Postgraduate Certificate
Computer Vision

tech technological university

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Postgraduate Certificate
Computer Vision

- Modality: **online**
- Duration: **6 weeks**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

Website: www.techtitute.com/pk/information-technology/postgraduate-certificate/computer-vision

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01

Introduction

Computer Vision technology is very versatile and can be adapted to many industries in many different ways. Many major companies have invested in Computer Vision to personalize their marketing, generate conversions, increase customer satisfaction and safeguard confidential information. The main benefit of this technology is the high accuracy with which it can replace human vision if trained correctly. This fully online training examines how a computer is able to identify an image and each of the steps it takes to do so. In this way, computer scientists will use Computer Vision to assist people to do better jobs, through faster and simpler processes.

Computer Vision has a market that is growing exponentially and is breaking into all types of commercial industries"

Training a model from scratch requires a large amount of previously catalogued information, approximately 10,000 photos of each of the types to be differentiated. This takes hours to achieve good results. But in many cases, it is possible to start from previously trained models, this technique is known as Transfer Learning. This Postgraduate Certificate examines which network models are currently available, in order to facilitate the training of any model by applying the Transfer Learning technique.

In addition, this Certificate will analyze the main case studies that exist for computer vision: classification, object detection, object identification, object tracking. For example, Google uses these algorithms to be able to search from images. Facebook, for example, uses them to automatically identify and tag people in a photo. In addition, graduates will learn about the commercial uses of Computer Vision and where to apply the different models.

To this end, in only 6 weeks will delve into the scope of application of Computer Vision, understanding the competitive advantages they provide, so they will be positioned at the technological forefront and will be able to to lead ambitious projects in the present and in the future. Additionally, The student has the best study methodology 100% online, which eliminates the need to attend classes in person or have to comply with a predetermined schedule.

This **Postgraduate Certificate in Computer Vision.** contains the most complete and up-to-date educational program on the market. Its most notable features are:

- The development of case studies presented by experts in *Computing Vision*
- The graphic, schematic, and practical contents with which they are created, provide 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
- 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

This diploma course delves into the concept of Computer Vision, its importance and its applications in real life"

Computer Vision will be of great use to you because it will allow you to: automate repetitive processes, increase your company's capacity for control and learning, and reduce the time spent on tasks that add little value"

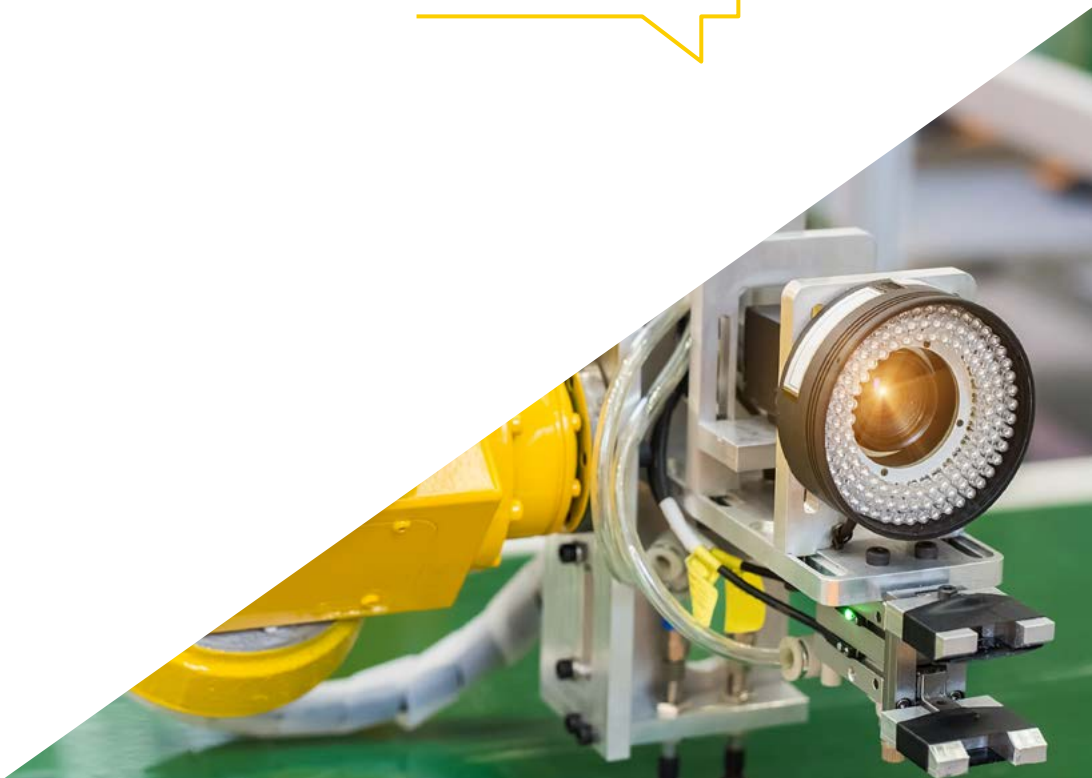
Artificial Intelligence has many branches and applications, but Computer Vision is by far the one that is having the most impact.

