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DEEP LEARNING & ARTIFICIAL INTELLIGENCE : AN INTRODUCTION

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| Lecturers : 16.0 | TC : 0.0 | PW : 0.0 | Autonomy : 0.0 | Study : 12.0 | Project : 0.0 | Language : MI

Objectives

By making possible breakthroughs supposed to be impossible until recently in a growing number of domains, e.g., computer vision, natural language processing, autonomous driving or games, deep learning has revolutionized the artificial intelligence domain that has become one of the major pillars of our society. In this course, our goal is to introduce the basis of concepts and technics in deep learning

Keywords : Deep learning, artificial intelligence, supervised learning, reinforcement learning, PyTorch

Programme

- Introduction to machine learning and deep learning
- Classification/regression and gradient descent
- Computational graphs & backpropagation
- Training deep neural networks
- Convolutional Neural Networks (CNN)
- CNN Architectures
- Deep reinforcement learning (Actor, Critic, Actor-Critic)
- Embedded Deep Learning

Learning outcomes

- Understanding the principles of deep learning
- Mastering fundamental techniques for supervised learning and reinforcement learning
- Being able to deploy a deep learning approach with the PyTorch framework

Independent study

Objectifs : The principles of deep learning introduced in the course will be implemented during three practical sessions using the PyTorch framework and a GPU card for embedded applications

Méhodes : use of PyTorch

Core texts

Ian Goodfellow, Yoshua Bengio, Aaron Courville., *DEEP LEARNING*, MIT Press, 2016
Bert Moons, Daniel Bankman, Marian Verhelst *EMBEDDED DEEP LEARNING ALGORITHMS, ARCHITECTURES AND CIRCUITS FOR ALWAYS-ON NEURAL NETWORK PROCESSING*, Springer, 2019
Richard S. Sutton, Andrew G. Barto.*REINFORCEMENT LEARNING: AN INTRODUCTION (2ND EDITION)*, MIT Press, 2018

Assessment

50% written exam, 50% evaluation of the assignments