

CODE xxx

Machine learning and Deep learning for health data analysis

Credits: **3 ECTS**
 Semester: **1**
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Content of the Course Unit

*The purpose of the course unit is to familiarise yourself with machine learning (ML) and deep learning (DL) algorithms. We will cover the basic principles behind ML and DL algorithms and apply them to textbook datasets as well as to medical ones. The course takes a pragmatic, user-oriented, approach rather than a more theoretical one (aimed at ML&DL researchers). The course unit comprises a series of hands-on tutorials. **Knowledge of the Python programming language is a prerequisite for this course (for the hands-on part).***

Detailed program

- Introduction to machine learning (ML) and deep learning (DL)
- Overview of ML algorithms: supervised, unsupervised, and reinforcement learning
- DL: neural networks (NN) and deep neural networks (DNN)
- Example applications of ML&DL to the analysis of health data
- Ethical considerations of ML&DL

Competencies acquired for MIAI Label

Competencies	Novice	Intermediate	Advanced
1 - Select and use the right tools for structuring, exploring, researching, storing, and using data		X	
1.1 - By collecting and consolidating, explaining the data for decision-making assistance (business intelligence)		X	
1.2 - Knowing the sources and the data acquisition to train a model			X
1.3 - By assessing the ethical and regulatory impacts linked to the data and their use		X	
2 - Know and apply learning and symbolic AI technologies			X
2.1 - Knowing the main models and tools (their context and application conditions, their inputs and outputs)			X
2.2 - By modelling a customer or application problem and identifying the use of AI to solve it		X	
3 - Identify, explore and model AI technologies on real applications		X	
3.1 - By having the ability to interact with specialists in the field to identify the problem and specify the needs			X
3.2 - By understanding the AI architecture dedicated to an application and by making it evolve so that it matches business or customer needs: data (collection, storage, management); learning; decision making; analysis and model relevance.			X
3.3 - By knowing and mastering the management of an AI project in a company		X	

Organisation

The course unit contains about 8h of teaching, together with 4h of tutorials. To prepare the assignments, self-study is expected, as the goal of the course is to train you to be able to use the wealth of online and other resources in ML and DL.

Rules of validation

Assignments (100%)