In addition, graduates will learn about the commercial uses of Computer Vision and where to apply the different models.

The program's teaching staff includes professionals from the sector who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

Its multimedia content, developed with the latest educational technology, will allow professionals to learn in a contextual and situated learning environment, i.e., a simulated environment that will provide immersive education programmed to prepare in real situations.

The design of this program focuses on Problem-Based Learning, by means of which professionals must try to solve the different professional practice situations that are presented to them throughout the course. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.



02

Objectives

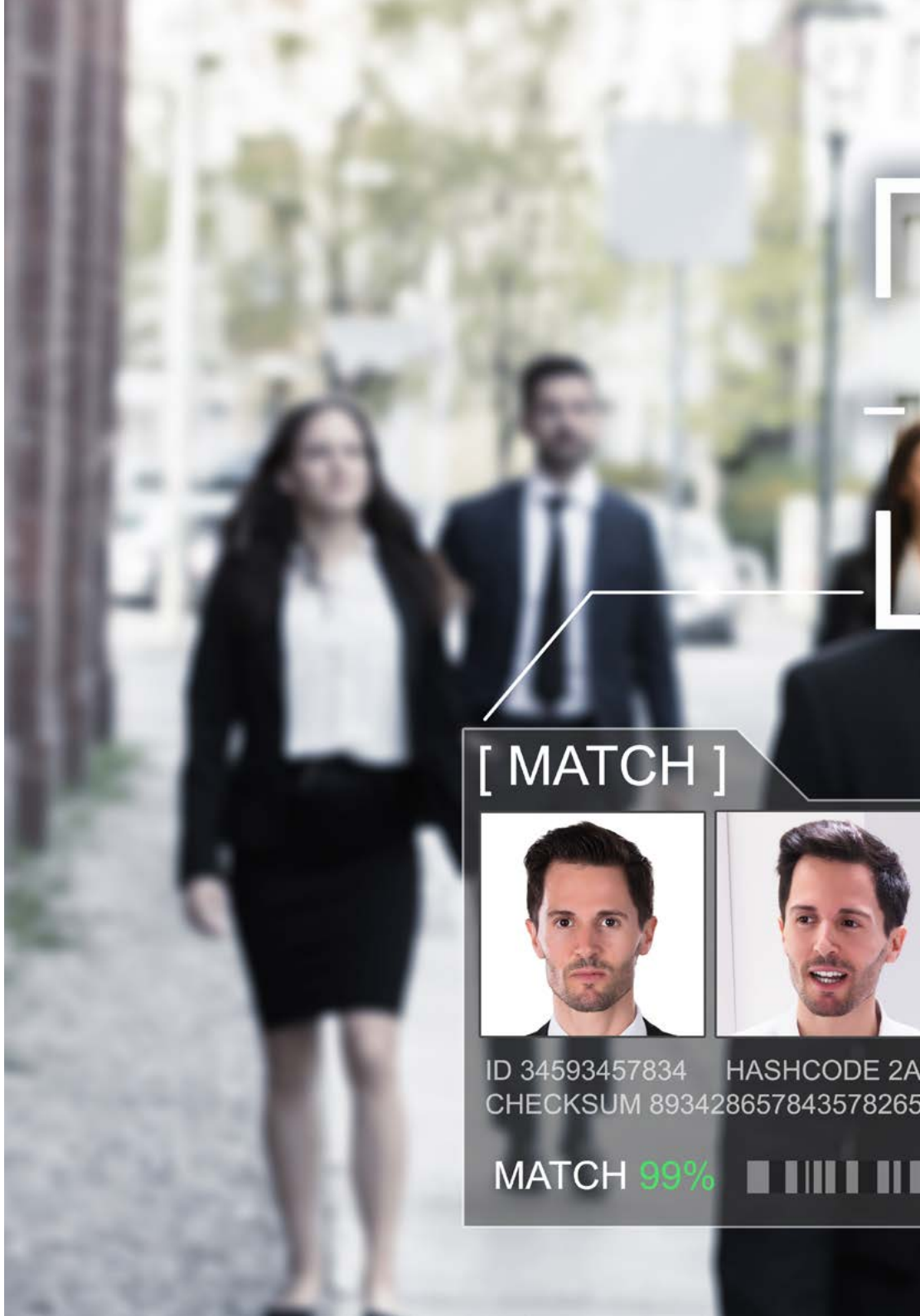
The main objective of this Diploma at the forefront of global digitization is to make a technical immersion in *Computer Vision*, one of the most relevant technologies and that will have greater prominence in technological advances in the coming years. The direct application of the knowledge acquired about this disruptive technology in real projects is an added professional value that very few computer scientists can offer, so the possibilities for professional growth of the students of this degree are immense.

