Professional Master's Degree

Computer Vision

Accreditation/Membership

The Society for the Study
of Artificial Intelligence
and Simulation of Behaviour

tech global university

tech global university

Professional Master's Degree
Computer Vision

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Accreditation: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: www.techtitute.com/us/information-technology/professional-master-degree/master-computer-vision

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Introduction to the Program

Computer Vision represents one of the most dynamic branches within the field of Computer Science, with applications in sectors such as robotics, healthcare, security, and automotive. This discipline combines machine learning techniques, digital image processing, and computational analysis to enable systems to autonomously interpret visual environments. According to the United Nations, the development of technologies based on computer vision is key to advancing intelligent automation and real-time decision-making. In this context, TECH offers a 100% online Professional Master's Degree in Computer Vision, with a technical approach adapted to the current challenges of the digital environment.

A comprehensive and 100% online program, exclusive to TECH, with an international perspective supported by our membership with The Society for the Study of Artificial Intelligence and Simulation of Behaviour"

Computer Vision has become a key tool for the development of advanced solutions in multiple areas of Computer Science. Its evolution has enabled digital systems to recognize, analyze, and interpret images with precision, optimizing processes in sectors such as industry, healthcare, agriculture, and surveillance. The growing need for intelligent automation and real-time visual analysis has driven the demand for professionals capable of designing and implementing solutions based on this technology. In this context, it is essential to have academic programs that address in-depth the theoretical foundations and practical applications of this field.

In response, TECH Global University launches an innovative Professional Master's Degree in Computer Vision that stands out for its technical, rigorous, and up-to-date approach. The academic itinerary will delve into human visual perception and the historical evolution of the discipline, all the way to the acquisition and processing of images through optical systems. Additionally, the physical and technical foundations of image capture, lighting, and processing will be analyzed, providing professionals with a solid foundation to understand its application in industrial, medical, space, and commercial sectors. In this way, graduates will acquire advanced competencies to design and implement automated, effective, and adaptable visual solutions in complex technological environments.

Furthermore, TECH offers a convenient 100% online academic environment that allows students to access all content from anywhere and at any time. This flexibility is particularly useful for active professionals or those who need to balance their studies with other activities. Additionally, the program employs its disruptive Relearning system to ensure a natural and progressive assimilation of concepts, without the need to invest long hours of study.

Thanks to TECH's membership with the **Society for the Study of Artificial Intelligence and Simulation of Behaviour (AISB)**, students will have access to digital publications such as AISB and Discussions, as well as a weekly newsletter with news and job offers. Additionally, they will enjoy discounted rates for AISB and ECAI conferences, receive travel support, and training to create local groups.

This **Professional Master's Degree in Computer Vision** contains the most complete and up-to-date university program on the market. Its most notable features are:

- The development of case studies presented by experts in Computer Vision
- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- Practical exercises where self-assessment can be used to improve learning
- Its special emphasis on innovative methodologies in Computer Vision
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an internet connection

You will create Computer Vision projects focused on innovation, efficiency, and process automation"

You will deepen your understanding of training algorithms for digital image processing and video analysis, using methods based on machine learning"

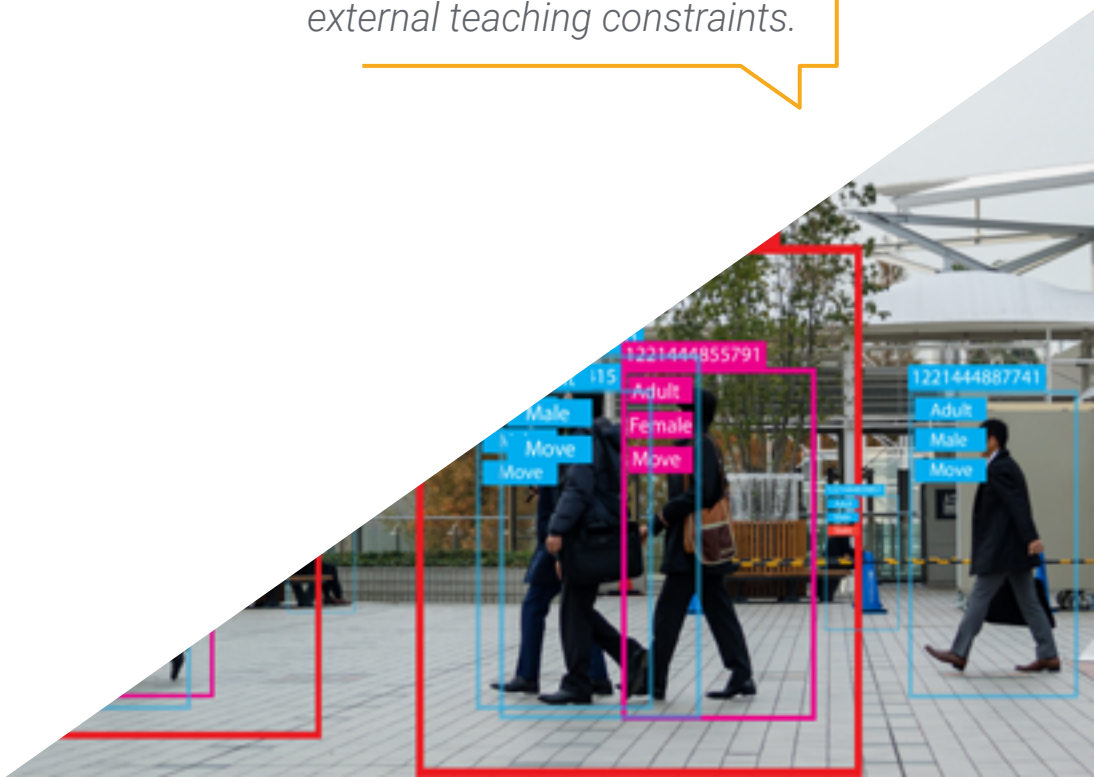
You will apply convolutional neural networks, generative models, and visual recognition systems to real-world institutional scenarios.

The distinctive Relearning system powered by TECH will allow you to learn at your own pace, without relying on external teaching constraints.

The faculty includes professionals from the Computer Vision field, who share the experience of their work in this program, as well as recognized experts from leading societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide an immersive learning experience designed to prepare for real-life situations.

This program is designed around Problem-Based Learning, whereby the student must try to solve the different professional practice situations that arise throughout the program. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced experts.



02

Why Study at TECH?

TECH is the world's largest online university. With an impressive catalog of more than 14,000 university programs, available in 11 languages, it is positioned as a leader in employability, with a 99% job placement rate. In addition, it has a huge faculty of more than 6,000 professors of the highest international prestige.

Study at the largest online university in the world and ensure your professional success. The future begins at TECH”

The world's best online university, according to FORBES

The prestigious Forbes magazine, specialized in business and finance, has highlighted TECH as "the best online university in the world" This is what they have recently stated in an article in their digital edition in which they echo the success story of this institution, "thanks to the academic offer it provides, the selection of its teaching staff, and an innovative learning method oriented to form the professionals of the future".

The best top international faculty

TECH's faculty is made up of more than 6,000 professors of the highest international prestige. Professors, researchers and top executives of multinational companies, including Isaiah Covington, performance coach of the Boston Celtics; Magda Romanska, principal investigator at Harvard MetaLAB; Ignacio Wistumba, chairman of the department of translational molecular pathology at MD Anderson Cancer Center; and D.W. Pine, creative director of TIME magazine, among others.

The world's largest online university

TECH is the world's largest online university. We are the largest educational institution, with the best and widest digital educational catalog, one hundred percent online and covering most areas of knowledge. We offer the largest selection of our own degrees and accredited online undergraduate and postgraduate degrees. In total, more than 14,000 university programs, in ten different languages, making us the largest educational institution in the world.

The most complete syllabuses on the university scene

TECH offers the most complete syllabuses on the university scene, with programs that cover fundamental concepts and, at the same time, the main scientific advances in their specific scientific areas. In addition, these programs are continuously updated to guarantee students the academic vanguard and the most demanded professional skills. and the most in-demand professional competencies. In this way, the university's qualifications provide its graduates with a significant advantage to propel their careers to success.

A unique learning method

TECH is the first university to use Relearning in all its programs. This is the best online learning methodology, accredited with international teaching quality certifications, provided by prestigious educational agencies. In addition, this innovative academic model is complemented by the "Case Method", thereby configuring a unique online teaching strategy. Innovative teaching resources are also implemented, including detailed videos, infographics and interactive summaries.

The official online university of the NBA

TECH is the official online university of the NBA. Thanks to our agreement with the biggest league in basketball, we offer our students exclusive university programs, as well as a wide variety of educational resources focused on the business of the league and other areas of the sports industry. Each program is made up of a uniquely designed syllabus and features exceptional guest hosts: professionals with a distinguished sports background who will offer their expertise on the most relevant topics.

Leaders in employability

TECH has become the leading university in employability. Ninety-nine percent of its students obtain jobs in the academic field they have studied within one year of completing any of the university's programs. A similar number achieve immediate career enhancement. All this thanks to a study methodology that bases its effectiveness on the acquisition of practical skills, which are absolutely necessary for professional development.

Google Premier Partner

The American technology giant has awarded TECH the Google Premier Partner badge. This award, which is only available to 3% of the world's companies, highlights the efficient, flexible and tailored experience that this university provides to students. The recognition not only accredits the maximum rigor, performance and investment in TECH's digital infrastructures, but also places this university as one of the world's leading technology companies.

The top-rated university by its students

Students have positioned TECH as the world's top-rated university on the main review websites, with a highest rating of 4.9 out of 5, obtained from more than 1,000 reviews. These results consolidate TECH as the benchmark university institution at an international level, reflecting the excellence and positive impact of its educational model.

