

Télécommunications

Traitement du signal et de l'image - Partie 2

IDENTIFICATION

CODE : IST-4-SIP2
ECTS : 3.0

HORAIRES

Cours : 0.0 h
TD : 20.0 h
TP : 0.0 h
Projet : 0.0 h
Face à face
pédagogique : 20.0 h
Travail personnel : 20.0 h
Total : 40.0 h

ÉVALUATION

Grading is done according to the following :
- The image processing lab report.
- A presentation of work on the Kaggle challenge.

SUPPORTS PÉDAGOGIQUES

LANGUE D'ENSEIGNEMENT

Anglais

CONTACT

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OBJECTIFS RECHERCHÉS PAR CET ENSEIGNEMENT

This course comprises 2 modules :
- A theoretical and practical introduction to image processing.
- A deep learning workshop.

PROGRAMME

- Digital image representation (spatial and frequency domains), notions of neighborhood, sampling, quantization etc.
- Image processing : histogram operations, linear operations (denoising, edge detection etc.), non-linear operations and mathematical morphology.
- Image segmentation : histogram, contour and region based approaches.
- Image processing lab applied to previous points.
- Introduction to deep learning via convolutional neural networks tutorial lab.
- Application of deep learning to a Kaggle challenge.

BIBLIOGRAPHIE

- Rafael C. Gonzalez and Richard E. Woods, Digital Image Processing, 3rd edition, Pearson, 2007
- Ian Goodfellow, Yoshua Bengio and Aaron Courville, Deep Learning, MIT Press, 2016, <https://www.deeplearningbook.org/>

PRÉ-REQUIS

Good background in applied math and digital signal processing is necessary, e.g. the SIP1 module, in addition basic Python programming skills.