You will acquire the ability to determine how the Convolution layer works and the Transfer Learning technique".

General Objectives

- Analyze how a computer is capable of identifying image
- Determine how the Convolution layer works and how Transfer Learning works.
- Identify the different types of algorithms mainly used in Computer Vision.

This program will generate in you specialized knowledge so that you become a professional catalyst of the technologies of the future"



Specific Objectives

- Analyze what Computer Vision is
- Determine typical computer vision tasks
- Analyze, step by step, how convolution works and how *Transfer Learning* works.
- Identify what mechanisms we have available to create modified images, from our own to have more training data.
- Compile typical tasks that can be performed with computer vision
- Examine commercial computer vision use cases

03

Course Management

Professionals with years of experience in the field computer vision come together in this Professional Master's Degree to teach graduates the newest technologies and areas of study and the most disruptive and surprising practical applications that can be found using this technology. Teachers will present a reality where computers are trained by artificial intelligence models to understand and interpret the visual world.

At TECH you will find the best professionals in Computer Vision, who pour their knowledge to help you"

Management

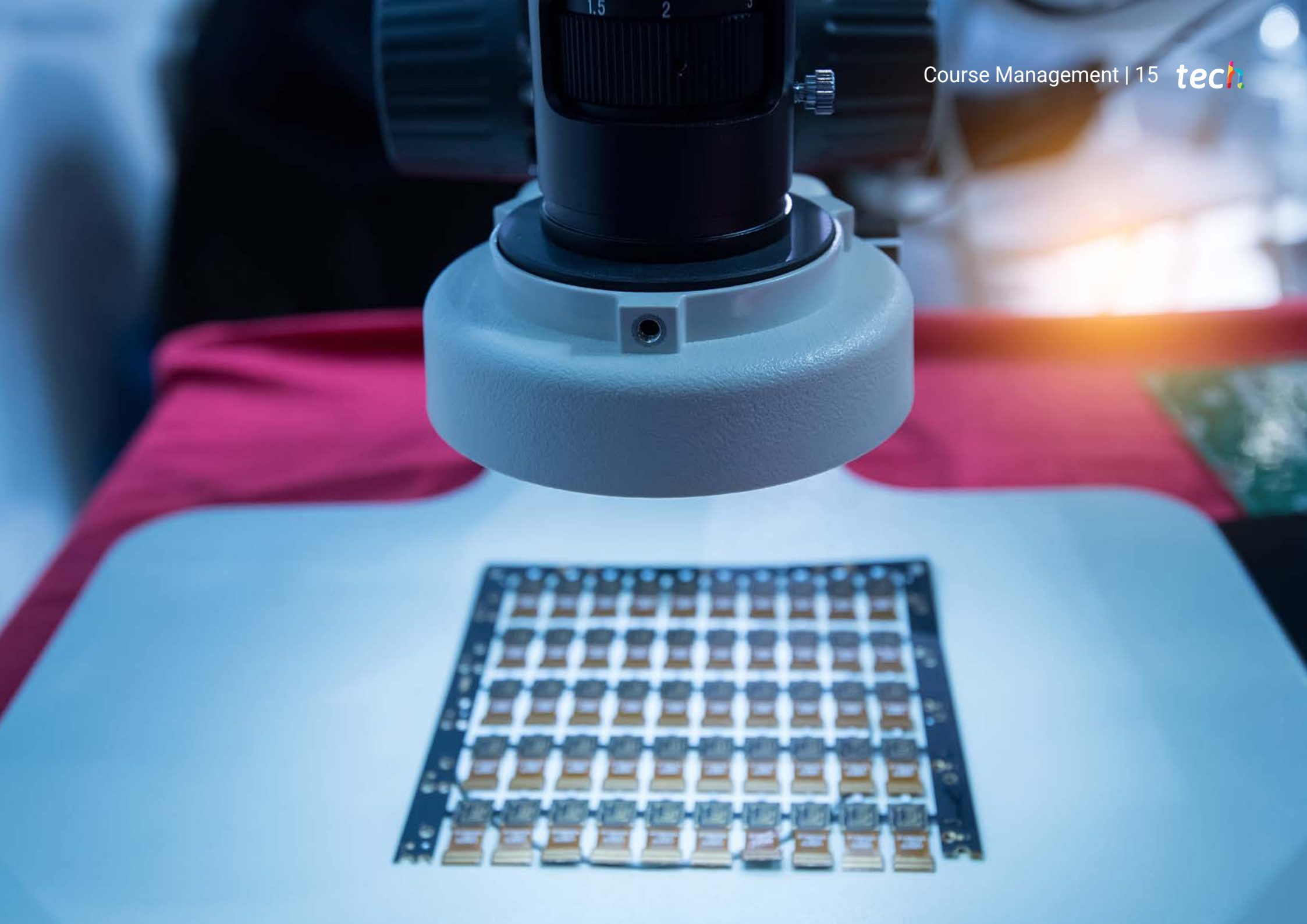
Mr. Molina Molina, Jerónimo

- Head of the Artificial Intelligence Department at Ibermática
- IA Engineer & Software Architect at NASSAT - Internet Satellite in Motion
