Postgraduate Certificate

Deep Learning

tech technological university

tech technological university

Postgraduate Certificate
Deep Learning

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

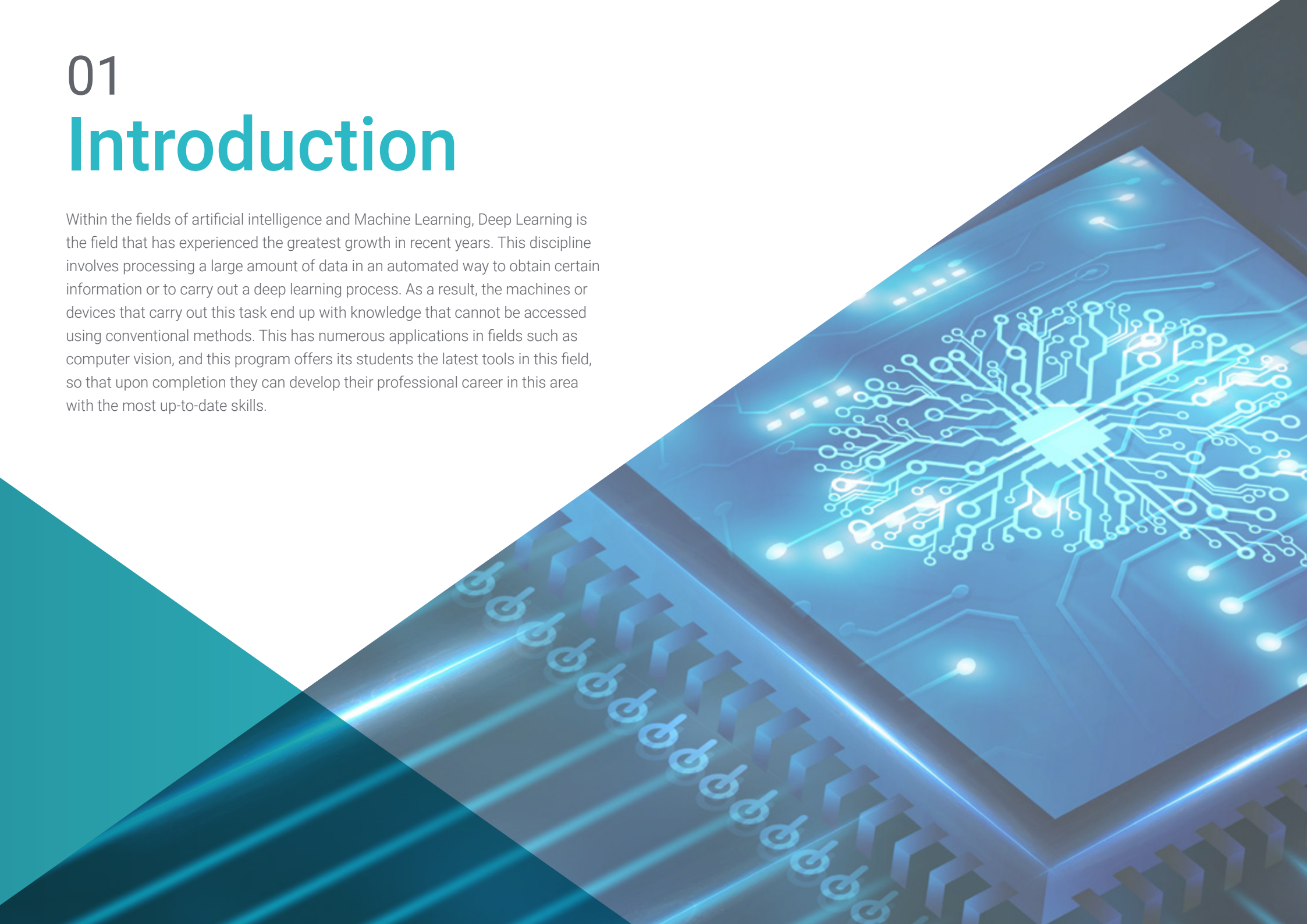
Website: www.techtitute.com/us/information-technology/postgraduate-certificate/deep-learning

