Hybrid Professional Master's Degree
Computer Vision

tech global university

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Hybrid Professional Master's Degree

Computer Vision

Modality: **Hybrid (Online + Clinical Internship)**

Duration: **12 months**

Certificate: **TECH Global University**

60 + 5 ECTS Credits

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

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01

Introduction

The efforts of millions of computer professionals to create a system through which computers can perceive and understand one or more images and act on them in a certain way is what has allowed the development of Computer Vision. The industrial and non-industrial applications of this scientific discipline are becoming more and more extensive, as a function of the evolution of technology and the complex algorithms that make up Deep Learning, so that the demand for professionals who master it is growing every year. For this reason, TECH and its team of engineers have developed this comprehensive program, which combines 100% online theory and practice in a prestigious center in more than 1,500 hours of the best training. A unique and key opportunity for your professional development that will mark a before and after in your career.

You are just a few steps away from immersing yourself in a unique academic experience with which you will acquire the theoretical and practical knowledge necessary to excel as an expert in Computer Vision"

The evolution of artificial intelligence and Machine Learning, as well as the increasingly technical and specialized growth of robotics, augmented reality, Big Data and hyper-automation, is what has enabled the development of Computer Vision. With the application of its methods, it is nowadays possible, for example, to discover faults during production, as well as to discriminately identify defective results. Thanks to the versatility of its complex algorithm systems, it is plausible to employ its uses in a multitude of industries and processes: electronics (code reading), packaging (labeling or print verification), logistics (hazardous material detection), automotive (quality control) or health (reading and verification of packaging or x-rays), etc.

The fact that this is a sector with a future full of opportunities and possibilities is what has led TECH to develop this Hybrid Professional Master's Degree in Computer Vision. This is an intensive and exhaustive program that will provide the graduate with a broad and specialized knowledge of this science, its techniques and current applications. Through 1,500 hours of the best theoretical and practical training, the computer scientist will get to know in detail the ins and outs of intelligent systems, being able to develop a project by himself with total guarantee of success.

This program includes not only a complete and specialized syllabus, designed exclusively by engineers versed in this sector, but also additional material presented in different formats to allow you to delve into each section in a personalized way. All this, through the Online Classroom, which you can access from any device with an Internet connection and with an online schedule totally adapted to your availability. Finally, you will be able to complete 120 hours of practical training in a reference center, which will allow you to improve your skills through active participation in IT projects and give your resume a prestigious label that will make you stand out in any personnel selection process.

This **Hybrid Professional Master's Degree in Computer Vision** contains the most complete and up-to-date educational program on the market. The most important features include:

- Development of more than 100 cases presented by IT professionals who are experts in project management, software analysis and design, and programming of quality control applications, customer and supplier management
- Its graphic, schematic and eminently practical contents are designed to provide up-to-date and advanced information on Artificial Intelligence and Computer Vision
- Integral management of images to be exported, content and data analysis based on Computer Vision systems, work with Cloud Computing platforms as usual
- Thorough understanding of the handling of augmented reality devices, as well as control of the most common 3D image processing software
- All this will be complemented with theoretical lessons, questions to the expert, discussion forums on controversial issues and individual reflection work
- Content that is accessible from any fixed or portable device with an Internet connection
- In addition, you will be able to do an internship in one of the best IT companies in the world

A complete program that combines the best theory 100% online and guaranteed practice in 12 months of specialized training"

You will have hundreds of hours of high quality additional material presented in different formats, so that you can delve into each section in a personalized way during the theoretical period"

A program specialized in 3D image processing with which you can learn in detail the most effective registration and Meshing strategies available today.

You will acquire the advanced digital image processing skills of an expert in the sector.

In this Hybrid Professional Master's Degree proposal, of a professional nature and blended learning modality, the program is aimed at updating IT professionals who develop their functions in the engineering sector specialized in Artificial Intelligence, and who require a high level of qualification. The contents are based on the latest evidence in the sector, and are oriented in a didactic way to integrate theoretical knowledge into IT practice, and the theoretical-practical elements will facilitate the updating of knowledge and will allow decision making in project management and direction.

Thanks to its multimedia content developed with the latest educational technology, they will allow the specialist to enjoy situated and contextual learning, i.e. a simulated environment that will provide immersive training programmed to train in real situations. This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise throughout the program. For this purpose, students will be assisted by an innovative interactive video system created by renowned and experienced experts.

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Why Study this Hybrid Professional Master's Degree?

In disciplines such as Computer Vision, it is essential to have the most up-to-date knowledge and skills to be able to respond to the current challenges of the sector. Because of this, this area is in constant transformation, so it is necessary for the professional to be updated in a real working environment. And TECH offers you the opportunity to do so through this program, which combines the most advanced theoretical content with a practical stay in a prestigious technology company, enabling a complete update of the student in Machine Learning, Deep Learning and image processing, among many other issues.

This program will allow you to enter a real professional environment where you will learn firsthand the main techniques and applications of Computer Vision, accompanied by leading specialists in this technology sector"

1. Updating from the latest technology available

TECH allows the professional, through this program with a practical orientation, to get up to date with the latest advances in Computer Vision in an innovative work environment. Because of this, it will bring you closer to technological spaces where you will have the most advanced equipment and devices in this sector, which will guarantee an effective learning in this complex discipline.

2. Deepen your knowledge from the experience of top experts

To know the ins and outs of Computer Vision, it is necessary to access the knowledge that experts in the field can provide. For this reason, TECH offers students the possibility of spending their time in a prestigious company in the technological field, where they will be accompanied by the best experts in the sector, so that they can learn the most important procedures in Machine Learning or Deep Learning directly from experienced specialists.

3. Entering first-class professional environments

TECH carefully selects all available centers for Internship Programs. Thanks to this, the specialist will have guaranteed access to a prestigious technological environment in the area of Computer Vision. In this way, you will be able to see the day-to-day work of a demanding, rigorous and exhaustive area, always applying the latest theses and scientific postulates in its work methodology.

4. Combining the Best Theory with State-of-the-Art Practice

This Hybrid Professional Master's Degree combines, in a single curriculum, the latest theoretical advances in Computer Vision with an intensive internship in a prestigious center in this sector. In this way, through this program, the student will be able, first, to be updated on the latest developments in the discipline and, later, to put them into practice in a 100% real business environment, where they will be able to carry out various professional activities over a period of 3 weeks.

5. Expanding the Boundaries of Knowledge

TECH offers the possibility of doing this Internship Program, not only in national, but also in international centers. In this way, students will be able to expand their frontiers and catch up with the best professionals, who work in first class companies and in different continents. A unique opportunity that only TECH, the largest online university in the world, could offer.

You will have full hands-on immersion at the center of your choice"

