

MICRO-553

Haptic human robot interfaces

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Cursus	Sem.	Type
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 Session	Unauthorized Summer
Semester	Spring
Exam	Oral
Workload	120h
Weeks	14
Hours	4 weekly
Lecture	2 weekly
Project	2 weekly
Number of positions	32

Il n'est pas autorisé de se retirer de cette matière après le délai d'inscription.

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 control - 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, prosthesis, exoskeleton
- Realize a haptic interface for robot, rehabilitation, prosthesis, exoskeleton
- Analyze a haptic interface for robot, rehabilitation, prosthesis, exoskeleton
- Assess / Evaluate a haptic interface for robot, rehabilitation, prosthesis, exoskeleton
- Propose a haptic interface for robot, rehabilitation, prosthesis, 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

Supervision

Office hours Yes

Assistants Yes

Forum No

Resources

Virtual desktop infrastructure (VDI)

No

Moodle Link

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