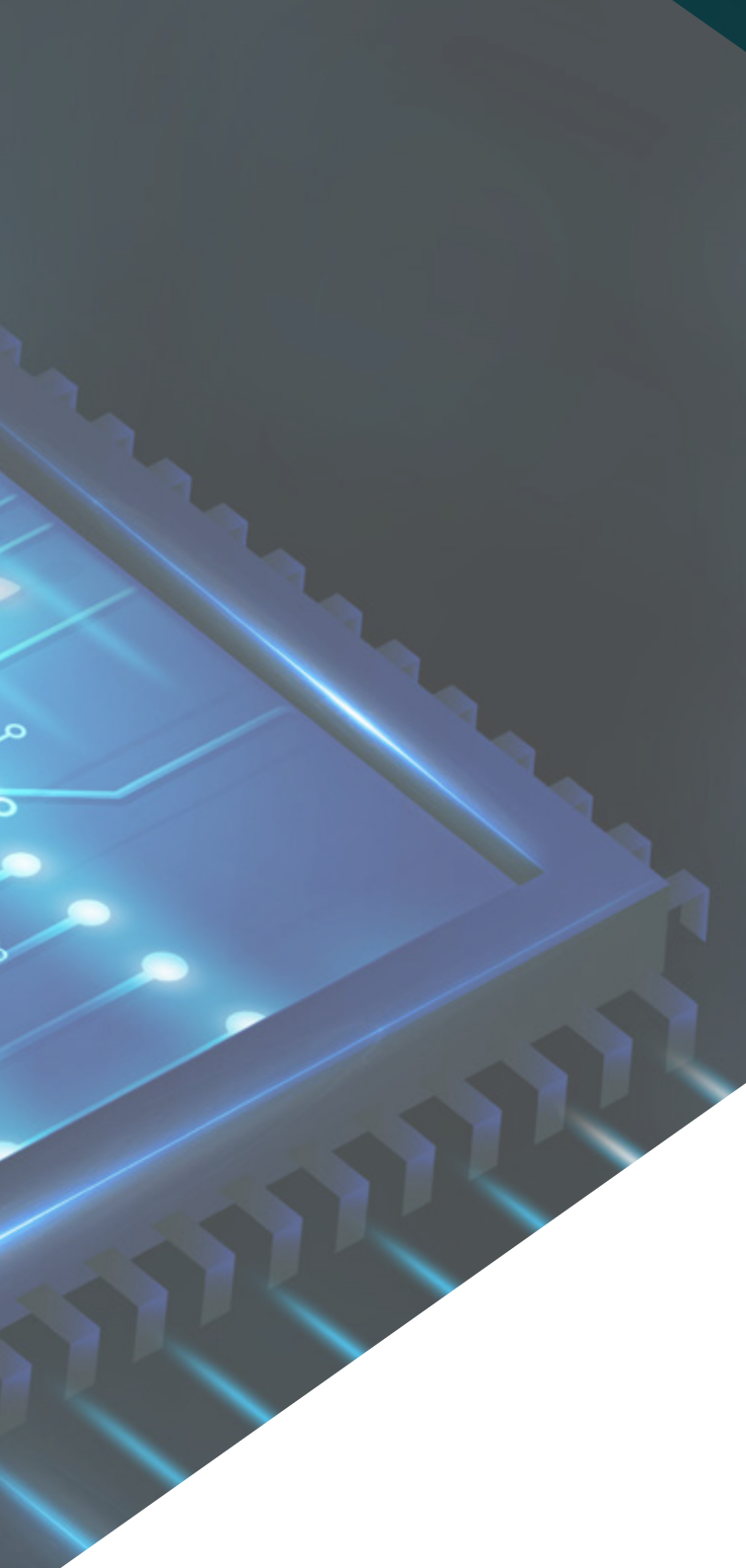
Index

01

Introduction

Within the fields of artificial intelligence and Machine Learning, Deep Learning is the field that has experienced the greatest growth in recent years. This discipline involves processing a large amount of data in an automated way to obtain certain information or to carry out a deep learning process. As a result, the machines or devices that carry out this task end up with knowledge that cannot be accessed using conventional methods. This has numerous applications in fields such as computer vision, and this program offers its students the latest tools in this field, so that upon completion they can develop their professional career in this area with the most up-to-date skills.





Delve into Deep Learning and apply its principles to your computer vision projects thanks to the new developments in this area offered by this Postgraduate Certificate"

Today's technological world cannot be understood without the advances in artificial intelligence and its subspecialties such as Machine Learning or computer vision. Therefore, one of them that is of great importance is Deep Learning, which consists of deep and systematic learning carried out by a machine or device performing a specific activity. After a while, the machine can perform complex tasks based on the knowledge it has acquired, tasks that are virtually impossible for a conventional computer or a human being.

For this reason, it is a vital field in today's technology, and is undergoing constant advances that must be known in order to be able to work in this field according to the latest innovations. This Postgraduate Certificate in Deep Learning explores a whole series of issues related to this discipline, such as neural networks, activation functions or hardware for the training phase.

