Computer Vision (CV)

Polytechnic University of Tirana 12-16 May, 2025

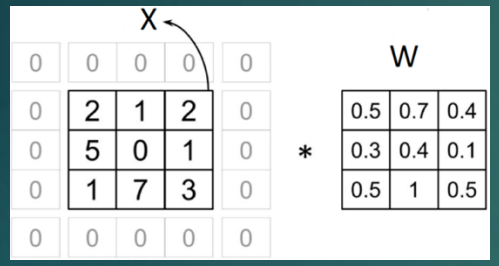
CHRISTIAN MATA, PHD
christian.mata@upc.edu

- **PART 1: Contents**
- PART 2: Schedule
- PART 3: Repository

Computer Vision (CV)

Part 1: Contents

IMAGE PREPROCESSING



- Basic handling (math operations, reshape, logical masks)
- Filtering methods (Spatial, morphological, frequency)

IMAGE SEGMENTATION

Pixelclustering(unsupervised)
Pixel classification (supervised)
Deep Learning
(Encoder-Decoder)

IMAGE CLASSIFICATION

- Extraction of regional features
- Region-based features (Traditional ML)
- Deep Learning (CNNs)

Computer Vision (CV)

Part 1: Contents

Module 1: Introduction to image processing (4 hours)

Basic image handling and preprocessing. Spatial (convolutional) filters, morphological operations, filters in the frequency domain.

Module 2: Image segmentation (4 hours)

Unsupervised segmentation using clustering algorithms. Supervised methods using pixelwise classifiers.

Module 3: Image classification (4 hours)

Extraction of regional features. Texture analysis and entropy. Region-based supervised classifiers. PCA Eigenfaces.

Module 4: Introduction to deep learning (4 hours)

Convolutional neural networks for image classification. Segmentation using Convolutional Neural Networks.

Computer Vision (CV)
Part 1: Schedule

- PART 1: Content
- **PART 2: Schedule**
- PART 3: Repository

Computer Vision (CV)

Part 2: Schedule

TIRANA

	Monday 12	Tuesday 13	Wednesday 14		
9-10h	Presentation Module 1		Module 3		
10-11h	Module 1		Module 3: Exercise 3		
11-12h	Module 1		Module 3		
12-13h	Module 1: Exercise 1		Module 3: Exercise 4		
13-14h					
14-15h		Module 2			
15-16h		Module 2			
16-17h		Module 2			
17-18h		Module 2: Exercise 2			

ONLINE

	Monday 19	Tuesday 20	Wednesday 21	Thursday 22	Friday 23
9-10h					
10-11h					
11-12h					
12-13h					
13-14h					
14-15h					
15-16h	Module 4	Module 4	Test		
16-17h	Module 4	Module 4	Test		
17-18h	Module 4	Module 4			

- PART 1: Content
- PART 2: Schedule
- **PART 3: Repository**

Course materials

https://github.com/xtianu/CV_Tirana

- **Pautes....**

CAP!

Iniciativa, organització, creativitat, originalitat.....

Aquest laboratori ens ha de servir per aprendre i informar-nos de les diferents tècniques de segmentació existents.... I ens ajudarà per fer el CHALLENGE FINAL