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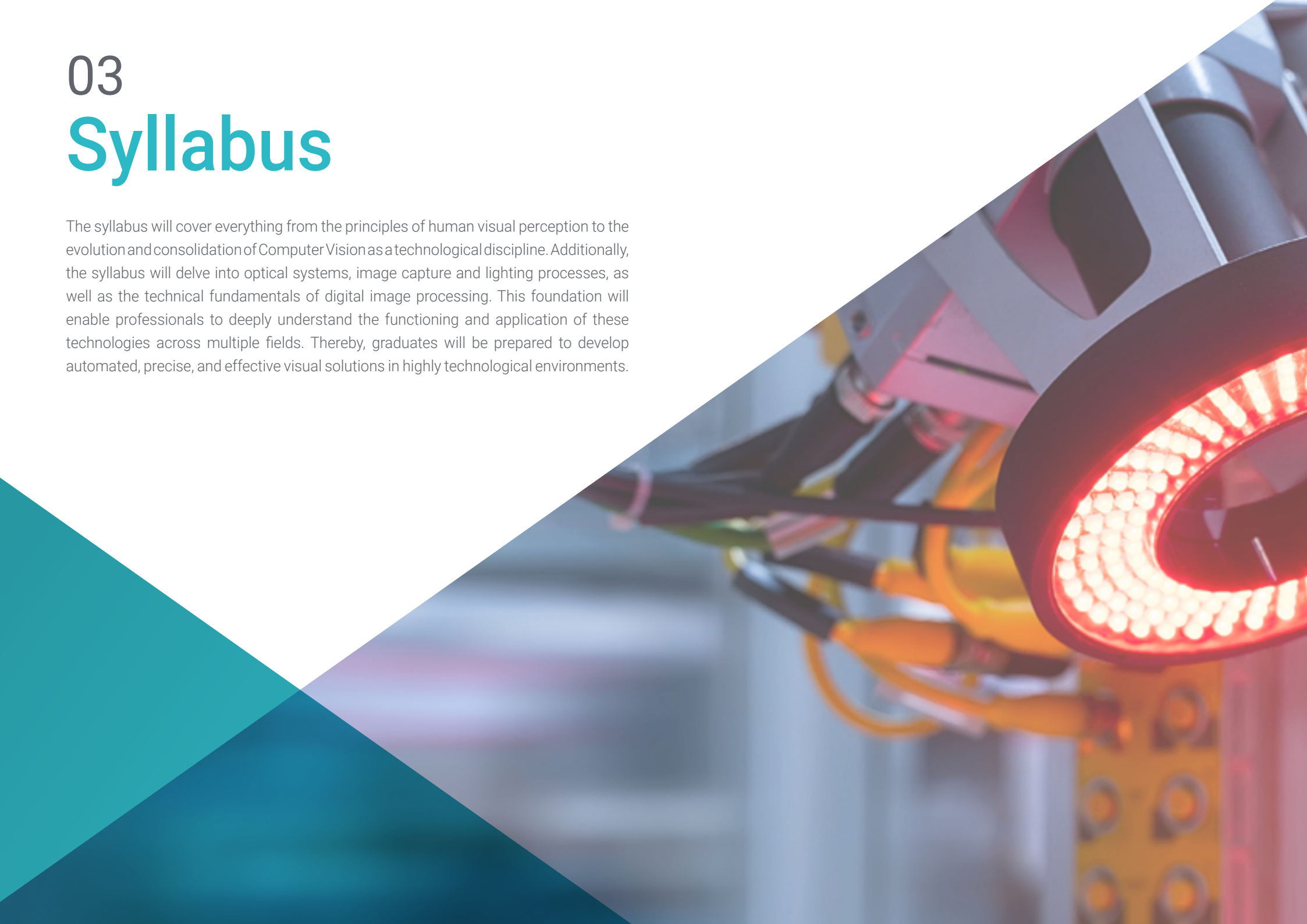
Syllabus

The syllabus will cover everything from the principles of human visual perception to the evolution and consolidation of Computer Vision as a technological discipline. Additionally, the syllabus will delve into optical systems, image capture and lighting processes, as well as the technical fundamentals of digital image processing. This foundation will enable professionals to deeply understand the functioning and application of these technologies across multiple fields. Thereby, graduates will be prepared to develop automated, precise, and effective visual solutions in highly technological environments.



You will master the use of specialized frameworks and programming environments such as TensorFlow"

Module 1. Computer Vision

1.1. Human Perception
- 1.1.1. Human Visual System
- 1.1.2. The Color
- 1.1.3. Visible and Non-Visible Frequencies

1.2. Chronicle of the Computer Vision
- 1.2.1. Principles
- 1.2.2. Evolution
- 1.2.3. The Importance of Computer Vision

1.3. Digital Image Composition
- 1.3.1. The Digital Image
- 1.3.2. Types of Images
- 1.3.3. Color Spaces
- 1.3.4. RGB
- 1.3.5. HSV and HSL
- 1.3.6. CMY-CMYK
- 1.3.7. YCbCr
- 1.3.8. Indexed Image

1.4. Image Acquisition Systems
- 1.4.1. Operation of a Digital Camera
- 1.4.2. The Correct Exposure for Each Situation
- 1.4.3. Depth of Field
- 1.4.4. Resolution
- 1.4.5. Image Formats
- 1.4.6. HDR Mode
- 1.4.7. High Resolution Cameras
- 1.4.8. High-Speed Cameras

1.5. Optical Systems
- 1.5.1. Optical Principles
- 1.5.2. Conventional Lenses
- 1.5.3. Telecentric Lenses
- 1.5.4. Types of Autofocus Lenses
- 1.5.5. Focal Length
- 1.5.6. Depth of Field
- 1.5.7. Optical Distortion
- 1.5.8. Calibration of an Image

1.6. Illumination Systems
- 1.6.1. Importance of Illumination
- 1.6.2. Frequency Response
- 1.6.3. LED Illumination
- 1.6.4. Outdoor Lighting
- 1.6.5. Types of Lighting for Industrial Applications. Effects

1.7. 3D Capture Systems
- 1.7.1. Stereo Vision
- 1.7.2. Triangulation
- 1.7.3. Structured Light
- 1.7.4. *Time of Flight*
- 1.7.5. Lidar

1.8. Multispectrum
- 1.8.1. Multispectral Cameras
- 1.8.2. Hyperspectral Cameras

1.9. Non-Visible Near Spectrum
- 1.9.1. IR Cameras
- 1.9.2. UV Cameras
- 1.9.3. Converting From Non-Visible to Visible by Illumination

1.10. Other Band Spectrums
- 1.10.1. X-Ray
- 1.10.2. Terahertz

Module 2. Applications and State-of-the-Art

2.1. Industrial Applications
- 2.1.1. Machine Vision Libraries
- 2.1.2. Compact Cameras
- 2.1.3. PC-Based Systems
- 2.1.4. Industrial Robotics
- 2.1.5. Pick and Place 2D
- 2.1.6. *Bin Picking*
- 2.1.7. Quality Control
- 2.1.8. Presence Absence of Components
- 2.1.9. Dimensional Control
- 2.1.10 Labeling Control
- 2.1.11 Traceability

2.2. Autonomous Vehicles
- 2.2.1. Driver Assistance
- 2.2.2. Autonomous Driving

2.3. Computer Vision for Content Analysis
- 2.3.1. Filtering by Content
- 2.3.2. Visual Content Moderation
- 2.3.3. Tracking Systems
- 2.3.4. Brand and Logo Identification
- 2.3.5. Video Labeling and Classification
- 2.3.6. Scene Change Detection
- 2.3.7. Text or Credits Extraction

2.4. Medical Application
- 2.4.1. Disease Detection and Localization
- 2.4.2. Cancer and X-Ray Analysis
- 2.4.3. Advances in Computer Vision given Covid19
- 2.4.4. Assistance in the Operating Room

2.5. Spatial Applications
- 2.5.1. Satellite Image Analysis
- 2.5.2. Computer Vision for the Study of Space
- 2.5.3. Mission to Mars

2.6. Commercial Applications
- 2.6.1. Stock Control
- 2.6.2. Video Surveillance, Home Security
- 2.6.3. Parking Cameras
- 2.6.4. Population Control Cameras
- 2.6.5. Speed Cameras

2.7. Vision Applied to Robotics
- 2.7.1. Drones
- 2.7.2. AGV
- 2.7.3. Vision in Collaborative Robots
- 2.7.4. The Eyes of the Robots

2.8. Augmented Reality
- 2.8.1. Operation
- 2.8.2. Devices
- 2.8.3. Applications in the Industry
- 2.8.4. Commercial Applications

2.9. *Cloud Computing*
- 2.9.1. Cloud Computing Platforms
- 2.9.2. From Cloud Computing to Production

2.10. Research and State-of-the-Art
- 2.10.1. Commercial Applications
- 2.10.2. What's Cooking
- 2.10.3. The Future of Computer Vision

Module 3. Digital Image Processing

3.1. Computer Vision Development Environment
- 3.1.1. Computer Vision Libraries
- 3.1.2. Programming Environment
- 3.1.3. Visualization Tools

3.2. Digital image Processing
- 3.2.1. Pixel Relationships
- 3.2.2. Image Operations
- 3.2.3. Geometric Transformations

3.3. Pixel Operations
- 3.3.1. Histogram
- 3.3.2. Histogram Transformations
- 3.3.3. Operations on Color Images

3.4. Logical and Arithmetic Operations
- 3.4.1. Addition and Subtraction
- 3.4.2. Product and Division
- 3.4.3. And/Nand
- 3.4.4. Or/Nor
- 3.4.5. Xor/Xnor

3.5. Filters
- 3.5.1. Masks and Convolution
- 3.5.2. Linear Filtering
- 3.5.3. Non-Linear Filtering
- 3.5.4. Fourier Analysis

3.6. Morphological Operations
- 3.6.1. Erosion and Dilation
- 3.6.2. Closing and Opening
- 3.6.3. Top_hat and Black hat
- 3.6.4. Contour Detection
- 3.6.5. Skeleton
- 3.6.6. Hole Filling
- 3.6.7. Convex Hull

3.7. Image Analysis Tools
- 3.7.1. Edge Detection
- 3.7.2. Detection of Blobs
- 3.7.3. Dimensional Control
- 3.7.4. Color Inspection

3.8. Object Segmentation
- 3.8.1. Image Segmentation
- 3.8.2. Classical Segmentation Techniques
- 3.8.3. Real Applications

3.9. Image Calibration
- 3.9.1. Image Calibration
- 3.9.2. Methods of Calibration
- 3.9.3. Calibration Process in a 2D Camera/Robot System

3.10. Image Processing in a Real Environment
- 3.10.1. Problem Analysis
- 3.10.2. Image Processing
- 3.10.3. Feature Extraction
- 3.10.4. Final Results

Module 4. Advanced Digital Image Processing

4.1. Optical Character Recognition (OCR)
- 4.1.1. Image Pre-Processing
- 4.1.2. Text Detection
- 4.1.3. Text Recognition

4.2. Code Reading
- 4.2.1. 1D Codes
- 4.2.2. 2D Codes
- 4.2.3. Applications

4.3. Pattern Search
- 4.3.1. Pattern Search
- 4.3.2. Patterns Based on Gray Level
- 4.3.3. Patterns Based on Contours
- 4.3.4. Patterns Based on Geometric Shapes
- 4.3.5. Other Techniques

4.4. Object Tracking with Conventional Vision
- 4.4.1. Background Extraction
- 4.4.2. *Meanshift*
- 4.4.3. *Camshift*
- 4.4.4. *Optical Flow*