03

Objectives

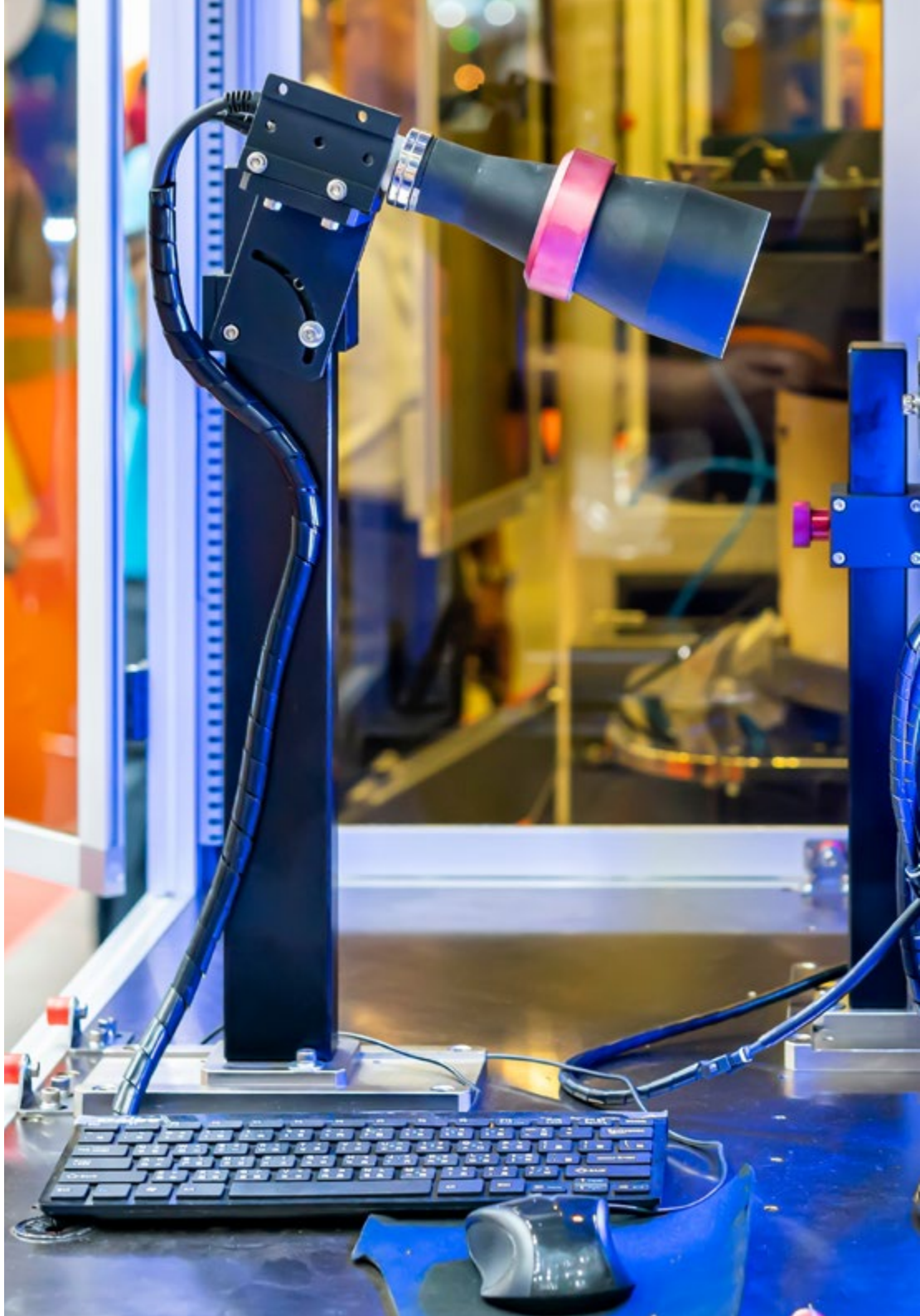
Given the high demand and the exhaustive complexity required to master everything related to Computer Vision, the objective of this program is to provide the graduate with the academic tools that will allow them, both during the theoretical part and during the practical stay, to broaden their skills in a specialized manner. To this end, TECH has developed a strategy that will help the computer scientist to advance their knowledge of the techniques, programs and activities that make up this scientific discipline, guaranteeing that they will exceed their expectations in less time than he expects.

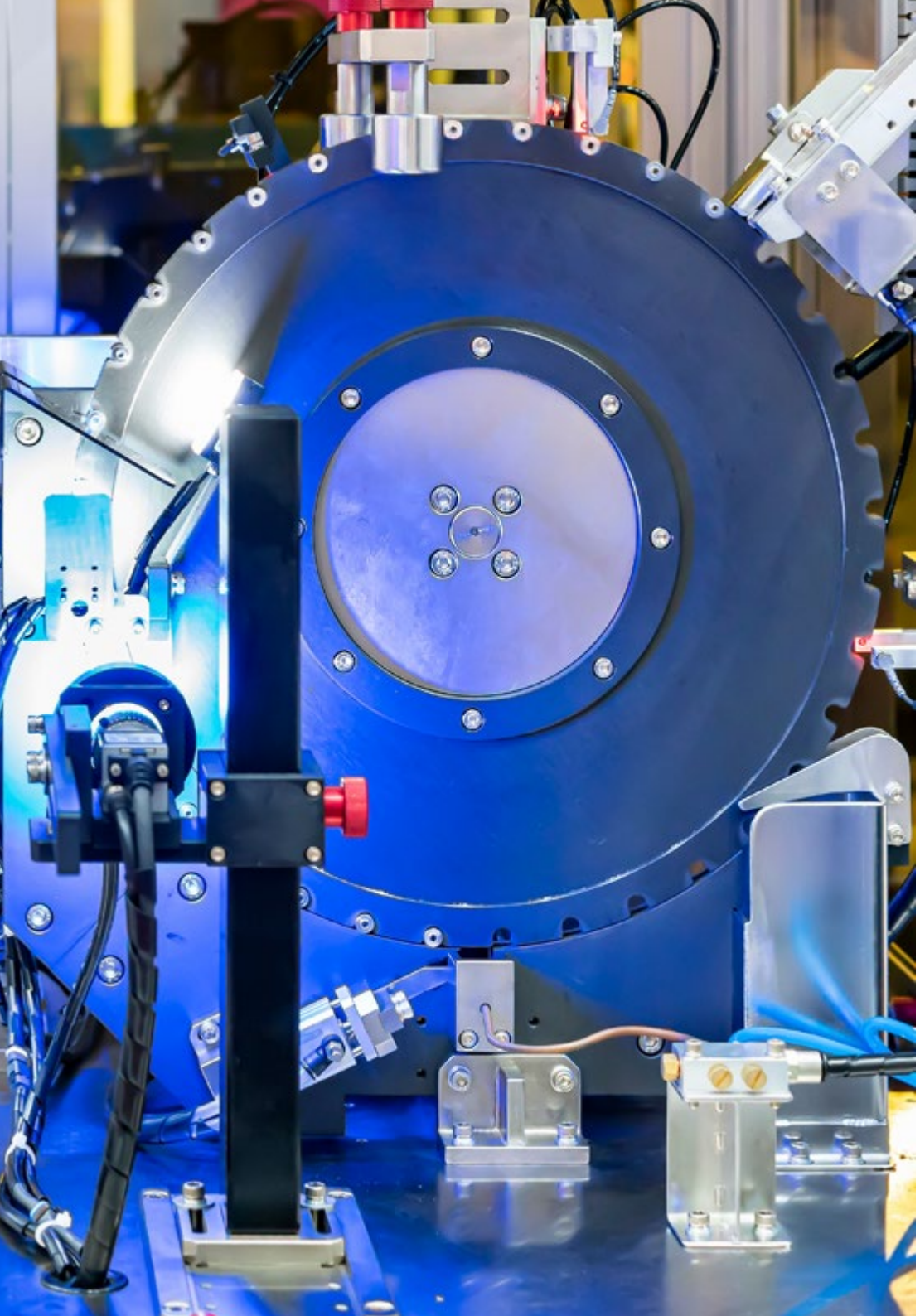
You will be able to practice Transfer Learning, Fine Tuning and Data Augmentation in Deep Learning and include it in your professional skills portfolio"

General Objective

- This Hybrid Professional Master's Degree has been developed with the objective that the graduate can obtain a global vision of the devices and hardware used in the world of Computer Vision through an exhaustive analysis of the different fields in which these techniques are applied. In addition, by using the most cutting-edge methodology in the university sector, you will be able to hone your skills in the evaluation of fundamental and advanced strategies for image processing and presentation of open 3D libraries. Finally, the computer scientist will gain specialized knowledge about the current state of Computer Vision and what the future holds in the coming years

TECH's goal with programs like this is to train the benchmark computer scientists of the future in a comprehensive and intensive manner"





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
- Specify what optical systems exist and evaluate their use
- Examine 3D vision systems and how these systems provide depth to images
- Develop the different existing systems outside the field visible to the human eye

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
- Analyze the use of vision in commercial applications
- Determine how robots have eyes through machine vision and how it is applied in space travel
- Establish what augmented reality is and fields of use
- Analyze the Cloud Computing revolution
- Present the state of the art and what the next few years have in store

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
- Present tools to modify images pixel by pixel
- Propose image segmentation tools
- Analyze morphological operations and their applications
- Determine the methodology in image calibration
- Evaluate methods for segmenting images with conventional vision