- Senior Consultant at Hexa Ingenieros. Introducer of Artificial Intelligence (ML and CV).
- Expert in Artificial Intelligence Based Solutions, in the fields of *Computer Vision*, ML/DL and NLP
- Expert in Business Creation and Development at Bancaixa - FUNDEUN Alicante
- Computer Engineer from the University of Alicante
- Master's Degree in Artificial Intelligence from the Catholic University of Avila
- Executive MBA (European Business Campus Forum)

Professors

Mr. Pi Morell, Oriol

- Functional Analyst at Fihoca
- Hosting and Mail Product Owner. CDMON
- Functional Analyst and Software Engineer at Atmira and CapGemini
- Teacher at CapGemini,Forms CapGemina and Atmira
- Professional Master's Degree in Technical Engineering in Computer Management from the Autonomous University of Barcelona.
- Master's Degree in Artificial Intelligence from the Catholic University of Avila
- Professional Master's Degree in Business Administration and Management by IMF Smart Education
- Master's Degree in Information of Systems Management by IMF Smart Education
- Postgraduate Degree in Design Patterns, Catalunya Open University



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Structure and Content

This Postgraduate Certificate brings together in one module specialized knowledge in the different options offered by *Computer Vision* in the industry. It also develops the different options currently available on the market, and delves into the global structure of a model by applying the *Transfer Learning technique.* All this from a practical and innovative business perspective so that the computer scientist can apply it directly to the successful completion of his or her studies.