4.5. Facial Recognition
- 4.5.1. *Facial Landmark Detection*
- 4.5.2. Applications
- 4.5.3. Facial Recognition
- 4.5.4. Emotion Recognition

4.6. Panoramic and Alignment
- 4.6.1. *Stitching*
- 4.6.2. Image Composition
- 4.6.3. Photomontage

4.7. High Dynamic Range (HDR) and Photometric Stereo
- 4.7.1. Increasing the Dynamic Range
- 4.7.2. Image Compositing for Contour Enhancement
- 4.7.3. Techniques for the Use of Dynamic Applications

4.8. Image Compression
- 4.8.1. Image Compression
- 4.8.2. Types of Compressors
- 4.8.3. Image Compression Techniques

4.9. Video Processing
- 4.9.1. Image Sequences
- 4.9.2. Video Formats and Codecs
- 4.9.3. Reading a Video
- 4.9.4. Frame Processing

4.10. Real Application of Image Processing
- 4.10.1. Problem Analysis
- 4.10.2. Image Processing
- 4.10.3. Feature Extraction
- 4.10.4. Final Results

Module 5. 3D Image Processing

5.1. 3D Imaging
- 5.1.1. 3D Imaging
- 5.1.2. 3D Image Processing Software and Visualizations
- 5.1.3. Metrology Software

5.2. Open3D
- 5.2.1. Library for 3D Data Processing
- 5.2.2. Characteristics
- 5.2.3. Installation and Use

5.3. The Data
- 5.3.1. Depth Maps in 2D Image
- 5.3.2. Pointclouds
- 5.3.3. Normal
- 5.3.4. Surfaces

5.4. Visualization
- 5.4.1. Data Visualization
- 5.4.2. Controls
- 5.4.3. Web Display

5.5. Filters
- 5.5.1. Distance Between Points, Eliminate Outliers
- 5.5.2. High Pass Filter
- 5.5.3. Downsampling

5.6. Geometry and Feature Extraction
- 5.6.1. Extraction of a Profile
- 5.6.2. Depth Measurement
- 5.6.3. Volume
- 5.6.4. 3D Geometric Shapes
- 5.6.5. Shots
- 5.6.6. Projection of a Point
- 5.6.7. Geometric Distances
- 5.6.8. Kd Tree
- 5.6.9. 3D Features

5.7. Registration and Meshing
- 5.7.1. Concatenation
- 5.7.2. ICP
- 5.7.3. Ransac 3D

5.8. 3D Object Recognition
- 5.8.1. Searching for an Object in the 3d Scene
- 5.8.2. Segmentation
- 5.8.3. Bin Picking

5.9. Surface Analysis
- 5.9.1. Smoothing
- 5.9.2. Orientable Surfaces
- 5.9.3. Octree

5.10. Triangulation
- 5.10.1. From Mesh to Point Cloud
- 5.10.2. Depth Map Triangulation
- 5.10.3. Triangulation of Unordered Point Clouds

Module 6. *Deep Learning*

6.1. Artificial Intelligence
- 6.1.1. Machine Learning
- 6.1.2. Deep Learning
- 6.1.3. The Explosion of Deep Learning. Why Now

6.2. Neural Networks
- 6.2.1. The Neural Network
- 6.2.2. Uses of Neural Networks
- 6.2.3. Linear Regression and Perception
- 6.2.4. Forward Propagation
- 6.2.5. Backpropagation
- 6.2.6. Feature Vectors

6.3. Loss Functions
- 6.3.1. Loss Functions
- 6.3.2. Types of Loss Functions
- 6.3.3. Choice of Loss Functions

6.4. Activation Functions
- 6.4.1. Activation Function
- 6.4.2. Linear Functions
- 6.4.3. Non-Linear Functions
- 6.4.4. Output vs. Hidden Layer Activation Functions

6.5. Regularization and Normalization
- 6.5.1. Regularization and Normalization
- 6.5.2. Overfitting and Data Augmentation
- 6.5.3. Regularization Methods: L1, L2 and Dropout
- 6.5.4. Normalization Methods: Batch, Weight, Layer

6.6. Optimization
- 6.6.1. Gradient Descent
- 6.6.2. Stochastic Gradient Descent
- 6.6.3. Mini Batch Gradient Descent
- 6.6.4. Momentum
- 6.6.5. Adam

6.7. Hyperparameter Tuning and Weights
- 6.7.1. Hyperparameters
- 6.7.2. Batch Size vs. Learning Rate vs. Step Decay
- 6.7.3. Weights

6.8. Evaluation Metrics of a Neural Network
- 6.8.1. Accuracy
- 6.8.2. *Dice Coefficient*
- 6.8.3. Sensitivity vs. Specificity / Recall vs. Precision
- 6.8.4. ROC Curve (AUC)
- 6.8.5. F1-Score
- 6.8.6. Matrix Confusion
- 6.8.7. *Cross-Validation*

6.9. Frameworks and Hardware
- 6.9.1. Tensor Flow
- 6.9.2. Pytorch
- 6.9.3. Caffe
- 6.9.4. Keras
- 6.9.5. Hardware for the Training Phase

6.10. Creation of a Neural Network – Training and Validation
- 6.10.1. Dataset
- 6.10.2. Network Construction
- 6.10.3. Education
- 6.10.4. Visualization of Results

Module 7. Convolutional Neural Networks and Image Classification

7.1. Convolutional Neural Networks
- 7.1.1. Introduction
- 7.1.2. Convolution
- 7.1.3. CNN Building Blocks

7.2. Types of CNN Layers
- 7.2.1. *Convolutional*
- 7.2.2. *Activation*
- 7.2.3. *Batch Normalization*
- 7.2.4. *Polling*
- 7.2.5. *Fully Connected*

7.3. Metrics
- 7.3.1. Matrix Confusion
- 7.3.2. *Accuracy*
- 7.3.3. Precision
- 7.3.4. *Recall*
- 7.3.5. F1 Score
- 7.3.6. ROC Curve
- 7.3.7. AUC

7.4. Main Architectures
- 7.4.1. *AlexNet*
- 7.4.2. VGG
- 7.4.3. *Resnet*
- 7.4.4. *GoogleLeNet*

7.5. Image Classification
- 7.5.1. Introduction
- 7.5.2. Analysis of Data
- 7.5.3. Data Preparation
- 7.5.4. Model Training
- 7.5.5. Model Validation

7.6. Practical Considerations for CNN Training
- 7.6.1. Optimizer Selection
- 7.6.2. *Learning Rate Scheduler*
- 7.6.3. Check Training Pipeline
- 7.6.4. Training with Regularization

7.7. Best Practices in Deep Learning
- 7.7.1. *Transfer Learning*
- 7.7.2. *Fine Tuning*
- 7.7.3. *Data Augmentation*

7.8. Statistical Data Evaluation
- 7.8.1. Number of Datasets
- 7.8.2. Number of Labels
- 7.8.3. Number of Images
- 7.8.4. Data Balancing

7.9. *Deployment*
- 7.9.1. Saving and Loading Models
- 7.9.2. Onnx
- 7.9.3. Inference

7.10. Practical Case: Image Classification
- 7.10.1. Data Analysis and Preparation
- 7.10.2. Testing the Training Pipeline
- 7.10.3. Model Training
- 7.10.4. Model Validation

Module 8. Object Detection

8.1. Object Detection and Tracking
- 8.1.1. Object Detection
- 8.1.2. Use Cases
- 8.1.3. Object Tracking
- 8.1.4. Use Cases
- 8.1.5. Occlusions, Rigid and Non-Rigid Poses

8.2. Assessment Metrics
- 8.2.1. IOU - Intersection Over Union
- 8.2.2. Confidence Score
- 8.2.3. Recall
- 8.2.4. Precision
- 8.2.5. Recall-Precision Curve
- 8.2.6. Mean Average Precision (mAP)

8.3. Traditional Methods
- 8.3.1. Sliding Window
- 8.3.2. Viola Detector
- 8.3.3. HOG
- 8.3.4. Non Maximal Supression (NMS)

8.4. Datasets
- 8.4.1. Pascal VC
- 8.4.2. MS Coco
- 8.4.3. ImageNet (2014)
- 8.4.4. MOTA Challenge

8.5. Two Shot Object Detector
- 8.5.1. R-CNN
- 8.5.2. Fast R-CNN
- 8.5.3. Faster R-CNN
- 8.5.4. Mask R-CNN

8.6. Single Shot Object Detector
- 8.6.1. SSD
- 8.6.2. YOLO
- 8.6.3. RetinaNet
- 8.6.4. CenterNet
- 8.6.5. EfficientDet

8.7. Backbones
- 8.7.1. VGG
- 8.7.2. ResNet
- 8.7.3. Mobilenet
- 8.7.4. Shufflenet
- 8.7.5. Darknet

8.8. Object Tracking
- 8.8.1. Classical Approaches
- 8.8.2. Particulate Filters
- 8.8.3. Kalman
- 8.8.4. Sort Tracker
- 8.8.5. Deep Sort

8.9. Deployment
- 8.9.1. Computing Platform
- 8.9.2. Choice of Backbone
- 8.9.3. Choice of Framework
- 8.9.4. Model Optimization
- 8.9.5. Model Versioning

8.10. Study: People Detection and Tracking
- 8.10.1. Detection of People
- 8.10.2. Monitoring of People
- 8.10.3. Re-Identification
- 8.10.4. Counting People in Crowds

Module 9. Image Segmentation with Deep Learning

9.1. Object Detection and Segmentation
- 9.1.1. Semantic Segmentation
  - 9.1.1.1. Semantic Segmentation Use Cases
- 9.1.2. Instantiated Segmentation
  - 9.1.2.1. Instantiated Segmentation Use Cases

9.2. Evaluation Metrics
- 9.2.1. Similarities with Other Methods
- 9.2.2. Pixel Accuracy
- 9.2.3. Dice Coefficient (F1 Score)

9.3. Cost Functions
- 9.3.1. Dice Loss
- 9.3.2. Focal Loss
- 9.3.3. Tversky Loss
- 9.3.4. Other Functions

9.4. Traditional Segmentation Methods
- 9.4.1. Threshold Application with Otsu and Riddlen
- 9.4.2. Self-Organized Maps
- 9.4.3. GMM-EM Algorithm

9.5. Semantic Segmentation Applying Deep Learning: FCN
- 9.5.1. FCN
- 9.5.2. Architecture
- 9.5.3. FCN Applications

9.6. Semantic Segmentation Applying Deep Learning: U-NET
- 9.6.1. U-NET
- 9.6.2. Architecture
- 9.6.3. U-NET Application

9.7. Semantic Segmentation Applying Deep Learning: Deep Lab
- 9.7.1. Deep Lab
- 9.7.2. Architecture
- 9.7.3. Deep Lab Application