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
- Analyze mathematical techniques for geometry analysis
- Evaluate different options in image compositing
- Develop user interface

Module 5. 3D Image Processing

- Examine a 3D image
- Analyze the software used for 3D data processing
- Develop Open 3D
- Determine the relevant data in a 3D image
- Demonstrate visualization tools
- Establish denoising filters
- Propose Geometric Calculation tools
- Analyze object detection methodologies
- Evaluate triangulation and scene reconstruction methods

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
- Fundamentals of cost functions
- Establish the most important activation functions
- Examine regularization and normalization techniques
- Develop optimization methods
- Introduce initialization methods

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
- Compile inference methods

Module 8. Object Detection

- Analyze how object detection networks work
- Examine traditional methods
- Determine evaluation metrics
- Identify the main Datasets used in the market
- Propose architectures of the Two Stage Object Detector type
- Analyze Fine Tuning Methods
- Examine different Single Shoot architectures
- Establish object tracking algorithms
- Apply detection and tracking of people

Module 9. Image segmentation with Deep Learning

- Analyze how semantic segmentation networks work
- Evaluate traditional methods
- Examine evaluation metrics and different architectures
- Examine video domains and cloud points
- 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
- Develop Adversarial Generative Networks

04

Skills

During the course of this Hybrid Professional Master's Degree in Computer Vision, the graduate will work on perfecting their professional skills and abilities through specialized knowledge of tools and strategies. Thanks to this, you will be able to expand your skills catalog and include in your resume a series of professional skills that will help you stand out in any personnel selection process, allowing you to apply for prestigious jobs in large companies in the IT sector.

Investing in a program that guarantees the acquisition of the skills of a true professional in the field of Computer Vision is a guaranteed bet on the future"

General Skills

- Understand how the real world is being digitized according to the different existing technologies
- Develop the systems that are changing the world of vision and its functionalities
- Master the acquisition techniques to obtain the optimal image
- Know the different digital image processing libraries available in the market
- Develop tools that combine different computer vision techniques
- Establish problem analysis rules
- Demonstrate how functional solutions can be created to address industrial, commercial, etc. problems

Enroll now and advance in your field of work with a comprehensive program that will allow you to put into practice everything you have learned"

Specific Skills

- Determine how a 3D image is formed and its characteristics
- Establish methods for the processing of 3D images
- Understand the mathematics behind neural networks
- Propose inference methods
- Generate specialized knowledge on object detection neural networks and their metrics
- Identify the different architectures
- Examine tracking algorithms and their metrics
- Identify the most common architectures
- Apply correct cost function for learning
- Analyze public data sources (Datasets)
- Examine different labeling tools
- Develop the main phases of a segmentation-based project
- Examine filtering algorithms, morphology, pixel modification, etc
- Generate specialized knowledge about Deep Learning
- Develop convolutional neural networks

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Course Management

One of the hallmarks of TECH's quality is the choice of a teaching team for its programs that is well versed in the area in which each program is developed. That is why, for the management and direction of the theoretical part of this Hybrid Professional Master's Degree, a group of professionals specialized in Computer Engineering and Telecommunications has been formed with a wide and extensive work experience in the management and direction of projects related to the different applications of Computer Vision.

You will have a teaching team specialized in Computer and Telecommunication Engineering to solve any doubts you may have"

Management

Mr. Sergio Redondo Cabanillas

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

Professors

Mr. José Ángel Gutiérrez Olabarría

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

Mr. Jordi Enrich Llopart

- Bcnvision's Chief Technology Officer - Machine vision
- Project and application engineer. Bcnvision - Machine vision
- Project and application engineer. PICVISA Machine Vision
- Graduated 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 - Universitat Ramon

Mr. Antoni Bigata Casademunt

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

Mr. Àlex Solé Gómez

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

Ms. Meritxell Riera i Marín

- Deep Learning Systems Developer in 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
- Telecommunications Engineering from Universidad Politécnica de Catalonia
- *Master of Science: Spécialité Signal, image, systèmes embarqués, automatique* (SISEA) at IMT Atlantique, France
- Master's Degree in Telecommunications Engineering and Engineering from the Polytechnic University of Catalonia

Mr. Diego Pedro González González

- 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 (Spain)
- Industrial Engineer by Miguel Hernández University

Mr. Felipe Higón Martínez

- Electronics, Telecommunications and Computer Science 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

Ms. Clara García Moll

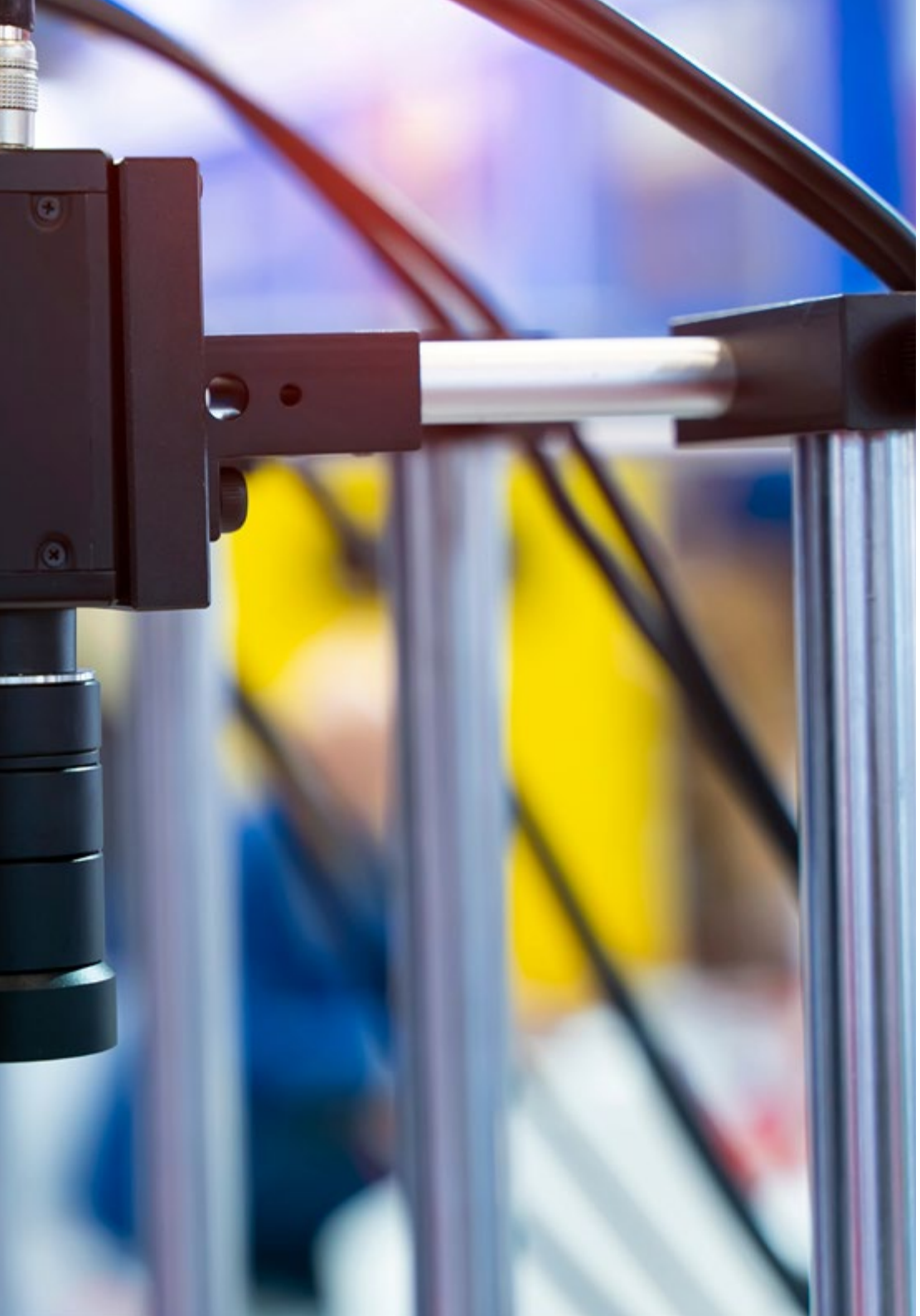
- Junior Visual Computer Engineer at LabLENI
- Computer Vision Engineer. Satellogic
- Full Stack Developer. Catfons Group
- Audiovisual Systems Engineering. Pompeu Fabra University (Barcelona)
- Master's Degree in Computer Vision. Autonomous University of Barcelona