It addresses one of the fields with the greatest development forecasts in the world of Artificial Intelligence"

Module 1. R&D and AI *Computer Vision*. Object Identification and Tracking

1.1. Computer Vision
- 1.1.1. *Computer Vision.*
- 1.1.2. Computational Vision
- 1.1.3. Interpretation of the Machines in an Image

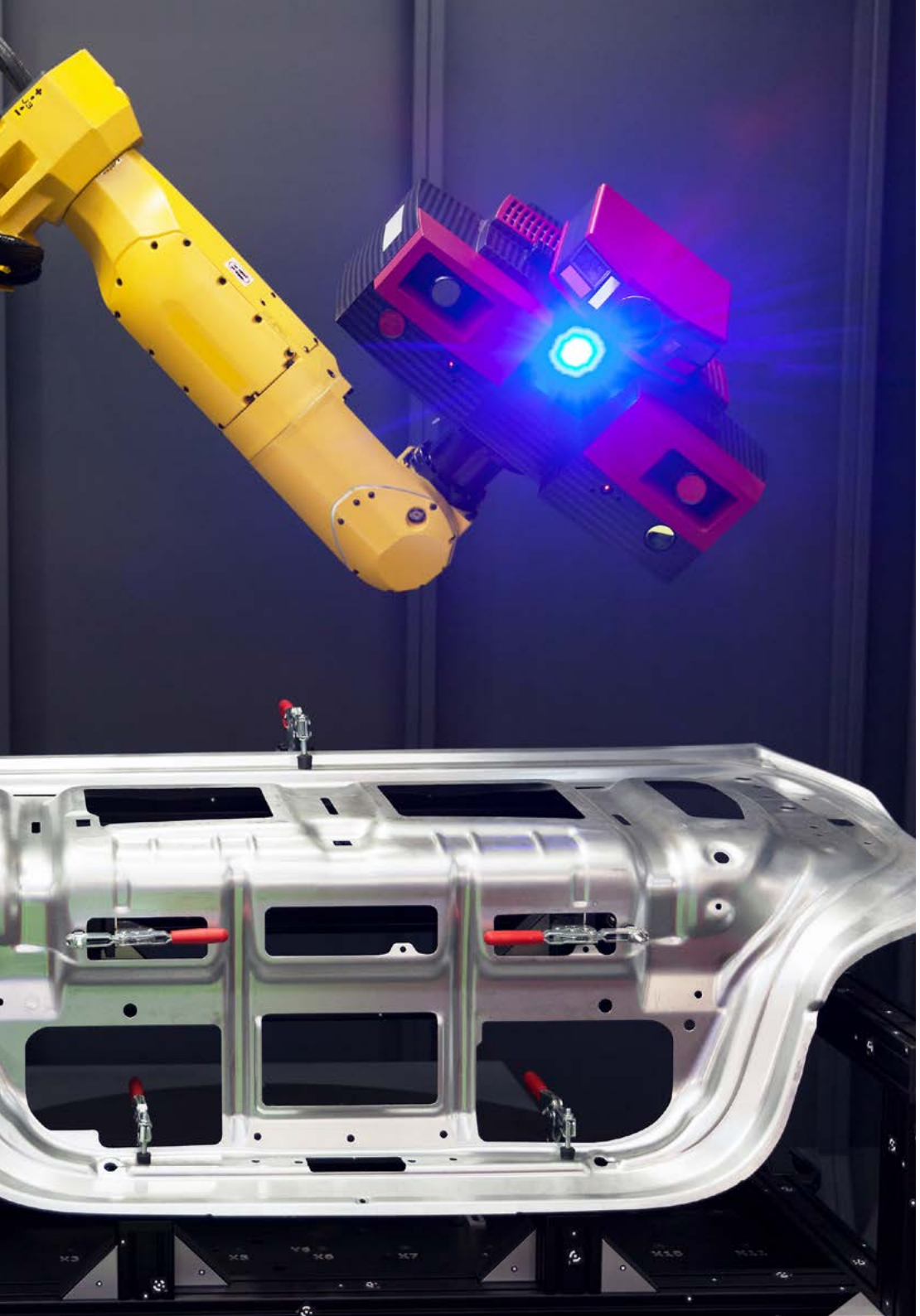
1.2. Activation Functions
- 1.2.1. Activation Functions
- 1.2.2. Sigmoid
- 1.2.3. RELU
- 1.2.4. Hyperbolic Tangent
- 1.2.5. *Softmax*