9.8. Instantiated Segmentation Applying Deep Learning: Mask RCNN
- 9.8.1. Mask RCNN
- 9.8.2. Architecture
- 9.8.3. Application of a Mask RCNN

9.9. Video Segmentation
- 9.9.1. STFCN
- 9.9.2. Semantic Video CNNs
- 9.9.3. Clockwork Convnets
- 9.9.4. Low-Latency

9.10. Point Cloud Segmentation
- 9.10.1. The Point Cloud
- 9.10.2. PointNet
- 9.10.3. A-CNN

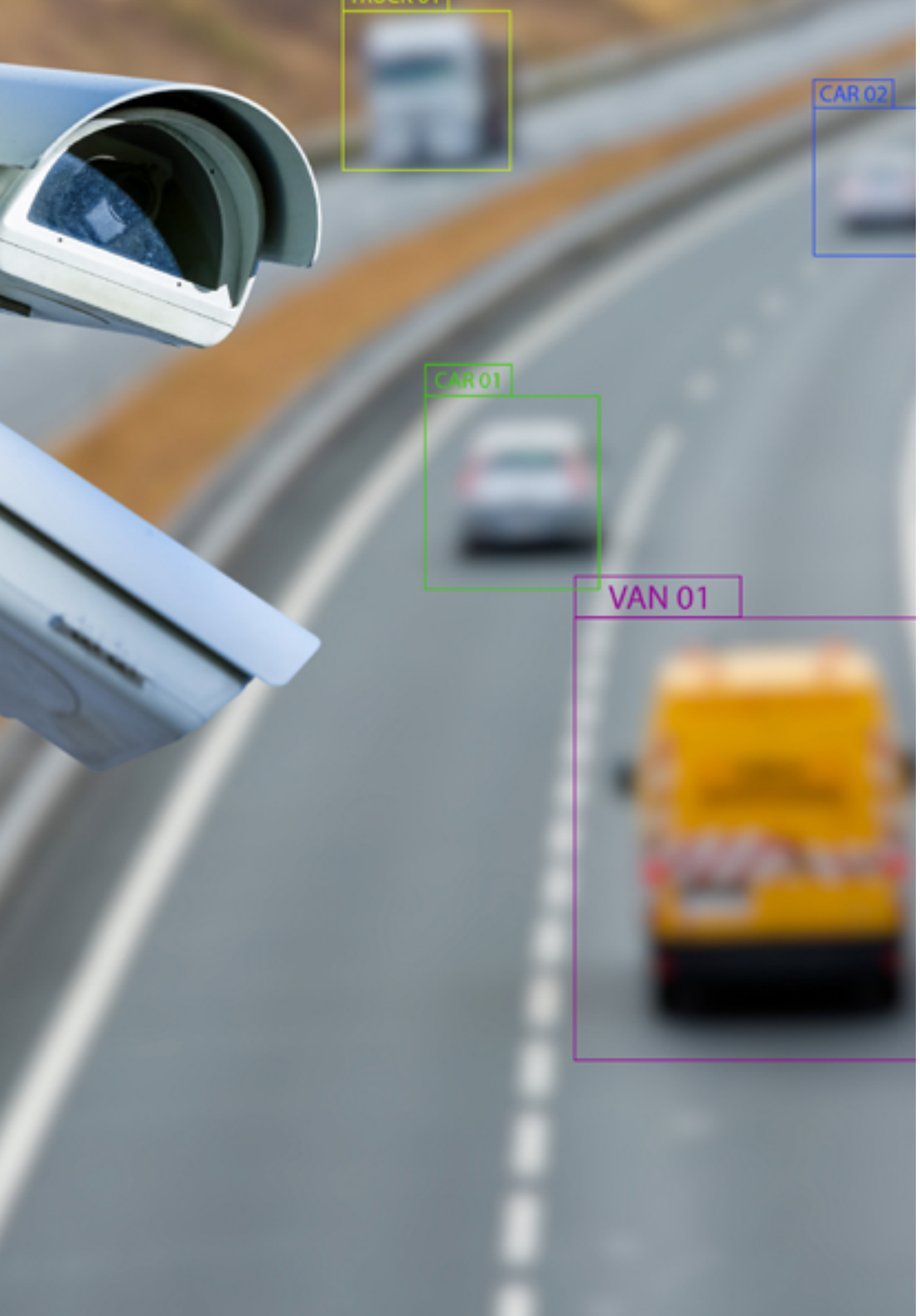
Module 10. Advanced Image Segmentation and Advanced Computer Vision Techniques

10.1. Database for General Segmentation Problems
- 10.1.1. Pascal Context
- 10.1.2. CelebAMask-HQ
- 10.1.3. Cityscapes Dataset
- 10.1.4. CCP Dataset

10.2. Semantic Segmentation in Medicine
- 10.2.1. Semantic Segmentation in Medicine
- 10.2.2. Datasets for Medical Problems
- 10.2.3. Practical Application

10.3. Annotation Tools
- 10.3.1. Computer Vision Annotation Tool
- 10.3.2. LabelMe
- 10.3.3. Other Tools

10.4. Segmentation Tools Using Different Frameworks
- 10.4.1. Keras
- 10.4.2. Tensorflow v2
- 10.4.3. Pytorch
- 10.4.4. Other



10.5. Semantic Segmentation Project. The Data, Phase 1
- 10.5.1. Problem Analysis
- 10.5.2. Input Source for Data
- 10.5.3. Data Analysis
- 10.5.4. Data Preparation

10.6. Semantic Segmentation Project. Training, Phase 2
- 10.6.1. Algorithm Selection
- 10.6.2. Education
- 10.6.3. Evaluation

10.7. Semantic Segmentation Project. Results, Phase 3
- 10.7.1. Fine Tuning
- 10.7.2. Presentation of The Solution
- 10.7.3. Conclusions

10.8. Autoencoders
- 10.8.1. Autoencoders
- 10.8.2. Autoencoder Architecture
- 10.8.3. Noise Elimination Autoencoders
- 10.8.4. Automatic Coloring Autoencoder

10.9. Generative Adversarial Networks (GANs)
- 10.9.1. Generative Adversarial Networks (GANs)
- 10.9.2. DCGAN Architecture
- 10.9.3. Conditional GAN Architecture

10.10. Enhanced Generative Adversarial Networks
- 10.10.1. Overview of the Problem
- 10.10.2. WGAN
- 10.10.3. LSGAN
- 10.10.4. ACGAN

04

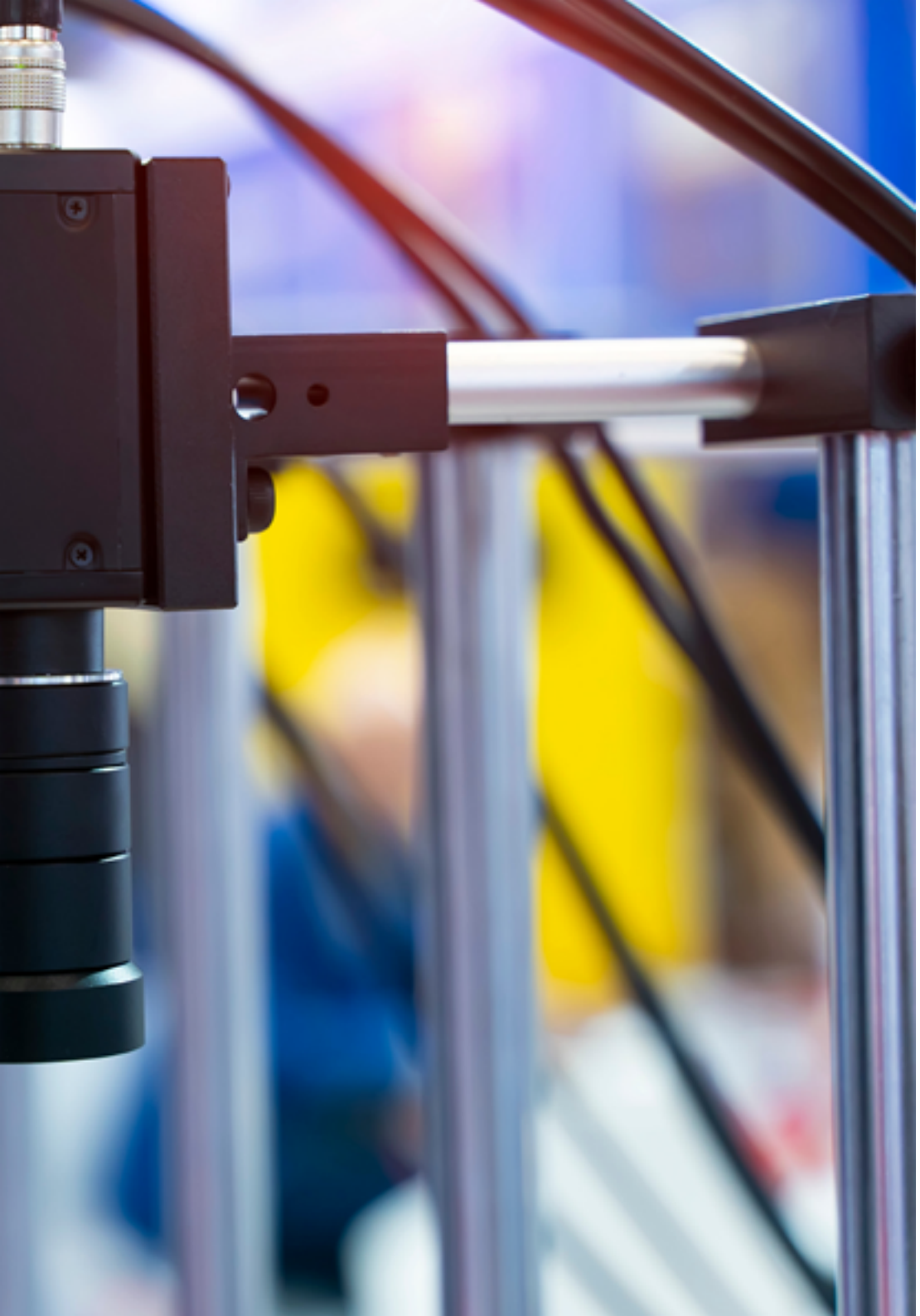
Teaching Objectives

The objectives of this program have been designed to foster a deep understanding of Computer Vision systems, from their mathematical foundations to their most advanced applications. Through a dynamic methodological structure, the program aims not only to consolidate technical knowledge but also to enhance analytical skills focused on solving complex problems. Additionally, it promotes the integration of interdisciplinary approaches that connect Computer Science with fields such as robotics, healthcare, and Industry 4.0. In this way, a solid preparation is guaranteed to tackle emerging technological challenges in increasingly automated and visual environments.

