

EIIN952	Advanced Deep Learning	CM 12h	TD 16h	HNE 22h
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Cours proposé dans la mineure / Course offered in the minor :

AL	CyberSec	IA-ID	IHM	IoT-CPS	Ubinet	IF	M1 EIT DSC	M2 EIT DSC	M2 Fintech
		x						x	x

Responsable / In charge of : **Precioso Frédéric** (Frederic.PRECIOSO@univ-cotedazur.fr)

Résumé / Abstract :

In this course, different hot topics in deep learning will be presented and experimented.

- We will study the recommendation systems and the necessary elements needed to built one.
- Starting with the segmentation and object recognition in 3D point cloud problem, we will browse different networks able to deal with 3D data such as 3D-CNN (extension of the known CNN) or Graph Neural Networks (GNN).
- Recent advanced in many domain have been done using transformers. They were invented for text applications and have now emerged in various domains including images, 3D point clouds and multimodal applications.
- Interpretability is an important topic for those who want to know if they can trust a learned model.
- Federated learning aims at sharing learning without sharing the data. An example is the keyboard from Android (Gboard). We will study the different approaches.

For each of these topics, we plan to present the theoretical aspects and to enable a small application built during the course hours.

Prérequis / Prerequisite :

- Machine Learning and Deep Learning courses from bimestre 1 (Apprentissage profond pour l'image / apprentissage profond pour le texte) or equivalent. This course is not a course for beginner in ML or Deep Learning.

Objectifs / Objectives :

- Discover and pratice hot topics in Deep Learning

Contenu / Contents :

- Recommendation systems
- Point cloud deep networks
 - o 3D CNN, GNN ...
- Multimodal transformers
- Interpretability :
 - o LIME, Shapley ...
- Federated learning

Références / References :

- arxiv.org
- paperswithcode.com

Acquis / Knowledge :

- Be aware of recent topics in deep learning

Evaluation / Assessment :

- Both theoretical and practical