1.3. Construction of Convolutional Neural Networks
- 1.3.1. Convolution Operation
- 1.3.2. ReLU Layer
- 1.3.3. *Pooling*
- 1.3.4. *Flattering*
- 1.3.5. *Full Connection*

1.4. Convolution Process
- 1.4.1. How a Convolution Works
- 1.4.2. Convolution Code
- 1.4.3. Convolution. Application

1.5. Transformations with Images
- 1.5.1. Transformations with Images
- 1.5.2. Advanced Transformations
- 1.5.3. Transformations with Images. Application
- 1.5.4. Transformations with Images. *Use Case*

1.6. *Transfer Learning*
- 1.6.1. *Transfer Learning*
- 1.6.2. *Transfer Learning* Typology
- 1.6.3. Deep Networks to Apply *Transfer Learning*



1.7. *Computer Vision. Use Case*
- 1.7.1. Image Classification
- 1.7.2. Object Detection
- 1.7.3. Object Identification
- 1.7.4. Object Segmentation

1.8. Object Detection
- 1.8.1. Convolution-Based Detection
- 1.8.2. R-CNN, Selective Search
- 1.8.3. Rapid Detection with YOLO
- 1.8.4. Other Possible Solutions

1.9. GAN. *Generative Adversarial Networks*
- 1.9.1. Generative Adversarial Networks
- 1.9.2. Code for a GAN
- 1.9.3. GAN. Application

1.10. Application of *Computer Vision* Models
- 1.10.1. Content Organization
- 1.10.2. Visual Search Engines
- 1.10.3. Facial Recognition
- 1.10.4. Augmented Reality
- 1.10.5. Autonomous Driving
- 1.10.6. Fault Identification at each Assembly
- 1.10.7. Pest Identification
- 1.10.8. Health

Computer Vision has a strong relationship with Robotics, autonomous vehicles and the emerging field of Emotive Computing"

