



Distance education and labs from IoT perspective



Map of Sweden.

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Introduction



- Blekinge Institute of Technology, Karlskrona, Sweden;
- Department of Applied Signal Processing
- Professor Chair in Multisensor Systems, MSS.



Recent courses:

- Research Methodology for Engineers – Master and PhD students in EE and ME;
- Sensors and Actuators.

IoT - cyber-physical system



Wikipedia

- "things" are "inextricable mixture of hardware, software, data and service".
- Aim is to "monitor and control" using sensors, actuators and network.
- Democratic access to "physical world".
- Need for standards



Distance Engineering Education - “Anytime Anywhere”



<http://dakotafire.net/schools/bridging-educational-gaps-with-distance>

- Opportunities
- Threats
- Need for standards

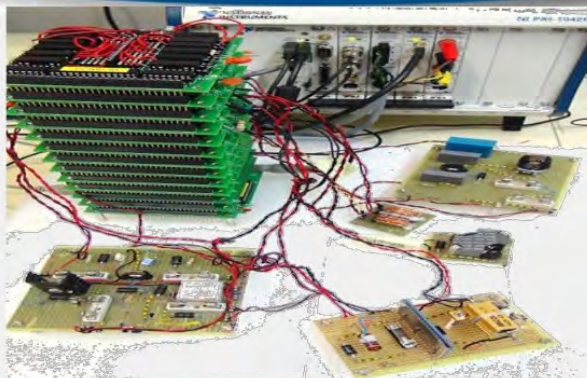




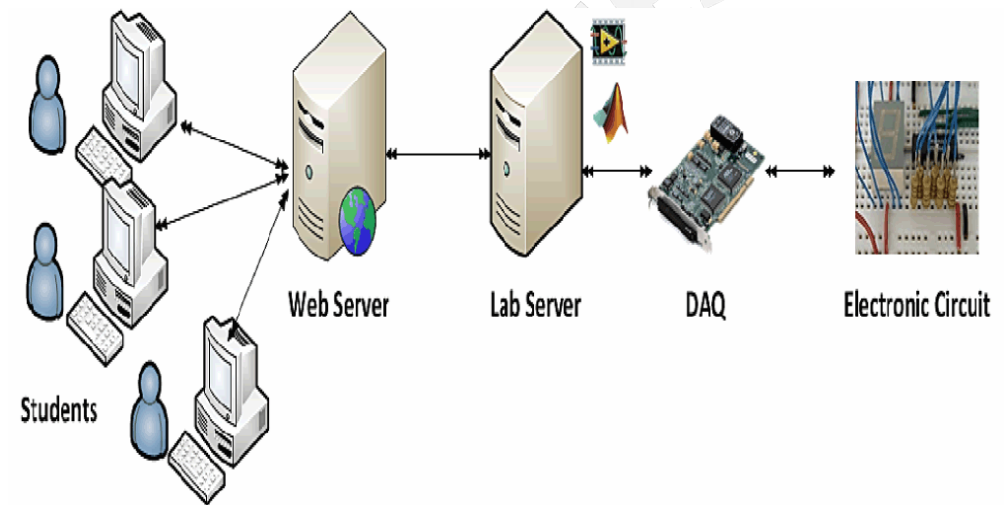
Today paradigm – Remote laboratory

- Remote lab is a centre oriented allows many to use the same facilities.
- It provides opportunity for networking and standardisation.
- The engineering students may experience virtual skills.

VISIR hardware at UNED



UNED Departamento de Ingeniería Eléctrica, Electrónica y de Control
Electrical and Computer Engineering Department
<http://www.ieec.uned.es>

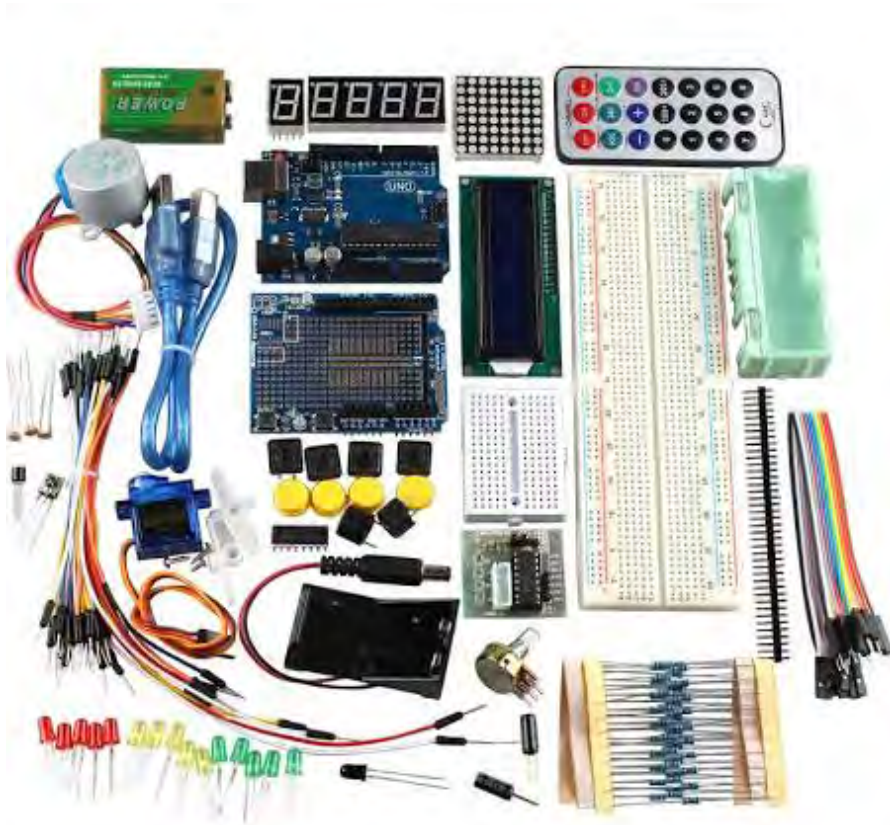


Future paradigm - Home labs

- Engineer loves experimenting;
- You learn by try and error;
- Microcontroller based home facilities