You will analyze real-time visual data using video processing tools, extracting useful information"

General Objectives

- Obtain an overview of the devices and hardware used in the computer vision world
- Analyze the different fields in which vision is applied
- Identify where the technological advances in vision are at the moment
- Assess what is being researched and what the next few years hold
- Establish a solid foundation in the understanding of digital image processing algorithms and techniques.
- Use fundamental computer vision techniques
- Distinguish advanced image processing techniques
- Introducing the open 3D library
- Analyze the advantages and difficulties of working in 3D instead of 2D
- Introduce neural networks and examine how they work



Specific Objectives

Module 1. Computer Vision

- Establish how the human vision system works and how an image is digitized
- Analyze the evolution of computer vision
- Evaluate image acquisition techniques
- Generate specialized knowledge about illumination systems as an important factor when processing an image

Module 2. Applications and State-of-the-Art

- Analyze the use of computer vision in industrial applications
- Determine how vision is applied in the autonomous vehicle revolution
- Analyze images in content analysis
- Develop Deep Learning algorithms for medical analysis and Machine Learning algorithms for operating room assistance

Module 3. Digital Image Processing

- Examine commercial and open-source digital image processing libraries
- Determine what a digital image is and evaluate the fundamental operations to be able to work with them
- Introduce image filters
- Analyze the importance and use of histograms

Module 4. Advanced Digital Image Processing

- Examine advanced digital image processing filters
- Determine contour extraction and analysis tools
- Analyze object search algorithms
- Demonstrate how to work with calibrated images

Module 5. 3D Image Processing

- Examine a 3D image
- Analyze the software used for 3D data processing
- Developing open3D
- Determine the relevant data in a 3D image

Module 6. *Deep Learning*

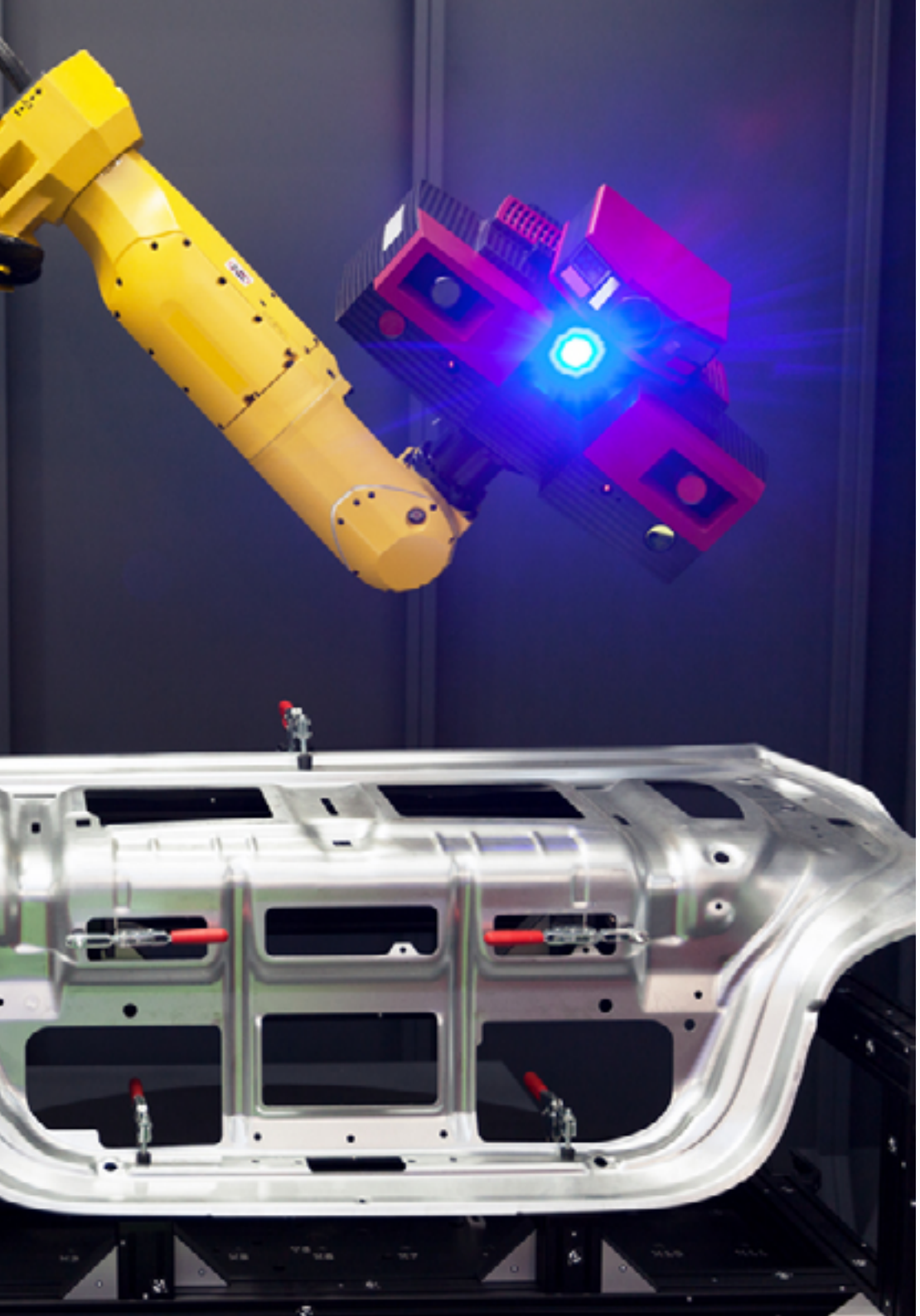
- Analyze the families that make up the artificial intelligence world
- Compile the main frameworks of Deep Learning
- Define neural networks
- Present the learning methods of neural networks

Module 7. Convolutional Neural Networks and Image Classification

- Generate specialized knowledge on convolutional neural networks
- Establish evaluation metrics
- Analyze the performance of CNNs for image classification
- Evaluate Data Augmentation
- Propose techniques to avoid Overfitting
- Examine different architectures

Module 8. Object Detection

- Analyze how object detection networks work
- Examine traditional methods
- Determine evaluation metrics
- Identify the main datasets used in the marketplace



Module 9. Image Segmentation with Deep Learning

- Analyze how semantic segmentation networks work
- Evaluate traditional methods
- Examine evaluation metrics and different architectures
- Apply theoretical concepts through various examples

Module 10. Advanced Image Segmentation and Advanced Computer Vision Techniques

- Generate specialized knowledge on the handling of tools
- Examine Semantic Segmentation in medicine
- Identify the structure of a segmentation project
- Analyze Autoencoders

You will stand out for your ethical approach to the use of visual technologies, respecting privacy and algorithmic transparency"

05

Career Opportunities

Computer Vision has become one of the most promising fields within technology, driven by the rise of automation, artificial intelligence, and deep learning. In this context, career opportunities range from the development of visual recognition systems in the automotive industry to the optimization of industrial processes through automated inspection. Moreover, sectors such as security, computational medicine, and smart agriculture demand profiles with specific competencies in this field. Therefore, opportunities arise in technology companies, innovation labs, and development centers linked to intelligent image processing.

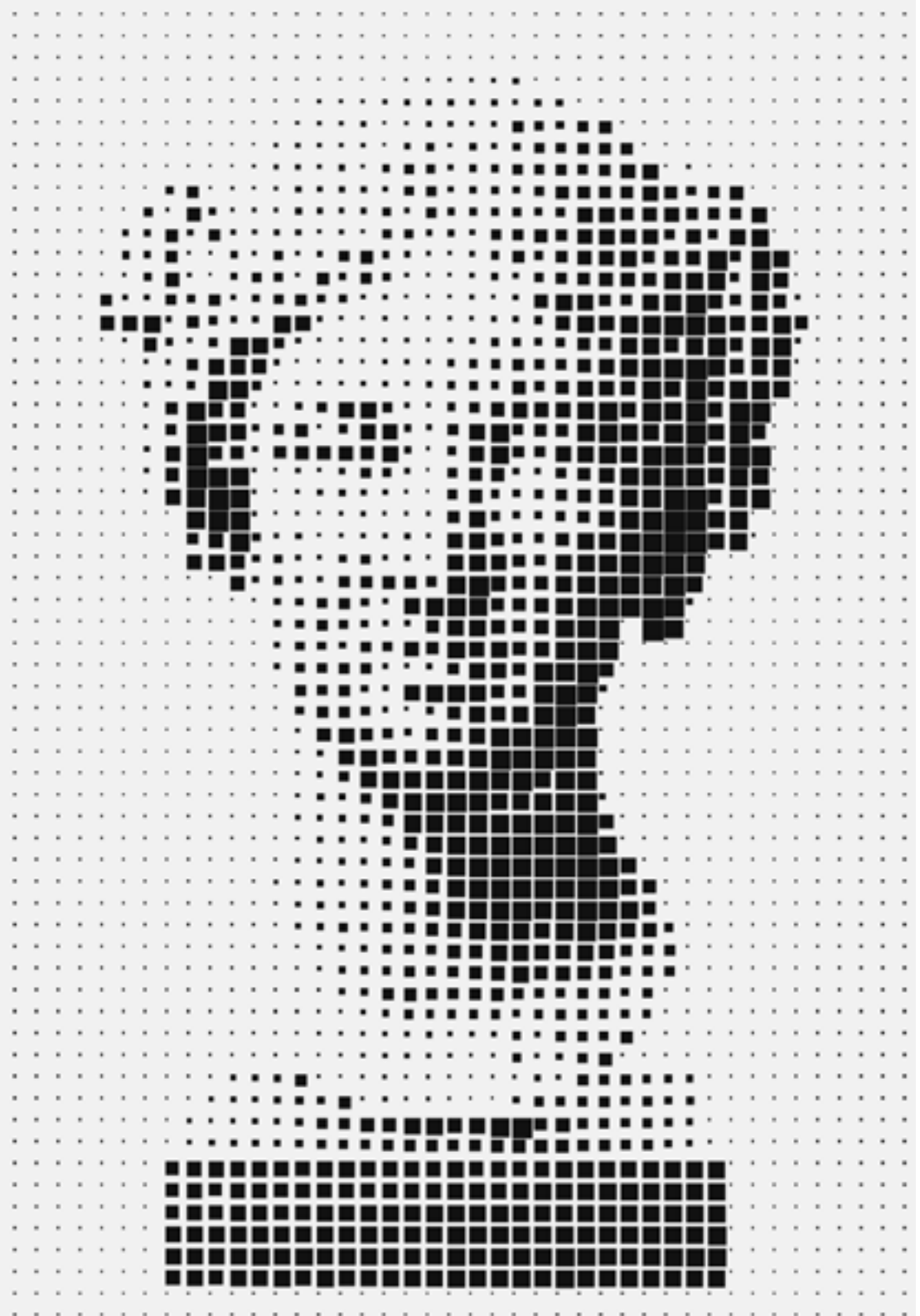
Are you looking to work as an Image Processing Systems Developer? Achieve this through this academic pathway in just a few months"

Graduate Profile

The profile of a graduate from this program is defined by a strong ability to design, implement, and optimize Computer Vision systems applicable to complex and dynamic environments. Thanks to a multidisciplinary approach, graduates develop advanced competencies in image processing, machine learning, and visual data analysis. Additionally, they acquire key skills in programming, algorithm integration, and problem-solving with a results-oriented focus. This combination enables them to adapt to various productive sectors and lead technological projects that require precision, efficiency, and autonomy in the automated visual interpretation of the environment.