05

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

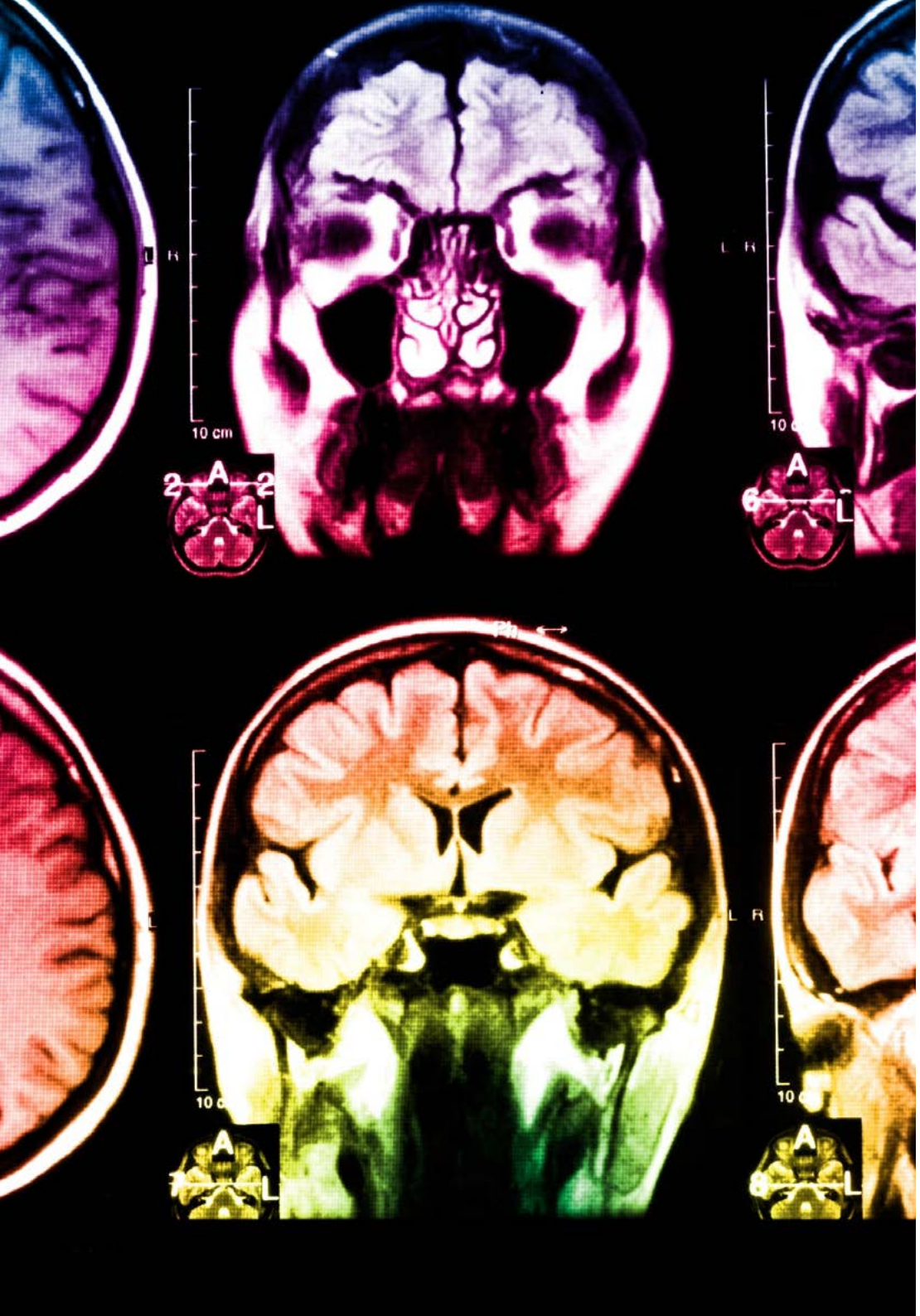
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.

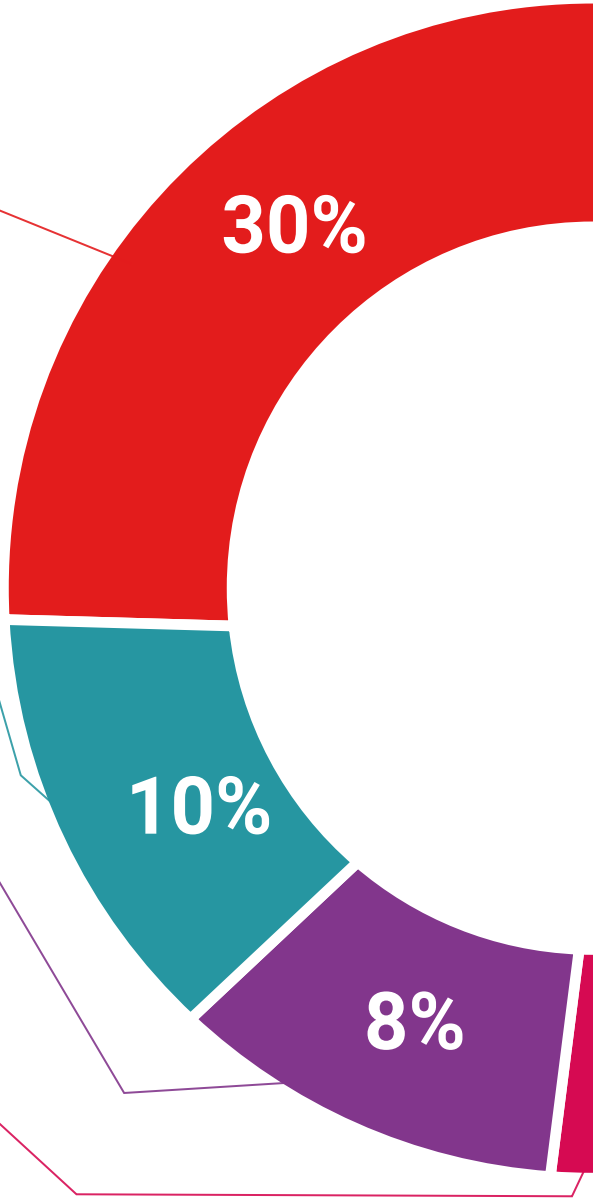
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

