Mechatronics

Finalità

The course is intended to provide an integrated introduction to the design of computer-controlled electromechanical systems. The central focus of this course will be the completion of a team-based project, to be tested in an in-class demonstration during the final week of the course.

Programma

Introduction to automatic machine control.
Boole's Algebra
Hard-wired control and programmable logic control.
Fourier and Laplace Transforms.
Transfer function.
Stability
PID regulation
Axis control.
Sensors and transducers,
Amplifiers.
Filters.
A/D and D/A converters.
PLC: languages
PLC: programming tools.
PC as control units
Software SCADA
Distributed automation: fieldbus (PROFIBUS, CANBUS, MODBUS)
Ethernet as fieldbus
Operating systems and automation: real time operating systems.
Industrial automation and security requisites.

Attività d'esercitazione

• Decoder 3-8 T4HCT 138.
• A simple driver for stepper motor.
• Converter D/A.
• Axis control for PC.
• Programming PLC.
• PC/PLC interface.
• Programming a simple SCADA.
• Using a real time operating system.

Modalità d'esame

The examination is made up by a project that simulates an industrial automation application and by an oral discussion about.
The active participation to lectures and other activities is evaluated.

Propedeuticità

None.

Testi consigliati

H. JACK: "Integration and Automation of Manufacturing Systems", available at http://claymore.engineer.gvsu.edu/~jackh/ under GPL license.