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 Universitat Politècnica de Catalunya
- MSc in Computer Vision at Universitat Autónoma de Barcelona
- Graduate in Computer Science at Aalto University
- Graduate in Audiovisual Systems. UPC - ETSETB Telecoms BCN

Mr. Alejandro Olivo García

- *Vision Application Engineer* in Bcnvision
- Degree in Industrial Technologies Engineering from the School of Industrial Engineering Universidad Politécnica de Cartagena (UPCT)
- Master's Degree in Industrial Engineering from the School of Industrial Engineering, UPCT
- MTorres Research Chair Grant
- C# .NET Programming in Machine Vision Applications



Boost your career path with holistic teaching, allowing you to advance both theoretically and practically"

06

Educational Plan

For the development of the curriculum of this 100% online program, TECH has taken into consideration the criteria of the teaching team, which, following the strict quality parameters required by this center, have selected the most updated and comprehensive information based on Computer Vision. Thanks to this, to the use of the Relearning pedagogical methodology and to the selection of the best additional material presented in different formats, it has been possible to elaborate a dynamic, innovative and highly training program. Just what the student needs to master, in just 12 months, this scientific discipline.

Performing a correct segmentation of advanced images using different frameworks tools will seem an easy task to perform after passing this program"

Module 1. Computer Vision

1.1. Human Perception
- 1.1.1. Human Visual System
- 1.1.2. 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 Artificial Vision Due to COVID 19
- 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

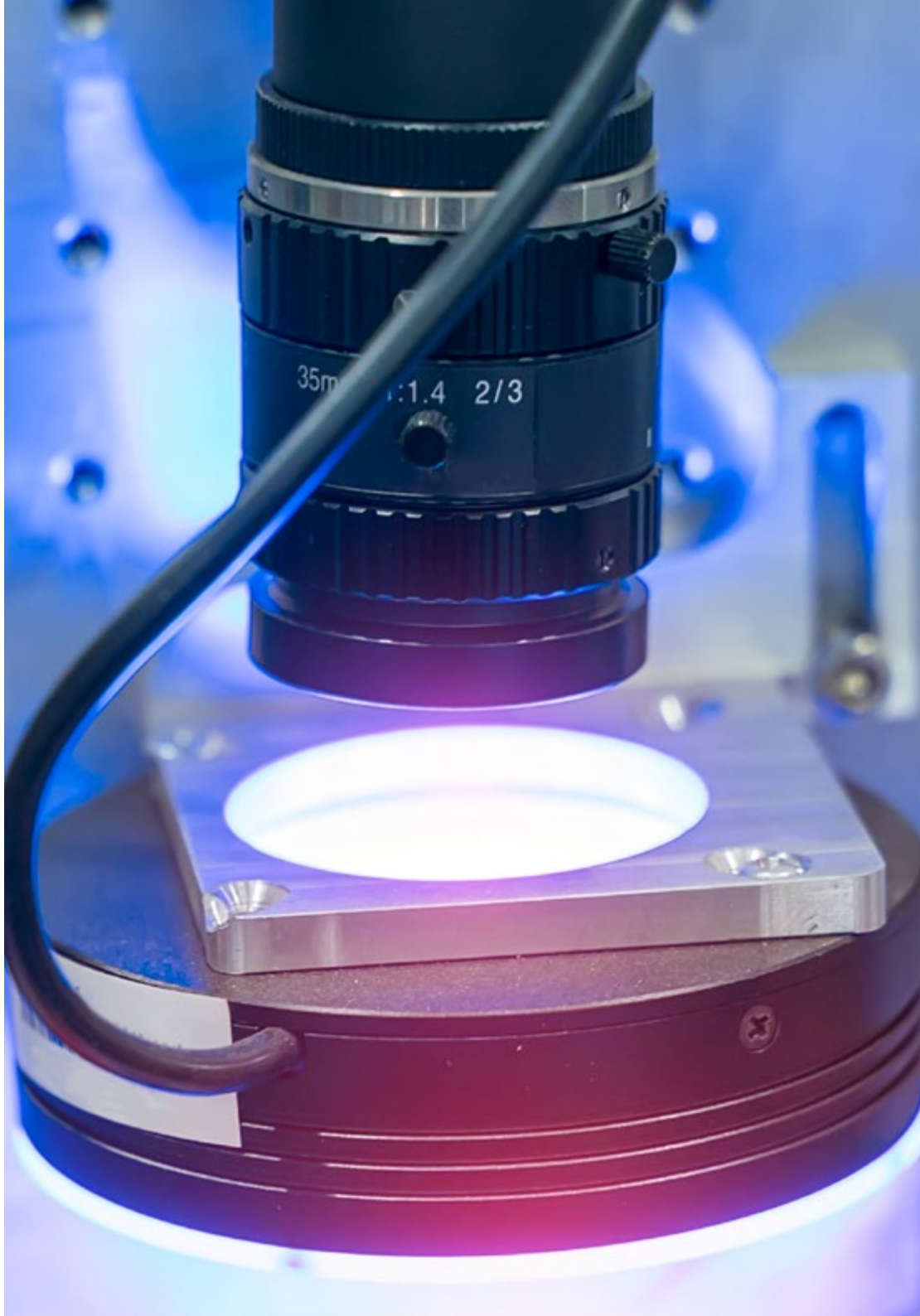
3.2. Digital image Processing
- 3.2.1. Pixel Relationships
- 3.2.2. Image Operations
- 3.2.3. Geometric Transformations

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. Features
- 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. Features 3D

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 PointClouds

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 Perceptron
- 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 Learning 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. Case Study: 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. Case Uses
- 8.1.3. Object Tracking
- 8.1.4. Case Uses
- 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 Suppression (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: Detection and Tracking of Individuals
- 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: RCNN Mask
- 9.8.1. RCNN Mask
- 9.8.2. Architecture
- 9.8.3. Application of a RCNN Mask

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 Applications

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. Others

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. Assessment

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

07

Clinical Internship

Once the 1,500 hours of theoretical training have been completed, the graduate will have the opportunity to take a 3-week practical internship in a leading international company in the IT sector. This is a unique opportunity to work side by side with professionals in the sector and to actively participate in the Machine Vision projects that are being developed in the company during this period. In this way, the student will be able to perfect their skills in a protagonist and guaranteed way.