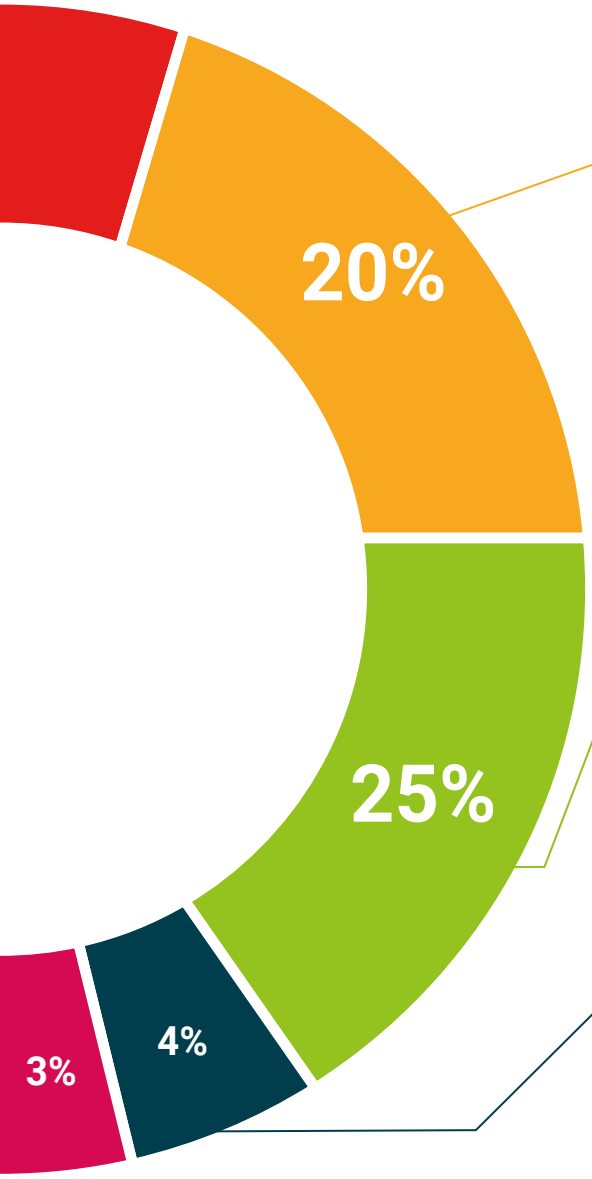
Practising Skills and Abilities

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.

06

Certificate

The Postgraduate Certificate in Computer Vision guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.

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

This **Postgraduate Certificate in Computer Vision** contains the most complete and up-to-date program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Certificate** issued by **TECH Technological University** via tracked delivery*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the **Postgraduate Certificate**, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **This Postgraduate Certificate in Computer Vision**

Official Nº of Hours: **150 h.**


tech technological university

Awards the following

CERTIFICATE

to

Mr./Ms. _____, with identification number _____.

For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Computer Vision

This is a qualification awarded by this University, equivalent to 150 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro

Dean

Unique TECH Code: AFWORD23S techtitute.com/certificates

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

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