CS-442 **Computer vision**

Fua Pascal

Cursus	Sem.	Type
Communication systems minor	E	Opt.
Computer science minor	E	Opt.
Computer science	MA2, MA4	Opt.
Cybersecurity	MA2, MA4	Opt.
Data Science	MA2, MA4	Opt.
Data science minor	E	Opt.
Digital Humanities	MA2, MA4	Opt.
Hors plans	H	Opt.
Robotics, Control and Intelligent Systems		Opt.
Robotics	MA2, MA4	Opt.
SC master EPFL	MA2, MA4	Opt.

Language of teaching	English
Credits	4
Session	Winter, Summer
Semester	Spring
Exam	Written
Workload	120h
Weeks	14
Hours	**3 weekly**
Courses	2 weekly
Exercises	1 weekly
Number of positions	

Summary

Computer Vision aims at modeling the world from digital images acquired using video or infrared cameras, and other imaging sensors. We will focus on images acquired using digital cameras. We will introduce basic processing techniques and discuss their field of applicability.

Content

Introduction

- History of Computer Vision
- Human vs Machine Vision
- Image formation

Extracting 2D Features

- Contours
- Texture
- Regions

3D Shape Recovery

- From one single image
- From multiple images

Learning Outcomes

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

- Choose relevant algorithms in specific situations
- Perform simple image-understanding tasks

Teaching methods

Ex cathedra lectures and programming exercises using matlab.

Assessment methods

With continuous control

Resources

Bibliography

• R. Szeliski, Computer Vision: Computer Vision: Algorithms and Applications, 2010.

• A. Zisserman and R. Hartley, Multiple View Geometry in Computer Vision, Cambridge University Press, 2003.

Ressources en bibliothèque

• Multiple View Geometry in Computer Vision / Zisserman

• Computer Vision: Algorithms and Applications / Szeliski