In addition, the student will work under the guidance of leading experts in this field, as well as numerous multimedia teaching resources such as video techniques, master classes, practical exercises or interactive summaries. All using a 100% online teaching methodology specially designed for professionals to balance their work with their studies.

This **Postgraduate Certificate in Deep Learning** contains the most complete and up-to-date educational program on the market. The most important features include:

- The development of case studies presented by experts in deep learning
- 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 the self-assessment process can be carried out 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

The latest innovations in Deep Learning are here. Don't wait any longer and specialize"

Technology is advancing rapidly, and constant updating is needed in the field of Deep Learning. This Postgraduate Certificate brings you up to date, preparing you for the present and the future of the profession"

Deep Learning is fundamental in the field of computer vision. Incorporate the best techniques into your daily work and progress in the field of artificial intelligence.

TECH Technological University's teaching methodology allows students to decide how, when and where to study, adapting to their personal and professional circumstances.

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.

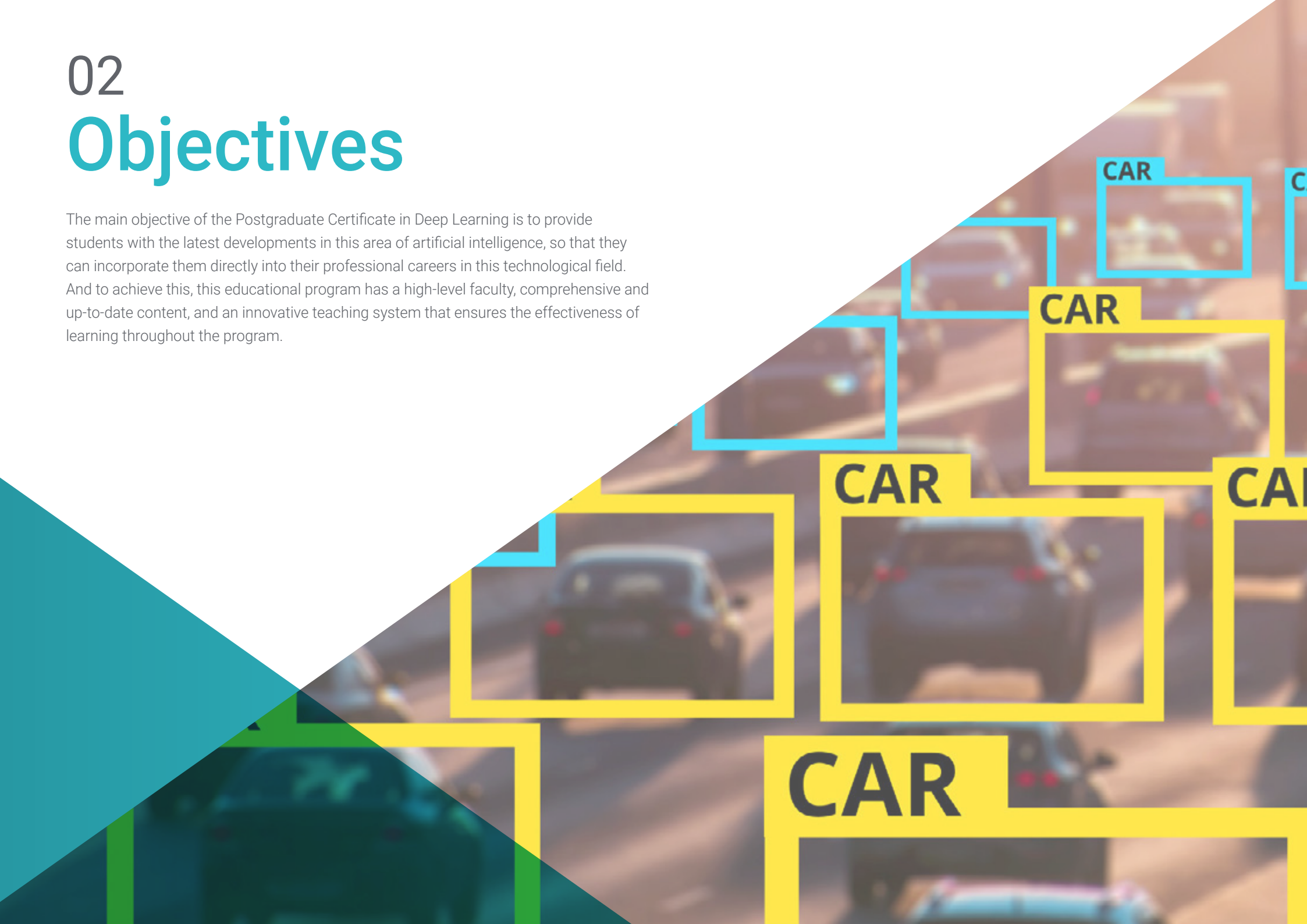
The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive education programmed to learn in real situations.