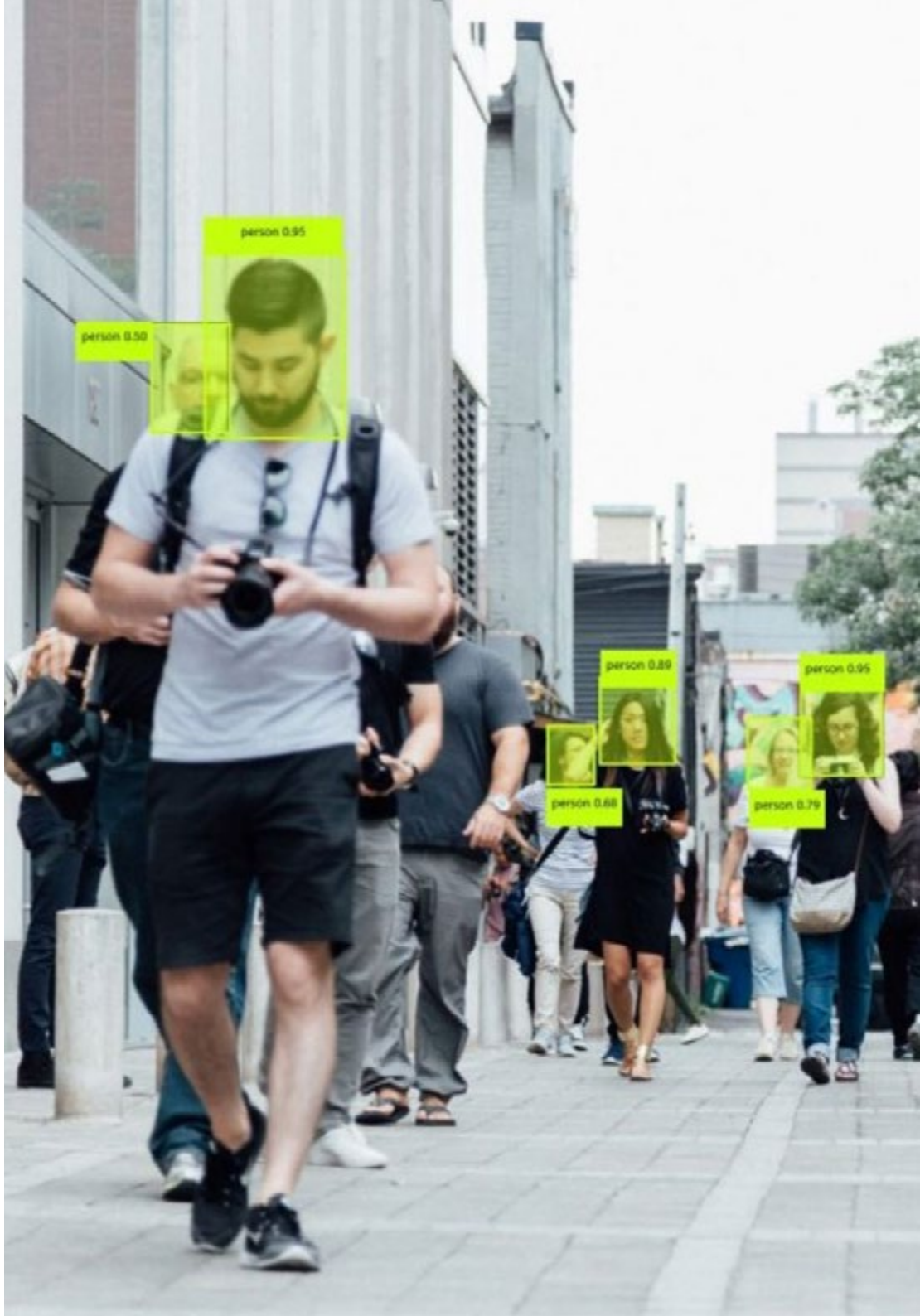
TECH guarantees you a 3-week internship in a benchmark company in the IT industry, to be included in your resume as a distinctive asset"

The creation of this eminently practical part of the program has been motivated by the high demand that currently exists for computer professionals who master the tools and techniques of Computer Vision. It consists of 120 hours distributed over 3 weeks, during which the graduate will have access to a prestigious international company, from Monday to Friday and during a full 8-hour working day. In addition, you will be accompanied by a specialized tutor who will not only watch over your learning, but will also provide you with everything you need so that you can obtain the greatest possible benefit from this experience for your development as a Machine Learning specialist.

In this completely practical proposal, the activities are aimed at the development and improvement of the necessary skills for the management of projects related to Computer Vision and image processing in its different formats and representations, and are oriented to the specific training for the exercise of the work activity with a high professional performance.

It is, therefore, a unique opportunity to add experience in a prestigious company to your resume and to demonstrate that you are capable of managing projects related to the use of this technology. During the 3 weeks you will actively participate in the tasks being developed in the company, being able to learn from specialists the best techniques and professional strategies on the current application of Computer Vision.

The practical teaching will be carried out with the participation of the student performing the activities and procedures of each area of competence (learning to learn and learning to do), with the accompaniment and guidance of teachers and other training partners to facilitate teamwork and multidisciplinary integration as cross-cutting skills for the practice of computer science applied to Computer Vision (learning to be and learning to relate).



The procedures described below will be the basis of the practical part of the training, and their implementation will be subject to the center's own availability and workload, the proposed activities being the following:

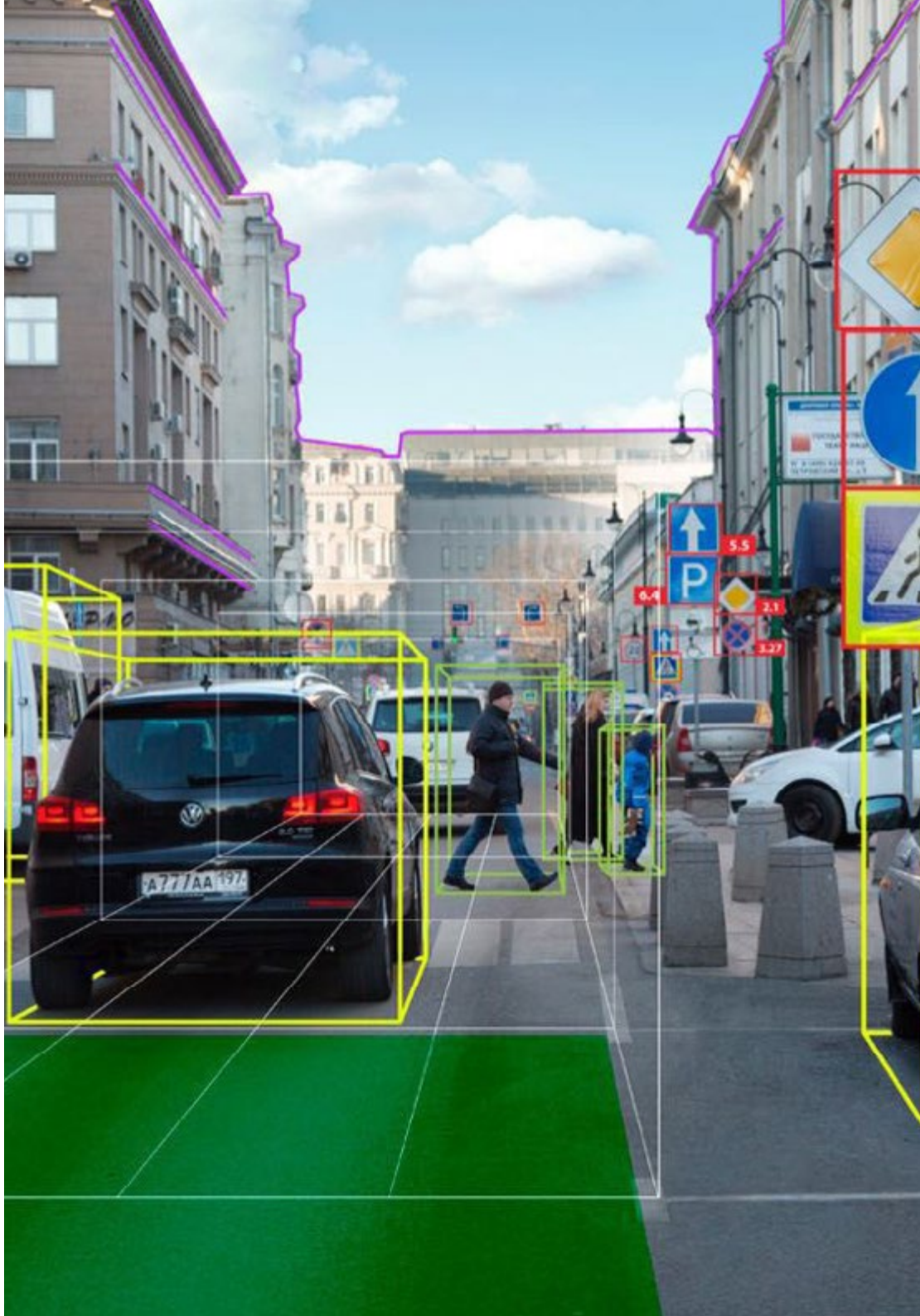
Module	Practical Activity
Digital Image Processing Techniques in Computer Vision	Adjust and apply the correct exposure, depth of field, resolution and image formats to be exported from an image capture tool
	Perform advanced image processing by applying filters, pixel operations and morphological operations
	Calibrate images to improve post-processing accuracy
	Program advanced image processing with facial recognition or pattern matching applications
	Enhance image contouring using HDR and Photometric Stereo techniques
	Perform processing of surfaces, 3D objects and depth map triangulation
Methods of application of Deep Learning in Computer Vision	Use the most common frameworks and hardware in the implementation of Deep Learning processes
	Perform neural network evaluation metrics, based on Accuracy, Dice Coefficient, ROC Curve (AUC) or Cross-Validation criteria
	Practice Transfer Learning, Fine Tuning and Data Augmentation in Deep Learning
	Prepare data and validation models for proper classification of images useful in computer vision
Image detection and segmentation techniques	Employ specific object detection and tracking Datasets
	Deploy an object detection architecture focused on computer vision
	Segment the images received through different Deep Learning systems
	Apply segmentation in videos and point clouds
	Perform advanced image segmentation using different tools and frameworks
	Carry out a semantic segmentation project, differentiating the different phases of the project

Civil Liability Insurance

This institution's main concern is to guarantee the safety of the trainees and other collaborating agents involved in the internship process at the company. Among the measures dedicated to achieving this is the response to any incident that may occur during the entire teaching-learning process.