You will integrate visual systems in industrial settings for quality control, traceability, defect detection, and robotics.

- **Adaptability to Change:** The ability to integrate new technologies and methodologies in dynamic contexts.
- **Teamwork:** Skills to collaborate on interdisciplinary projects with specialists from various fields.
- **Time Management:** Efficient organization of tasks and resources in demanding academic and professional environments.
- **Computational Thinking:** A logical and structured approach to solving problems through algorithm- and data-based solutions.



After completing the university program, you will be able to apply your knowledge and skills in the following positions:

1. **Computer Vision Engineer:** Develops and implements systems that enable machines to interpret images and videos in real time.
2. **Image Processing Specialist:** Works on the enhancement, analysis, and transformation of digital images for use across various sectors.
3. Machine Learning Engineer for Vision: Designs machine learning models focused on visual interpretation.
4. **Software Developer for Vision Systems:** Creates technological solutions that integrate Computer Vision into devices and platforms.
5. **Artificial Intelligence Consultant:** Advises companies on the implementation of intelligent visual systems to optimize processes.
6. **Industrial Automation Specialist with Computer Vision:** Applies visual technologies for the control and monitoring of automated processes.

Integrates knowledge of sensors, optics, digital cameras, and visual processing architectures to build complex systems adaptable to various operational environments"

06

Software Licenses Included

TECH is a leading reference in the academic world for combining the latest technology with teaching methodologies to enhance the teaching-learning process. To achieve this, it has established a network of alliances that grants access to the most advanced software tools used in the professional world.

Upon enrolling, you will receive, completely free of charge, academic credentials for the following professional software applications"

TECH has established a network of professional alliances with the leading providers of software applied to various professional fields. These alliances allow TECH to access hundreds of software applications and licenses, making them available to its students.

The academic software licenses will allow students to access the most advanced applications in their professional field, enabling them to become proficient in their use without incurring additional costs. TECH will manage the contracting process, allowing students to use these applications without limitation throughout their studies in the Professional Master's Degree in Computer Vision, with full access provided completely free of charge.

TECH will provide free access to the following software applications:

Google Career Launchpad

Google Career Launchpad is a solution for developing digital skills in technology and data analysis. With an estimated value of **5,000 dollars**, it is included **for free** in TECH's university program, providing access to interactive labs and certifications recognized in the industry.

This platform combines technical training with practical cases, using technologies such as BigQuery and Google AI. It offers simulated environments to work with real data, along with a network of experts for personalized guidance.

Key Features:

- **Specialized Courses:** Updated content in cloud computing, machine learning, and data analysis
- **Live Labs:** Hands-on practice with real Google Cloud tools, no additional configuration required
- **Integrated Certifications:** Preparation for official exams with international validity
- **Professional Mentoring:** Sessions with Google experts and technology partners
- **Collaborative Projects:** Challenges based on real-world problems from leading companies

In conclusion, **Google Career Launchpad** connects users with the latest market technologies, facilitating their entry into fields such as artificial intelligence and data science with industry-backed credentials.

Thanks to TECH, you will be able to use the best professional software applications in your field for free"

07

Study Methodology

TECH is the world's first university to combine the **case study** methodology with **Relearning**, a 100% online learning system based on guided repetition.

This disruptive pedagogical strategy has been conceived to offer professionals the opportunity to update their knowledge and develop their skills in an intensive and rigorous way. A learning model that places students at the center of the educational process giving them the leading role, adapting to their needs and leaving aside more conventional methodologies.

TECH will prepare you to face new challenges in uncertain environments and achieve success in your career"

The student: the priority of all TECH programs

In TECH's study methodology, the student is the main protagonist.
The teaching tools of each program have been selected taking into account the demands of time, availability and academic rigor that, today, not only students demand but also the most competitive positions in the market.

With TECH's asynchronous educational model, it is students who choose the time they dedicate to study, how they decide to establish their routines, and all this from the comfort of the electronic device of their choice. The student will not have to participate in live classes, which in many cases they will not be able to attend. The learning activities will be done when it is convenient for them. They can always decide when and from where they want to study.

"At TECH you will NOT have live classes (which you might not be able to attend)"

The most comprehensive study plans at the international level

TECH is distinguished by offering the most complete academic itineraries on the university scene. This comprehensiveness is achieved through the creation of syllabi that not only cover the essential knowledge, but also the most recent innovations in each area.

By being constantly up to date, these programs allow students to keep up with market changes and acquire the skills most valued by employers. In this way, those who complete their studies at TECH receive a comprehensive education that provides them with a notable competitive advantage to further their careers.

And what's more, they will be able to do so from any device, pc, tablet or smartphone.

> *TECH's model is asynchronous, so it allows you to study with your pc, tablet or your smartphone wherever you want, whenever you want and for as long as you want"*

Case Studies and Case Method

The case method has been the learning system most used by the world's best business schools. Developed in 1912 so that law students would not only learn the law based on theoretical content, its function was also to present them with real complex situations. In this way, they could make informed decisions and value judgments about how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

With this teaching model, it is students themselves who build their professional competence through strategies such as Learning by Doing or Design Thinking, used by other renowned institutions such as Yale or Stanford.

This action-oriented method will be applied throughout the entire academic itinerary that the student undertakes with TECH. Students will be confronted with multiple real-life situations and will have to integrate knowledge, research, discuss and defend their ideas and decisions. All this with the premise of answering the question of how they would act when facing specific events of complexity in their daily work.

Relearning Methodology

At TECH, case studies are enhanced with the best 100% online teaching method: Relearning.

This method breaks with traditional teaching techniques to put the student at the center of the equation, providing the best content in different formats. In this way, it manages to review and reiterate the key concepts of each subject and learn to apply them in a real context.

In the same line, and according to multiple scientific researches, reiteration is the best way to learn. For this reason, TECH offers between 8 and 16 repetitions of each key concept within the same lesson, presented in a different way, with the objective of ensuring that the knowledge is completely consolidated during the study process.

Relearning will allow you to learn with less effort and better performance, involving you more in your specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to success.

A 100% online Virtual Campus with the best teaching resources

In order to apply its methodology effectively, TECH focuses on providing graduates with teaching materials in different formats: texts, interactive videos, illustrations and knowledge maps, among others. All of them are designed by qualified teachers who focus their work on combining real cases with the resolution of complex situations through simulation, the study of contexts applied to each professional career and learning based on repetition, through audios, presentations, animations, images, etc.

The latest scientific evidence in the field of Neuroscience points to the importance of taking into account the place and context where the content is accessed before starting a new learning process. Being able to adjust these variables in a personalized way helps people to remember and store knowledge in the hippocampus to retain it in the long term. This is a model called Neurocognitive context-dependent e-learning that is consciously applied in this university qualification.

In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

Likewise, this very complete Virtual Campus will allow TECH students to organize their study schedules according to their personal availability or work obligations. In this way, they will have global control of the academic content and teaching tools, based on their fast-paced professional update.

"The online study mode of this program will allow you to organize your time and learning pace, adapting it to your schedule"

The effectiveness of the method is justified by four fundamental achievements:

1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that assess real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.

The university methodology top-rated by its students

The results of this innovative teaching model can be seen in the overall satisfaction levels of TECH graduates.

The students' assessment of the teaching quality, the quality of the materials, the structure of the program and its objectives is excellent. Not surprisingly, the institution became the top-rated university by its students according to the global score index, obtaining a 4.9 out of 5.

Access the study contents from any device with an Internet connection (computer, tablet, smartphone) thanks to the fact that TECH is at the forefront of technology and teaching.

You will be able to learn with the advantages that come with having access to simulated learning environments and the learning by observation approach, that is, Learning from an expert.

As such, the best educational materials, thoroughly prepared, will be available in this program:

Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.

Practicing Skills and Abilities

You will carry out activities to develop specific competencies and skills in each thematic field. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop within the framework of the globalization we live in.

