Deep Learning for Image Analysis
Course Introduction

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About the lecturers

Thomas Walter

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- Research: bioimage analysis and bioinformatics
- Main application fields: microscopy, pathology

Santiago Velasco-Forero

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- Research: image processing, pattern recognition, multivariate statistics, graph-based data/image analysis
- Main application fields: Remote Sensing, cosmetology, astronomy, hyperspectral imaging.

Etienne Decencière

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- Research: mathematical morphology and image analysis
- Main application fields: Ophthalmology, dermatology, cosmetology, astronomy

Objective and pre-requisites

Objective

Introduction to the theory and practice of deep learning for image analysis.

Pre-requisites

- Basic calculus and probabilities
- Programming: Python

Language

- Slides: English
- Oral: English or French, according to auditory

Contents

Pedagogic approach

- 8 afternoon sessions (3 hours):
  - 12 lessons (90 minutes)
  - 4 sessions (90 minutes) of practical work with Jupyter notebooks (python, keras) on Google Colab

Themes

- Elements of Neural Networks
- Optimization
- Visualization strategies
- Learning from few annotated samples
- Autoencoders and Generative Adversarial Networks
- Metric learning

Evaluation

Practical work and exam