To this end, this educational entity undertakes to take out civil liability insurance to cover any eventuality that may arise during the stay at the internship center.

This liability policy for interns will have broad coverage and will be taken out prior to the start of the practical training period. In this way, the professional will not have to worry in case they have to face an unexpected situation and will be covered until the end of the practical program at the center.



General Conditions for Practical Training

The general terms and conditions of the internship program agreement shall be as follows:

1. TUTOR: During the Hybrid Professional Master's Degree, students will be assigned with two tutors who will accompany them throughout the process, answering any doubts and questions that may arise. On the one hand, there will be a professional tutor belonging to the internship center who will have the purpose of guiding and supporting the student at all times. On the other hand, they will also be assigned with an academic tutor whose mission will be to coordinate and help the students during the whole process, solving doubts and facilitating everything they may need. In this way, the student will be accompanied and will be able to discuss any doubts that may arise, both clinical and academic.

2. DURATION: The internship program will have a duration of three continuous weeks, in 8-hour days, 5 days a week. The days of attendance and the schedule will be the responsibility of the center and the professional will be informed well in advance so that they can make the appropriate arrangements.

3. ABSENCE: If the students does not show up on the start date of the Hybrid Professional Master's Degree, they will lose the right to it, without the possibility of reimbursement or change of dates. Absence for more than two days from the internship, without justification or a medical reason, will result in the professional's withdrawal from the internship, therefore, automatic termination of the internship. Any problems that may arise during the course of the internship must be urgently reported to the academic tutor.

4. CERTIFICATION: Professionals who pass the Hybrid Professional Master's Degree will receive a certificate accrediting their stay at the center.

5. EMPLOYMENT RELATIONSHIP: the Hybrid Professional Master's Degree shall not constitute an employment relationship of any kind.

6. PRIOR EDUCATION: Some centers may require a certificate of prior education for the Hybrid Professional Master's Degree. In these cases, it will be necessary to submit it to the TECH internship department so that the assignment of the chosen center can be confirmed.

7. DOES NOT INCLUDE: The Hybrid Professional Master's Degree will not include any element not described in the present conditions. Therefore, it does not include accommodation, transportation to the city where the internship takes place, visas or any other items not listed.

However, students may consult with their academic tutor for any questions or recommendations in this regard. The academic tutor will provide the student with all the necessary information to facilitate the procedures in any case.

08

Where can I do the Clinical Internship?

In order to guarantee a stay that the graduate can make the most of and that can serve as a reference for their future career, TECH selects for its internships only centers that can guarantee that the professional will be able to actively participate in their day-to-day work. In this way, the center offers an immersive experience with which you will be able to perfect your professional skills through the on-site handling of the most sophisticated tools in the sector and accompanied by a team of specialists with extensive experience in the management and direction of Computer Vision projects.

You will be able to actively participate in the Computer Vision projects that are being carried out in the company during the internship period"

The student will be able to take the practical part of this Hybrid Professional Master's Degree in the following centers:

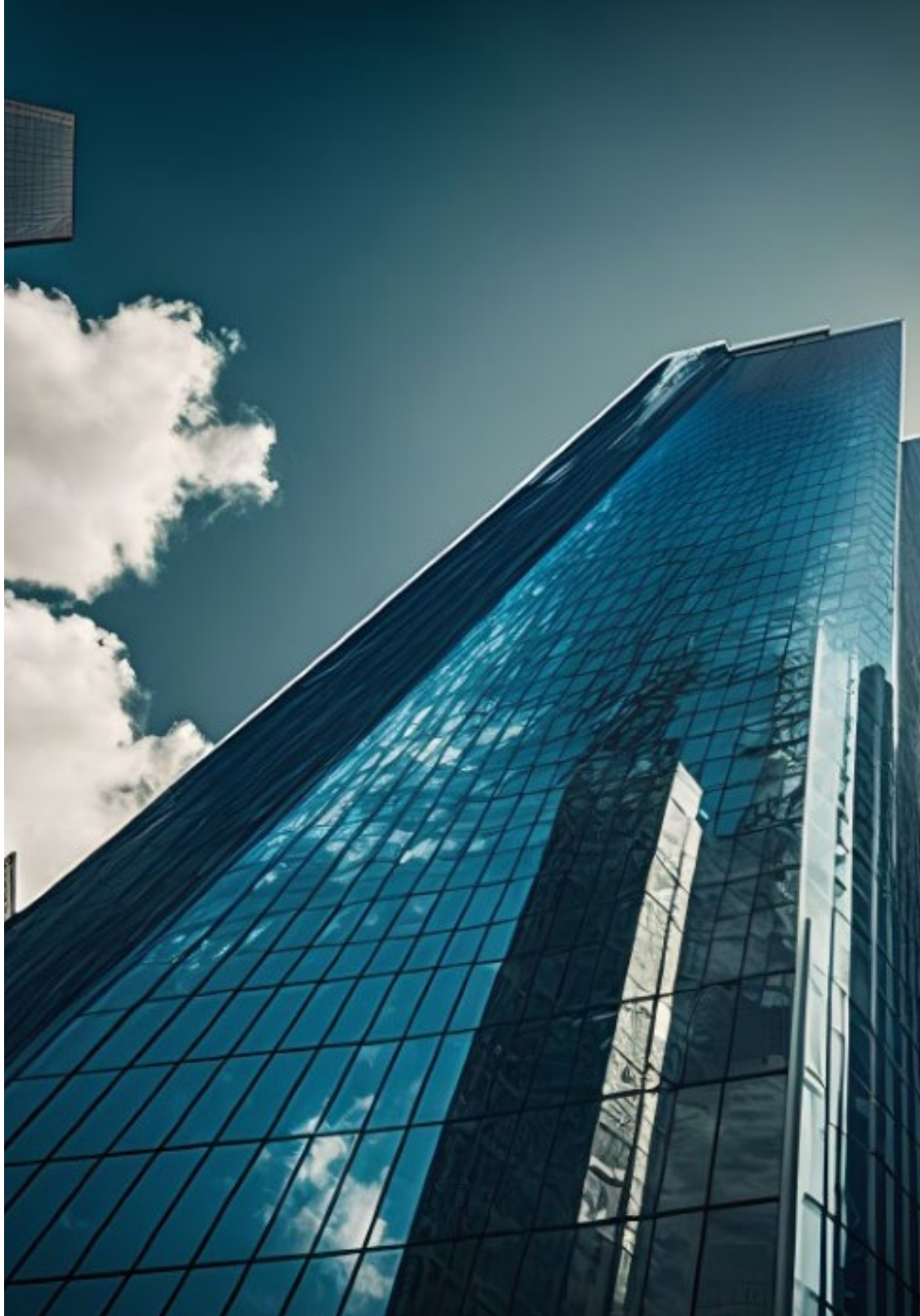
Web Experto

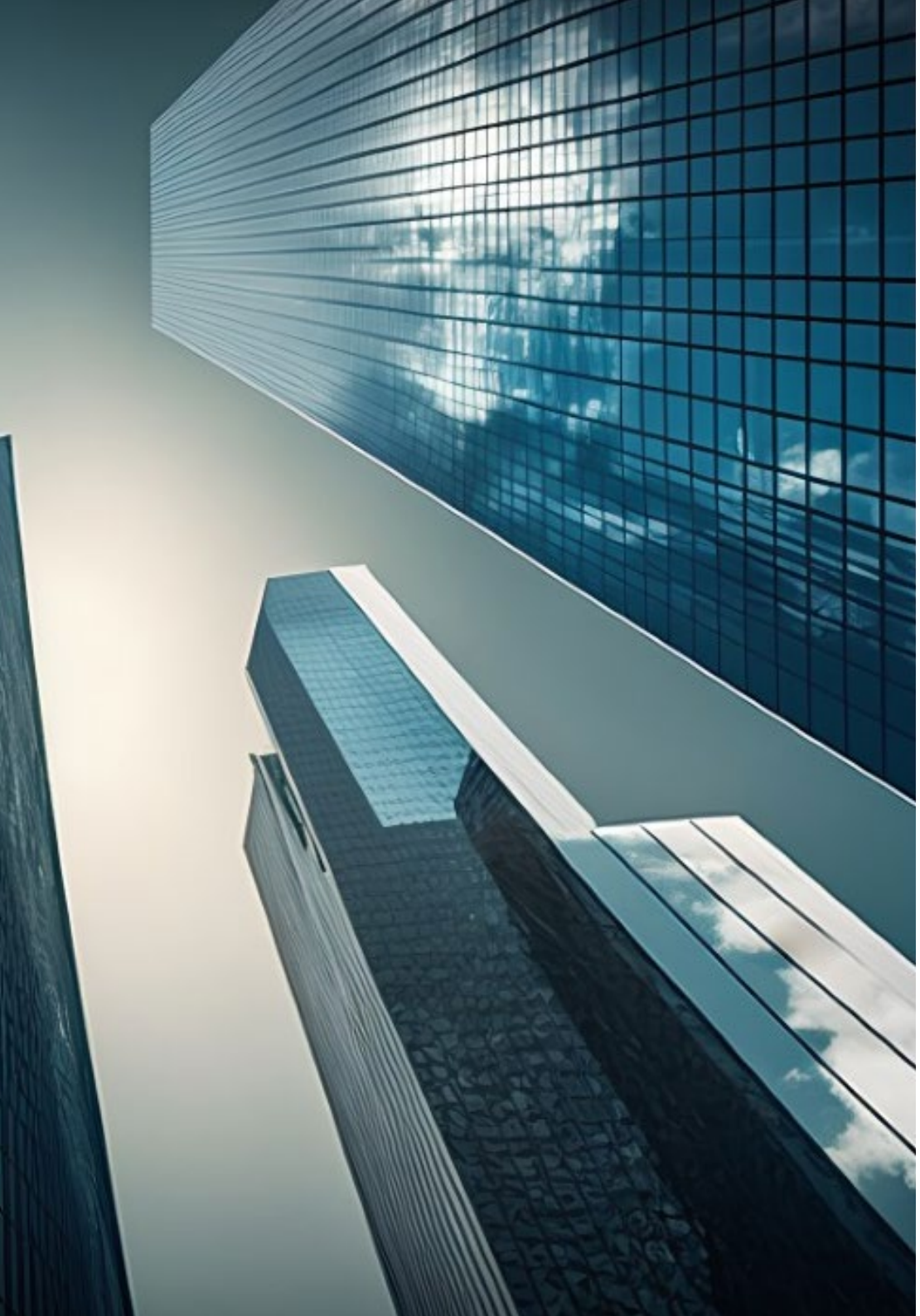
Country	City
Argentina	Santa Fe

Address: Lamadrid 470 Nave 1 1º piso Oficina 17, Rosario, Santa Fe

Digital management and web orientation company

Related internship programs:
- Sales and Marketing Management
· MBA in Digital Marketing





Enroll now and advance in your field of work with a comprehensive program that will allow you to put into practice everything you have learned"

09

Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world"

You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.

The student will learn to solve complex situations in real business environments through collaborative activities and real cases.

A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

> *Our program prepares you to face new challenges in uncertain environments and achieve success in your career"*

The case method has been the most widely used learning system among the world's leading Information Technology schools for as long as they have existed. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the course, students will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

Relearning Methodology

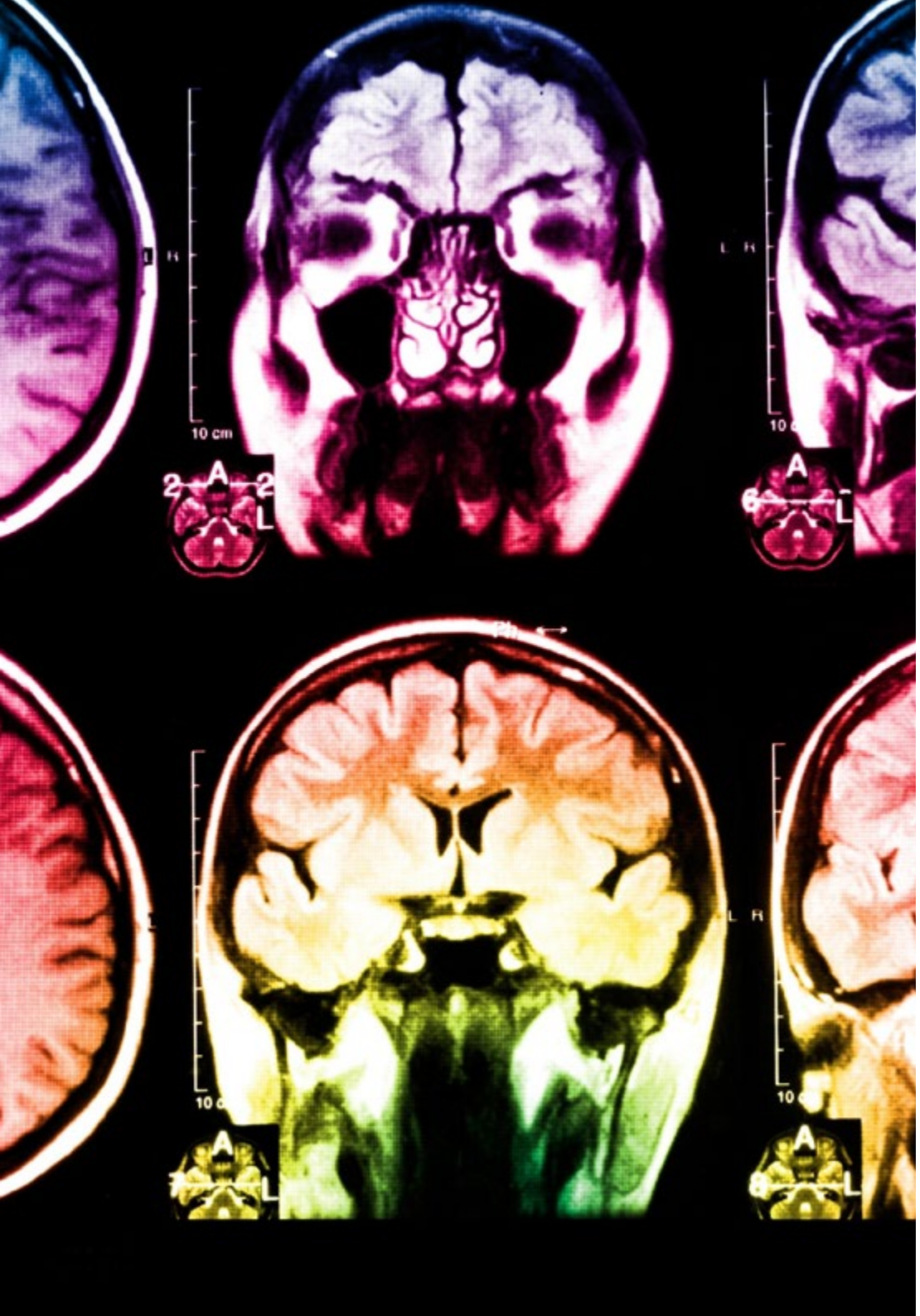
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

In 2019, we obtained the best learning results of all online universities in the world.

