STI Interdisciplinary Semester Project Competition

Lab-in-Tube

Robotics
What is it?

• Project based, multi-disciplinary learning
  – Learn crucial skills for your future career
  – See a clear, measurable outcome
  – Compare
• Teams of 3 people, all from different sections
• Implemented as optional semester project for all STI master programs
  – Limited seats!
• Two projects: Lab-in-Tube and Robotics
• Friendly competition
Working in a multidisciplinary team

• STI master students – semester project
  – Teams of 3 students from 3 sections (mandatory)
    • Lab-in-Tube: maximum 3 teams
    • Robotics: maximum 5 teams
  – Dedicated lab space to complete the challenge
STI Robot Competition
Auke Ijspeert and Alessandro Crespi

The environmental-friendly robot

AIM  Design and control robots that can detect, collect, and throw away waste (empty bottles or cans) in an arena (with diverse types of ground). The robot with the highest performance wins!

WHO?  Five teams of three students from 3 different STI master programs. The competition is done as a semester project (in a team rather than alone).

http://robot-competition.epfl.ch/
Example from last year

STI robot competition 2014

Video available on http://robot-competition.epfl.ch/
Example of an arena (8 × 8 m²)

- Stairs
- Ramp
- Rocks
- Grass
- Raised platform
- Obstacle (brick)

- Zone 1: 15 pieces of garbage, 10 points per piece
- Zone 2: 6 pieces of garbage, 20 points per piece
- Zone 3: 6 pieces of garbage, 40 points per piece
- Zone 4: 6 pieces of garbage, 40 points per piece

- recycling area (50%)
- recycling area (100%)

- red LEDs
- green LEDs
- yellow LEDs
- blue LEDs
Photo of an arena (8 × 8 m²)
Tools

- **WildThumper** robot chassis

- To be improved with **various sensors** and computing boards

- Access to **dedicated 3D printers**

- Access to workshops (staffed and hands-on)
- Use of a **budget** for the whole project
- Two dedicated rooms (ELE031/032), with testbed arena, PCs, and tools.

- Robots must be **fully autonomous**
Expertise from different masters

- **Microengineering**: mechatronics design, systems integration, control, programming
- **Electrical engineering**: PCB design, signal processing, control, programming
- **Mechanical engineering**: mechanical design and optimization, control
- **Material science**: mechanical design, innovative materials, innovative sensor systems
- **Bioengineering**: systems integration, programming

http://www.topstanwarstoys.com/interactive-r2d2-robot/
Why joining?

• Unique **hands-on experience** in complementary fields of engineering

• **Interdisciplinary** team work

• **Project management**, including budget management

• Credits (as for any semester project)

• Fun experience

• Fame! And a cool prize
Selection and timeline

• Apply as teams or individuals by **Nov. 30th**
• Outcome communicated by Dec. 8th
• Selection committee will form teams
• Officially, the project takes place during spring semester, but some tutorials will be given before
• Deadline for reports: June 5th, 2015
• Competition: mid-June 2015
More info

http://robot-competition.epfl.ch/

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