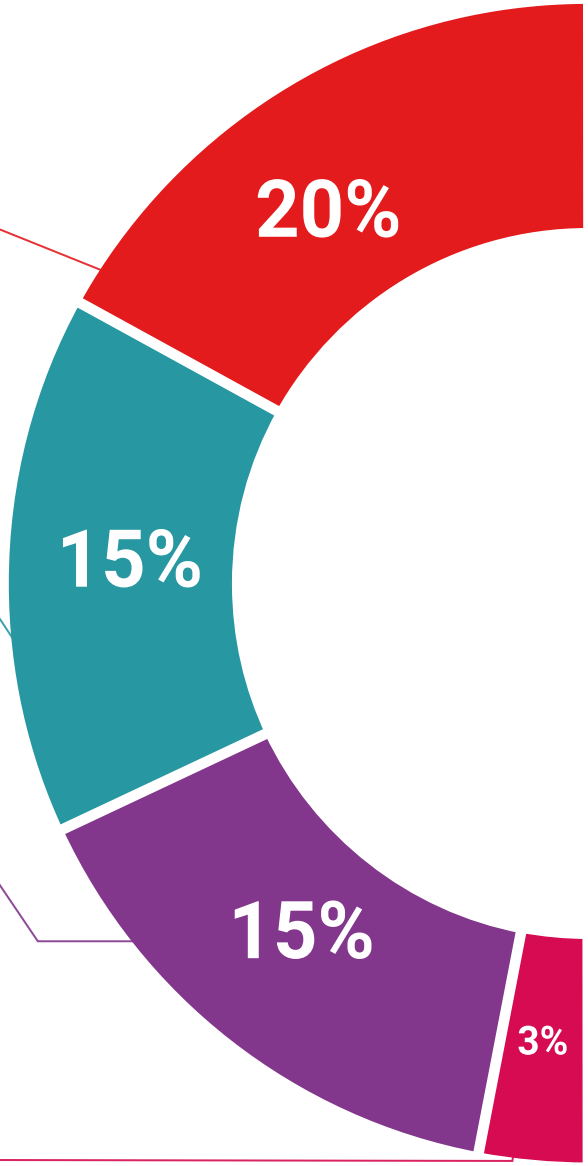
Interactive Summaries

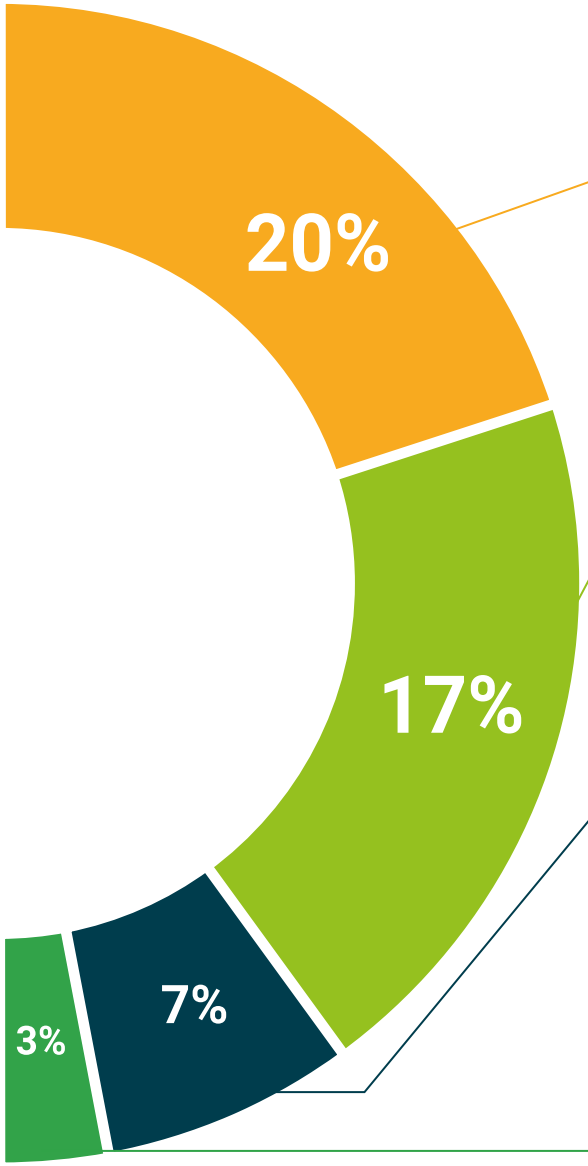
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".

Additional Reading

Recent articles, consensus documents, international guides... In our virtual library you will have access to everything you need to complete your education.





Case Studies

Students will complete a selection of the best case studies in the field. Cases that are presented, analyzed, and supervised by the best specialists in the world.

Testing & Retesting

We periodically assess and re-assess your knowledge throughout the program. We do this on 3 of the 4 levels of Miller's Pyramid.

Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

Learning from an expert strengthens knowledge and memory, and generates confidence for future difficult decisions.

Quick Action Guides

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical and effective way to help students progress in their learning.

08

Teaching Staff

The faculty of this program stands out for its solid track record and direct experience in technological innovation projects related to Computer Vision. Thanks to their involvement in the industry and applied research groups, they bring an up-to-date and highly technical perspective on the sector. Moreover, the team combines profiles with experience in leading companies and development centers, ensuring a practical approach aligned with market demands. As such, interacting with these experts not only enriches the content but also provides an integrated understanding of the real-world challenges facing modern visual computing.

The faculty team of this Professional Master's Degree stands out for its extensive professional experience in Computer Vision"

Management

Mr. Redondo Cabanillas, Sergio

- Specialist in Machine Vision Research and Development at BCN Vision
- Development and Backoffice Team Leader at BCN Vision
- Project and Development Director of Machine Vision Solutions
- Sound Technician at Media Arts Studio
- Technical Engineering in Telecommunications with specialization in Image and Sound by the Polytechnic University of Catalonia
- Degree in Artificial Intelligence applied to Industry from the Autonomous University of Barcelona
- Higher Grade Training Cycle in Sound by CP Villar

Teachers

Mr. Gutiérrez Olabarría, José Ángel

- Project Management, Software Analysis and Design and C Programming of Quality Control and Industrial Informatics Applications
- Specialist Engineer in Machine Vision and Sensors
- Market Manager of the Iron and Steel Sector, performing functions of Customer Contact, Recruitment, Market Plans and Strategic Accounts
- Computer Engineer by the University of Deusto
- Master's Degree in Robotics and Automation from ETSII/IT of Bilbao
- Diploma in Advanced Studies in Automation and Electronics Doctorate Program by ETSII/IT of Bilbao

Mr. Enrich Llopart, Jordi

- Chief Technology Officer of Bcnvision - Computer Vision
- Project and application engineer Bcnvision - Machine Vision
- Project and application engineer PICVISA Machine Vision
- Degree in Telecommunications Technical Engineering Specialization in Image and Sound by the University School of Engineering of Terrassa (EET) / Polytechnic University of Catalonia (UPC)
- MPM - Master in Project Management. La Salle University - Ramon Llull University

Ms. Riera i Marín, Meritxell

- Deep Learning Systems Developer at Sycai Medical
- Researcher at Centre National de la Recherche Scientifique (CNRS), France
- Software Engineer at Zhilabs
- IT Technician, Mobile World Congress
- Software Engineer at Avanade
- Engineering of Telecommunications by the Polytechnic University of Catalonia
- *Master of Science:* Signal, Image, Embedded Systems and Automation Specialization (SISEA) at IMT Atlantique, France
- Master's Degree in of Telecommunications Engineering from the Polytechnic University of Catalonia

Mr. González González, Diego Pedro

- Software Architect for Artificial Intelligence based systems
- Deep Learning and Machine Learning Application Developer
- Software architect for embedded systems for railway safety applications
- Linux driver developer
- Systems engineer for railway track equipment
- Embedded Systems Engineer
- Deep Learning Engineer
- Official Master's Degree in Artificial Intelligence from the International University of La Rioja
- Industrial Engineer by Miguel Hernández University

Ms. García Moll, Clara

- Junior Visual Computer Engineer at LabLENI
- Computer Vision Engineer. Satellogic
- Full Stack Developer. Grupo Catfons
- Audiovisual Systems Engineering. Pompeu Fabra University (Barcelona).
- Master's Degree in Computer Vision. Autonomous University of Barcelona

Mr. Higón Martínez, Felipe

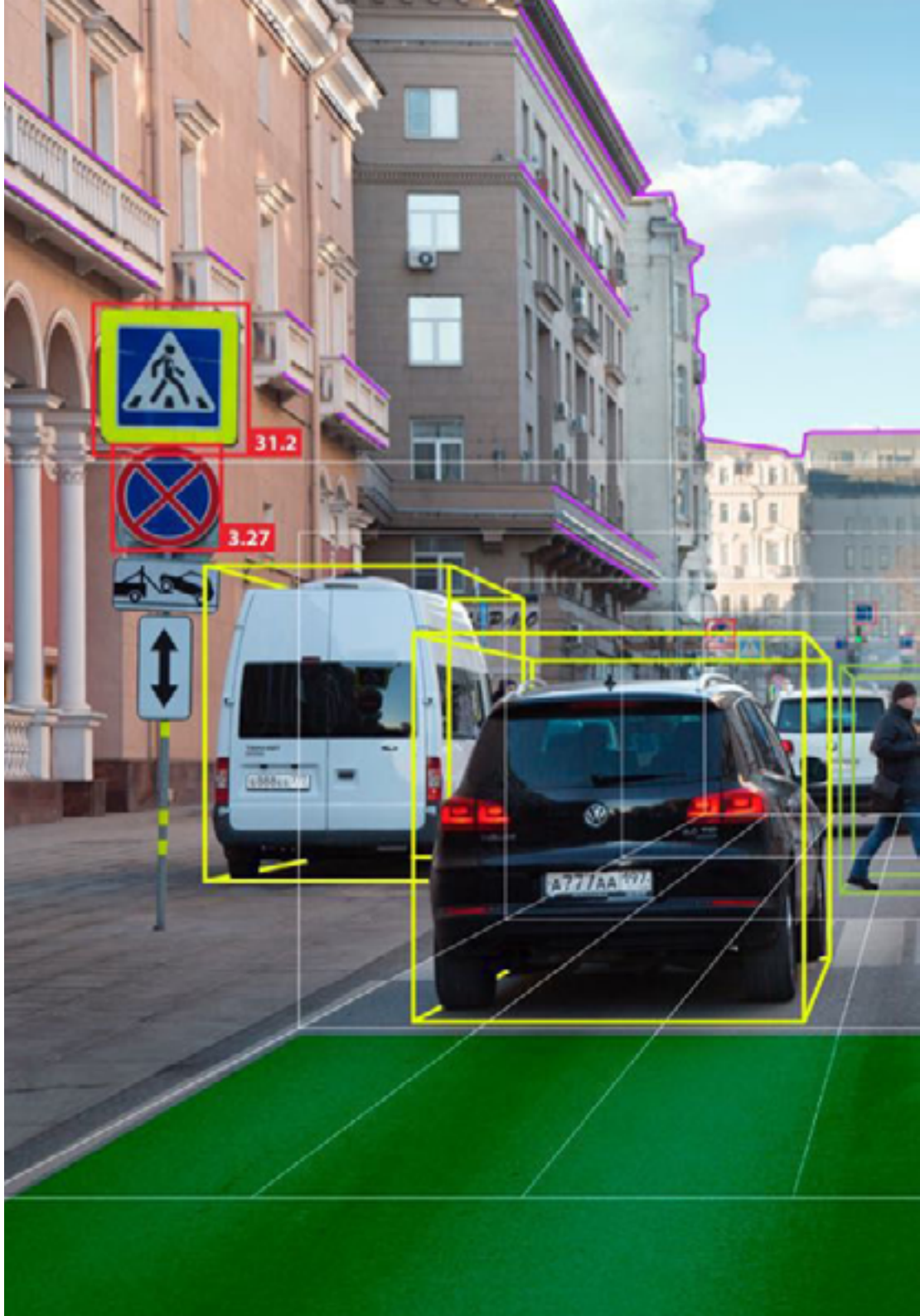
- Electronics, Telecommunications and Computer Engineer
- Validation and Prototyping Engineer
- Applications Engineer
- Support Engineer
- Master's Degree in Advanced and Applied Artificial Intelligence by IA3
- Technical Engineer in Telecommunications
- Degree in Electronic Engineering from the University of Valencia.

