MICRO-553

Haptic human robot interfaces

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Cursus	Sem.	Type
Microengineering minor	E	Opt.
Microtechnics	MA2, MA4	Opt.
Neuro-X minor	E	Opt.
Neuro-X	MA2, MA4	Opt.
Robotics	MA2, MA4	Opt.

Language of teaching	English
Credits	4
Withdrawal	Unauthorized
Session	Summer
Semester	Spring
Exam	Oral
Workload	120h
Weeks	14
Hours	**4 weekly**
Courses	2 weekly
Project	2 weekly
Number of positions	**32**

It is not allowed to withdraw from this subject after the registration deadline.

Summary

This course teaches basic knowledge on haptic devices, force feedback and mechanical man-machine interfaces. Lectures are about 40 %, the rest is hands-on practical work with the "haptic paddle", a complete mechanical device with full laptop control interface. Realization of project in groups of 2.

Content

Keywords

Haptics - Haptic Interfaces - Human Robot Interfaces - Psychophysics - Impedance contol - Admittance control

Learning Prerequisites

Recommended courses

Basics of Robotics

Learning Outcomes

By the end of the course, the student must be able to:

- Design a haptic interface for robot, rehabilitation, prothesis, exoskeleton
- Realize a haptic interface for robot, rehabilitation, prothesis, exoskeleton
- Analyze a haptic interface for robot, rehabilitation, prothesis, exoskeleton
- Assess / Evaluate a haptic interface for robot, rehabilitation, prothesis, exoskeleton
- Propose a haptic interface for robot, rehabilitation, prothesis, exoskeleton
- Defend the proposed solution
- Explain the purpose and function of a haptic interface

Transversal skills

- Set objectives and design an action plan to reach those objectives.
- Communicate effectively, being understood, including across different languages and cultures.

- Communicate effectively with professionals from other disciplines.
- Access and evaluate appropriate sources of information.
- Write a scientific or technical report.
- Write a literature review which assesses the state of the art.
- Make an oral presentation.
- Summarize an article or a technical report.

Teaching methods

Lectures
Labs and Hands On, using a Haptic Paddle
Seminars
Lab specialization

Expected student activities

Attendance to lectures from EPFL and guest lecturers
Labs which count in the final grade
Lab specialization which counts in the final grade

Assessment methods

Oral examination

Resources

Moodle Link

- https://go.epfl.ch/MICRO-553