Future paradigm - Home lab



- Learning kit for Arduino – 23€
- Compatibility with all operation systems
- On-line accessibility to many examples and solutions

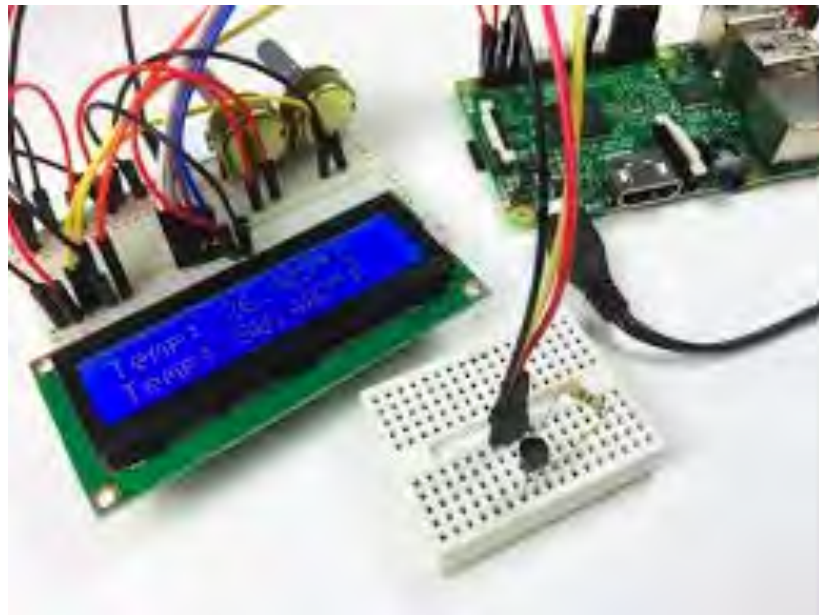
Case study course – Sensors and Actuators

- Education program in EE (Apply signal processing)
- 7.5 ECTS course:

Theory part 3 ECTS

Project part 4.5 ECTS

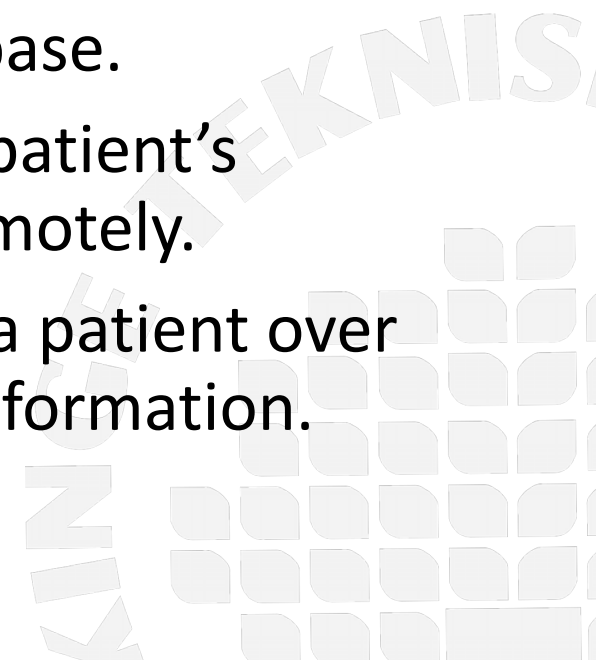
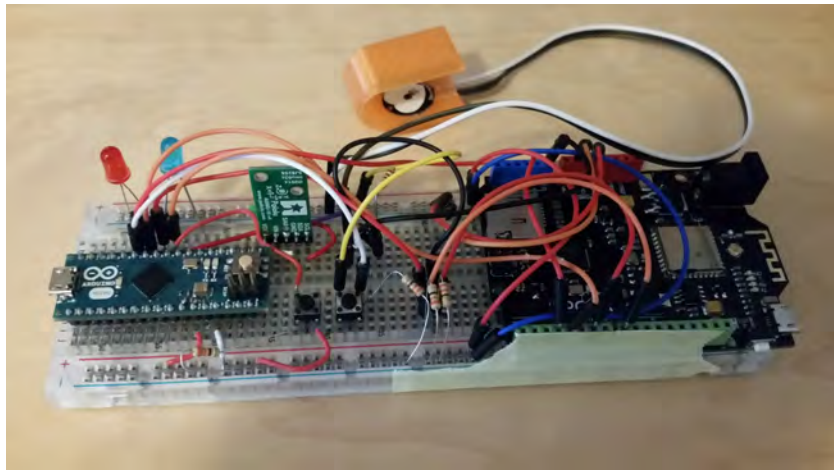
- Problem oriented education;
- Students borrowed the Arduino Uno and some other facilities from the university.
- Some students bought or had some equipment.
- There is an 'open lab' where the students are free and can practice on similar equipment: Raspberry Pi etc.



Case study course – Sensors and Actuators

Objectives of the project was:

- to use IoT devices to provide information to a database.
- to be able to follow a patient's measurement data remotely.
- to be able to monitor a patient over internet in real time information.





Distance Engineering Education



Due to the advance in technology:

- education system can be adjustable to student's level and interest;
- education method can be flexible in terms of schedule;
- it is possible to help electronics/mechatronics students to meet their interests at early curricula.