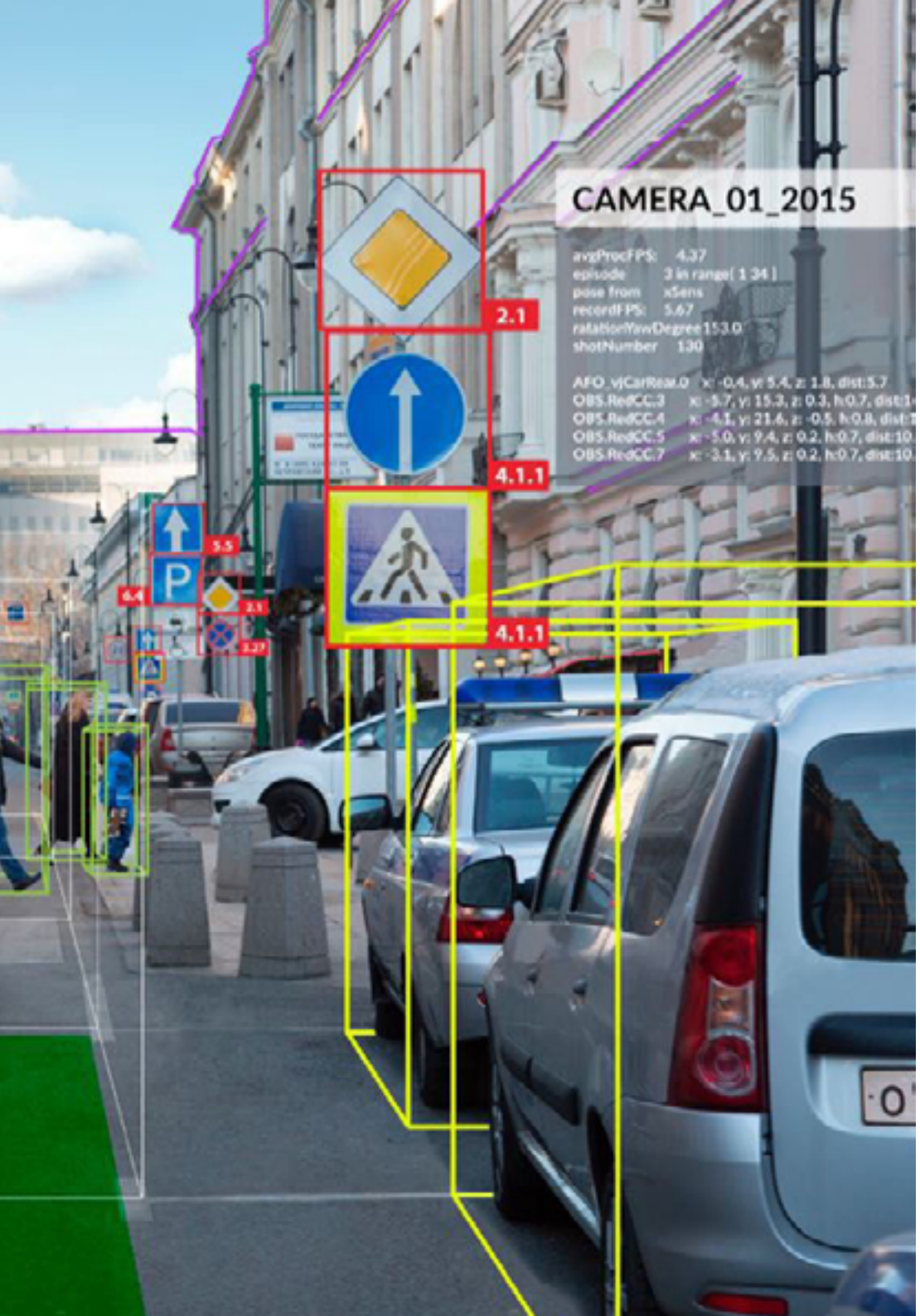
Mr. Delgado Gonzalo, Guillem

- Computer Vision and Artificial Intelligence Researcher at Vicomtech
- Computer Vision and Artificial Intelligence Engineer at Gestoos
- Junior Engineer at Sogeti
- Graduated in Audiovisual Systems Engineering at the Polytechnic University of Catalonia.
- MSc in Computer Vision at Universitat Autónoma de Barcelona
- Degree in Computer Science at Aalto University
- Degree in Audiovisual Systems UPC - ETSETB Telecos BCN

Mr. Bigata Casademunt, Antoni

- Perception Engineer at Computer Vision Center (CVC)
- Machine Learning Engineer at Visium SA, Switzerland
- Degree in Microtechnology from Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland
- Master's Degree in Robotics from the Ecole Polytechnique Fédérale de Lausanne (EPFL)





Mr. Solé Gómez, Àlex

- Researcher at Vicomtech in the Intelligent Security Video Analytics department
- MSc in Telecommunications Engineering, mention in Audiovisual Systems from the Polytechnic University of Catalonia
- BSc in Telecommunications Technologies and Services Engineering, mention in Audiovisual Systems from the Polytechnic University of Catalonia

Mr. Olivo García, Alejandro

- Vision Application Engineer at Bcnvision
- Degree in Industrial Technologies Engineering from the School of Industrial Engineering of the Polytechnic University of Cartagena
- Master's Degree in Industrial Engineering from the School of Industrial Engineering of the Polytechnic University of Cartagena
- Research Chair Scholarship for the company MTorres
- Programming in C# .NET in Computer Vision Applications

A unique, essential and decisive learning experience to boost your professional development"

09

Certificate

The Professional Master's Degree in Computer Vision guarantees students, in addition to the most rigorous and up-to-date education, access to a diploma for the Professional Master's Degree issued by TECH Global University.

Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"

This private qualification will allow you to obtain a **Professional Master's Degree in Computer Vision** endorsed by **TECH Global University**, the world's largest online university.

TECH Global University is an official European University publicly recognized by the Government of Andorra (***official bulletin***). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** private qualification is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

TECH is a member of the Society for the Study of Artificial Intelligence and Simulation of Behavior (AISB), the largest organization dedicated to the research and development of Artificial Intelligence in Europe. As part of its membership, TECH provides students with access to a large number of doctoral-level research projects, online conferences, master classes, and a network of teachers and professionals who will continuously contribute to students' professional development through ongoing support and guidance.

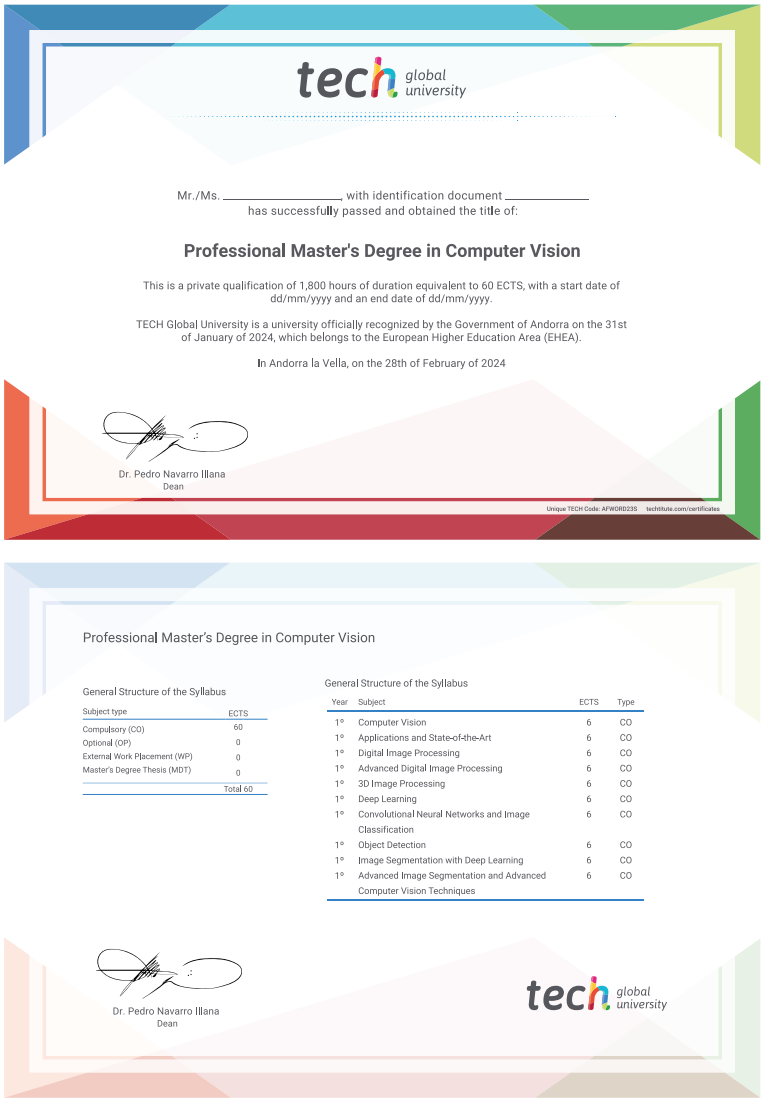
TECH is a member of:

Title: **Professional Master's Degree in Computer Vision**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**



tech global university

Mr./Ms. _____ with identification document _____
has successfully passed and obtained the title of:

Professional Master's Degree in Computer Vision

This is a private qualification of 1,800 hours of duration equivalent to 60 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Dean

Unique TECH Code: AFWOR023S techtitute.com/certificates

Professional Master's Degree in Computer Vision

General Structure of the Syllabus

Subject type	ECTS
Compulsory (CO)	60
Optional (OP)	0
External Work Placement (WP)	0
Master's Degree Thesis (MDT)	0
Total	60

General Structure of the Syllabus

Year	Subject	ECTS	Type
1°	Computer Vision	6	CO
1°	Applications and State-of-the-Art	6	CO
1°	Digital Image Processing	6	CO
1°	Advanced Digital Image Processing	6	CO
1°	3D Image Processing	6	CO
1°	Deep Learning	6	CO
1°	Convolutional Neural Networks and Image Classification	6	CO
1°	Object Detection	6	CO
1°	Image Segmentation with Deep Learning	6	CO
1°	Advanced Image Segmentation and Advanced Computer Vision Techniques	6	CO

Dr. Pedro Navarro Illana
Dean

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*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.

tech global university

Professional Master's Degree
Computer Vision

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Accreditation: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Professional Master's Degree

Computer Vision

Accreditation/Membership

The Society for the Study
of Artificial Intelligence
and Simulation of Behaviour

tech global university