DEEP LEARNING AND COMPUTER VISION WITH PYTORCH

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COURSE OBJECTIVES AND OUTCOMES

Objectives: to provide students with the fundamental elements of deep learning and demonstrate its application to computer vision.

The course will also give the necessary foundamentals to understand the concepts, so knowin machine learning is recommended, but not mandatory.

Outcome: An understanding of fundamental concepts and methods of deep learning and its applications, with particular focus on computer vision

COURSE OUTLINE

1. Introduction to Machine Learning and Deep Learning (2 hours)
2. Data Representation with Tensors (2 hours)
3. Learning from Tensors: Gradient Descent and Backpropagation (4 hours)
4. Using a Deep Neural Network to Learn from Data (2 hours)
5. Designing and Improving Models (3 hours)
6. Real-Time Object Detection with YOLO (3 hours)
7. Running Scientific Experiments with PyTorch (4 hours)

MATERIAL

Reference Books:

- Stevens, Eli, Luca Antiga, and Thomas Viehmann. Deep learning with PyTorch. Manning Publications, 2020.

Other useufl references: – Pattern Recognition and Machine Learning, C. Bishop, Springer, 2007 – Dive into Deep Learning, A. Zhang, Z. C. Lipton, M. Li, A. J. Smola, 2020: https://d2l.ai – Pattern Classification (2nd ed.), R. O. Duda, P. E. Hart, e D. G. Stork, John Wiley & Sons, 2000

- Website / Repository of the ML course https://github.com/unica-ml/ml

Teams Channel: – Please subscribe to the course Teams channel. The link can be found on the course website

ASSESSMENT

TBD