Deep learning for image analysis

ECTS : 4

Volume horaire : 24

Description du contenu de l'enseignement :

Deep learning has achieved formidable results in the image analysis field in recent years, in many cases exceeding human performance. This success opens paths for new applications, entrepreneurship and research, while making the field very competitive.

This course aims at providing the students with the theoretical and practical basis for understanding and using deep learning for image analysis applications.

Program to be followed
The course will be composed of lectures and practical sessions. Moreover, experts from industry will present practical applications of deep learning.
Lectures will include:

- Artificial neural networks, back-propagation algorithm
- Convolutional neural networks
- Design and optimization of a neural architecture
- Analysis of neural network function
- Image classification and segmentation
- Auto-encoders and generative networks
- Transformers
- Current research trends and perspectives

During the practical sessions, the students will code in Python, using Keras or Pytorch. They will be confronted with the practical problems linked to deep learning: architecture design; optimization schemes and hyper-parameter selection; analysis of results.

Compétence à acquérir :

Deep learning for image analysis: theoretical foundations and applications

Mode de contrôle des connaissances :

Practical session and exam