Deep Learning for Image Analysis
Course Introduction

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About the lecturers

Thomas Walter

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- Researcher on bioimage informatics, director of CBIO
- Main application fields: High Content Screening, as a method to systematically study biological processes by analyzing cellular phenotypes

Santiago Velasco-Forero

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- Researcher on 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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- Researcher on image analysis, mathematical morphology, deep learning
- Main application fields: Ophthalmology, dermatology, cosmetology, astronomy

Teaching assistants

- Tarek Zenati (CMM)
- Mateus Sangalli (CMM)
- Martin Bauw (CMM)
- Valentin Penaud (CMM)
- Thomas Langrognet (CMM)
- Tristan Lazard (CBIO, CMM)

Course organization

- During course sessions:
  - Lectures
  - Practical work presentation and correction
- Homework:
  - Python, keras, numpy
  - Google colab
  - Homework due: following sunday
- Communication
  - General information available from:
    `http://cours.cmm.mines-paristech.fr`
  - E-mail
    - Practical work: teaching assistants
    - Course questions: lecturers
    - General organization, absence justification:
      Etienne.Decenciere@mines-paristech.fr
- Grading:
  - Practical work: 35%
  - Written exam: 65% (november 9, 15h30)

Main notations

i, j, n, p, q	Integer scalars
x, y, z	Real scalars
$\mathbf{x}, \mathbf{y}$	Real vectors
$\mathbf{X}, \mathbf{W}$	Matrices
f, g	Functions
$\boldsymbol{\theta}$	Set of parameters

Bibliography

- Ian Goodfellow and Yoshua Bengio and Aaron Courville, Deep learning, MIT Press.
  `https://www.deeplearningbook.org/`
- Trevor Hastie, Robert Tibshirani, Jerome Friedman, The elements of statistical learning, Springer.
  `https://web.stanford.edu/~hastie/ElemStatLearn/`
- François Chollet, Deep Learning with Python, second edition.
  `https://www.manning.com/books/deep-learning-with-python-second-edition`