At TECH you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.



In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically. This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

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

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.

This program offers the best educational material, prepared with professionals in mind:

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.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.

Classes

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

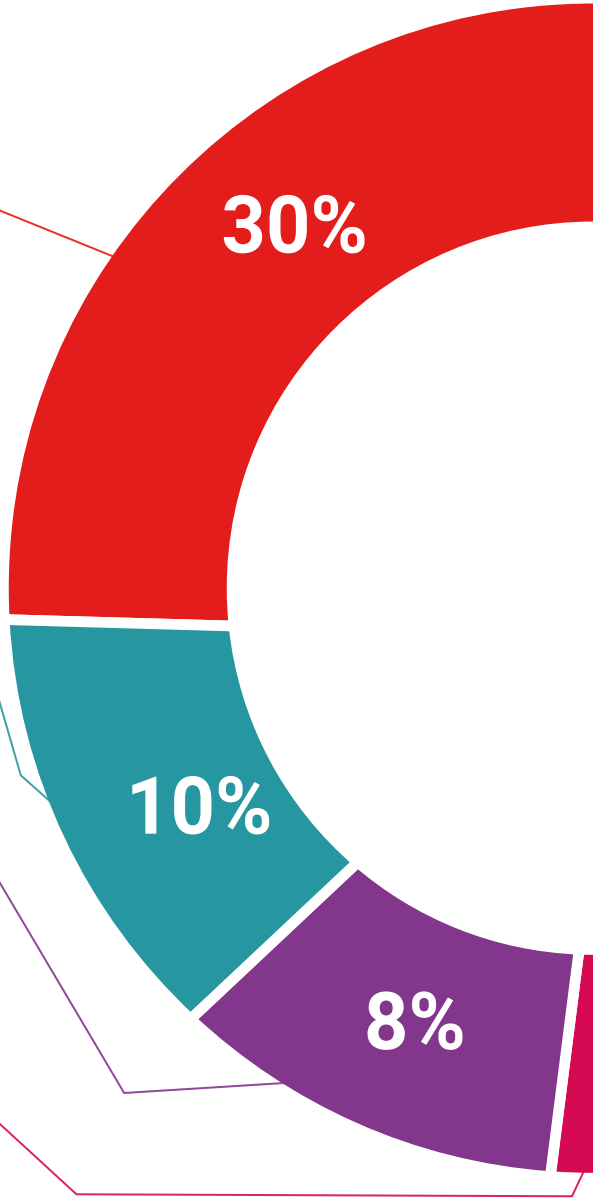
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

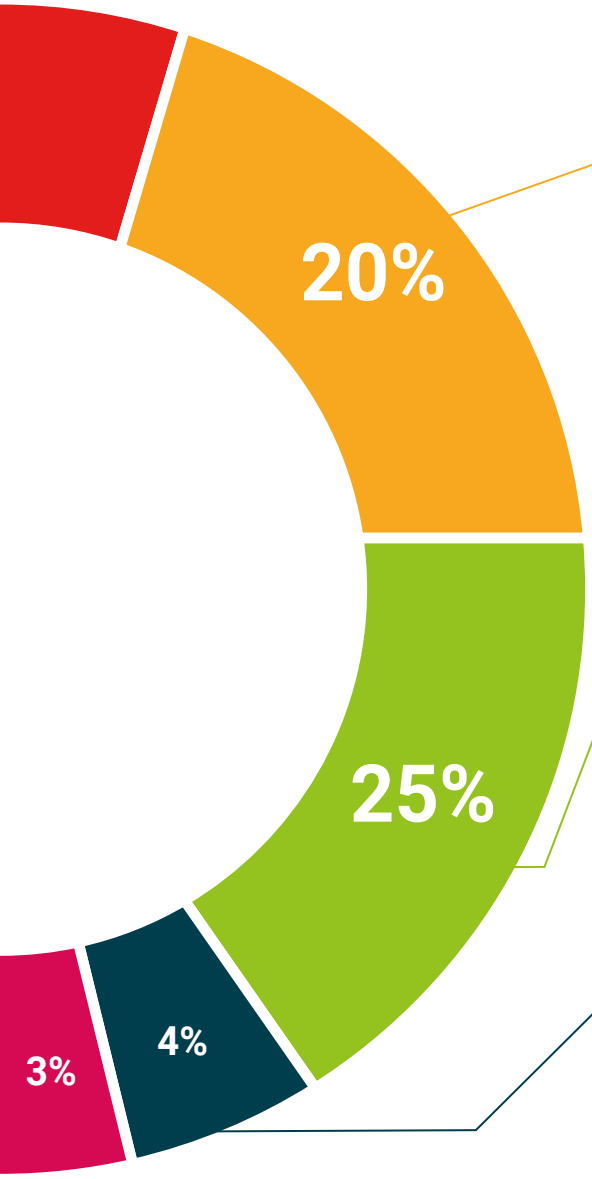
Practising Skills and Abilities

They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.

Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





Case Studies

Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best specialists in the world.

Interactive Summaries

The TECH team presents 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".

Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.

10

Certificate

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

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

This program will allow you to obtain your **Hybrid Professional Master's Degree diploma 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** title 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.

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

Course Modality: **Hybrid (Online + Clinical Internship)**

Duration: **12 months**

Certificate: **TECH Global University**

Recognition: **60 + 5 ECTS Credits**


tech global university

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

Hybrid Professional Master's Degree in Computer Vision

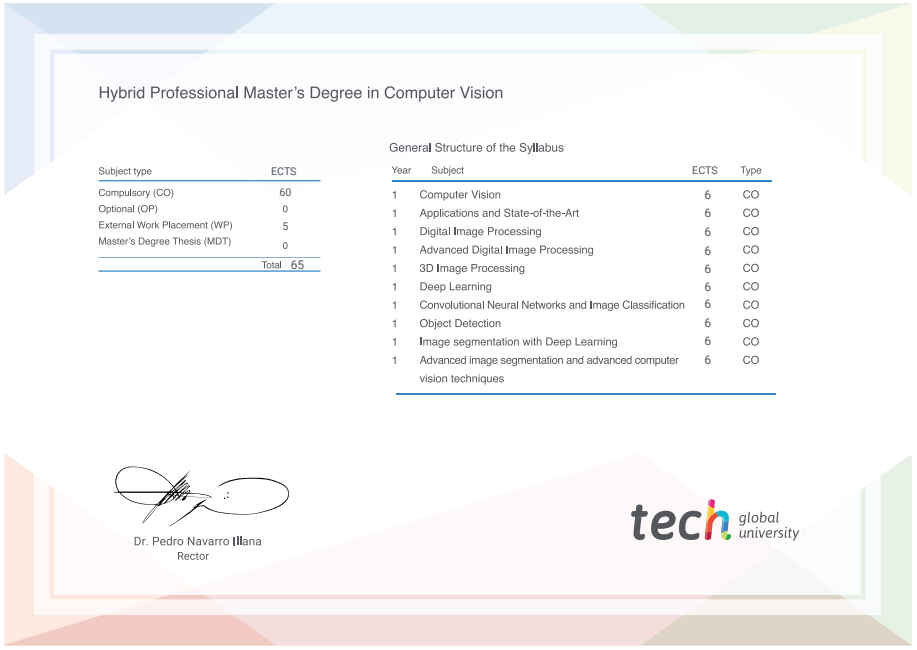
This is a program of 1,620 hours of duration equivalent to 65 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

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
Rector

Unique TECH Code: AFWORD23S techtitute.com/certificates


Hybrid Professional Master's Degree in Computer Vision

Subject type	ECTS
Compulsory (CO)	60
Optional (OP)	0
External Work Placement (WP)	5
Master's Degree Thesis (MDT)	0
Total	65

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
Rector

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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.

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Hybrid Professional Master's Degree

Computer Vision

Modality: **Hybrid (Online + Clinical Internship)**

Duration: **12 months**

Certificate: **TECH Global University**

60 + 5 ECTS Credits

Hybrid Professional Master's Degree
Computer Vision

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