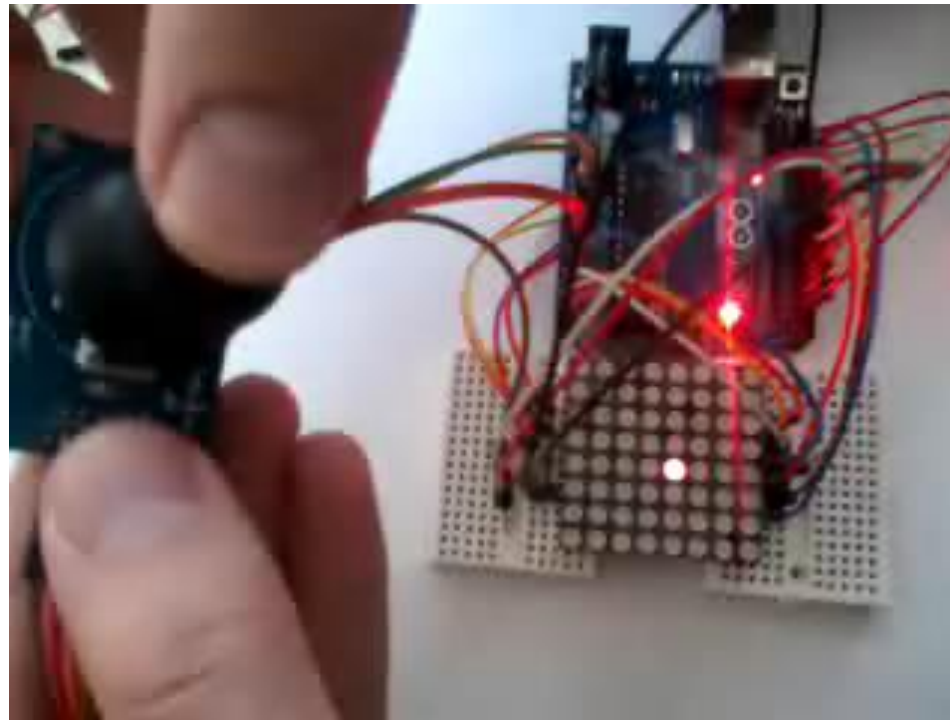


Master Works (Altera board)





Master Work (Arduino)



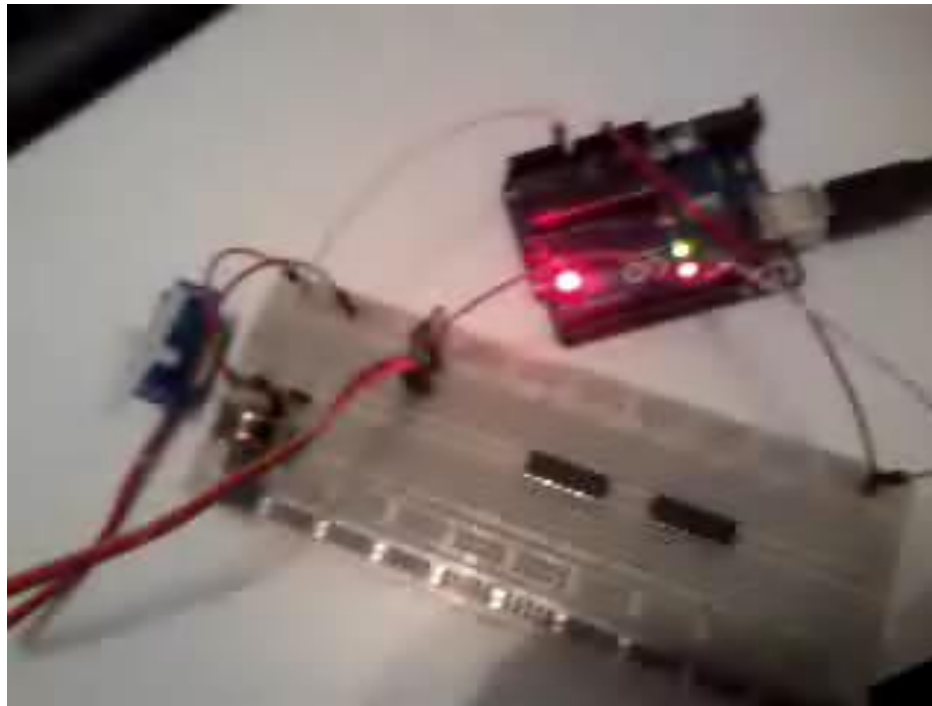


Master Work (Arduino)





Master Work (Arduino)





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Thank you for your attention!