

ADVANCED TOPICS IN COMPUTER VISION

1. SYLLABUS INFORMATION

1.1. Course title

Advanced topics in computer vision

1.2. University

University of Bordeaux

1.3. Semester

3rd

2. COURSE DETAILS

2.1. Course nature

Compulsory

2.2. ECTS Credit allotment

3

3. COMPETENCES AND LEARNING OUTCOMES

3.1. Course objectives

With a focus on the image classification task, the goal of this course is to go beyond large-scale and balanced data sets by considering data and computational resource constraints.

In the case of data constraints, this course will cover few-shot and one-shot image classification, long-tailed distribution, continual learning, and incremental learning. In the case of computation resource constraints, this course will cover model compression and distillation, weight quantization, binary neural networks, the training of quantified networks, and hashing methods for representation learning.

3.2. Course contents

It will cover standard methods by answering the following questions:

- How to handle data scarcity?
 - Transfer learning and fine-tuning
 - Few-shot / one-shot
 - Imbalanced dataset
 - Continual and incremental learning
- How to deal with low computational resources?
 - Model compression
 - Model distillation
 - Weight quantization
 - Binary/Ternary deep networks

- Training quantified models
- Hashing methods for compressed representation learning