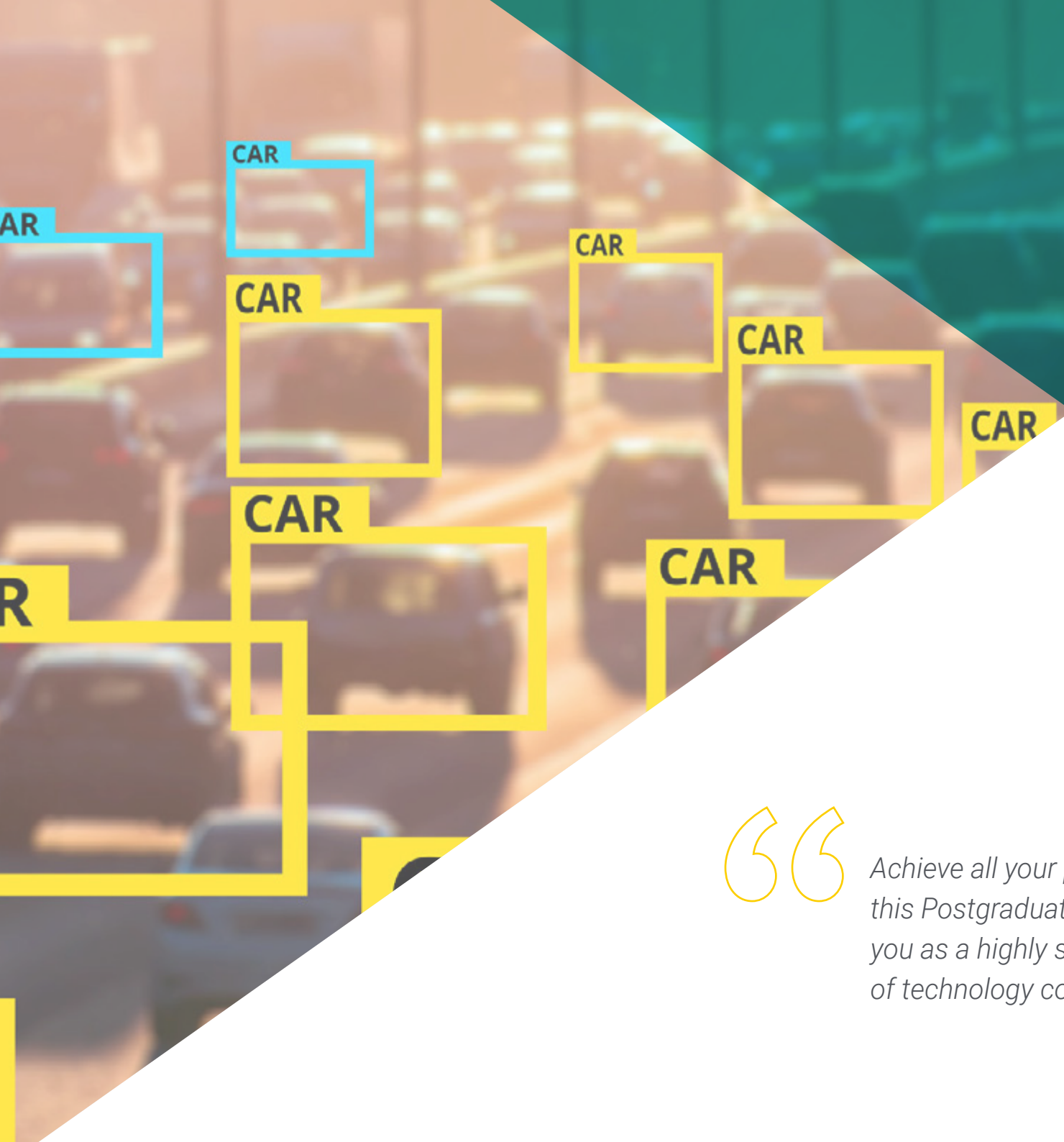
This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise during the academic year. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced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

02

Objectives

The main objective of the Postgraduate Certificate in Deep Learning is to provide students with the latest developments in this area of artificial intelligence, so that they can incorporate them directly into their professional careers in this technological field. And to achieve this, this educational program has a high-level faculty, comprehensive and up-to-date content, and an innovative teaching system that ensures the effectiveness of learning throughout the program.



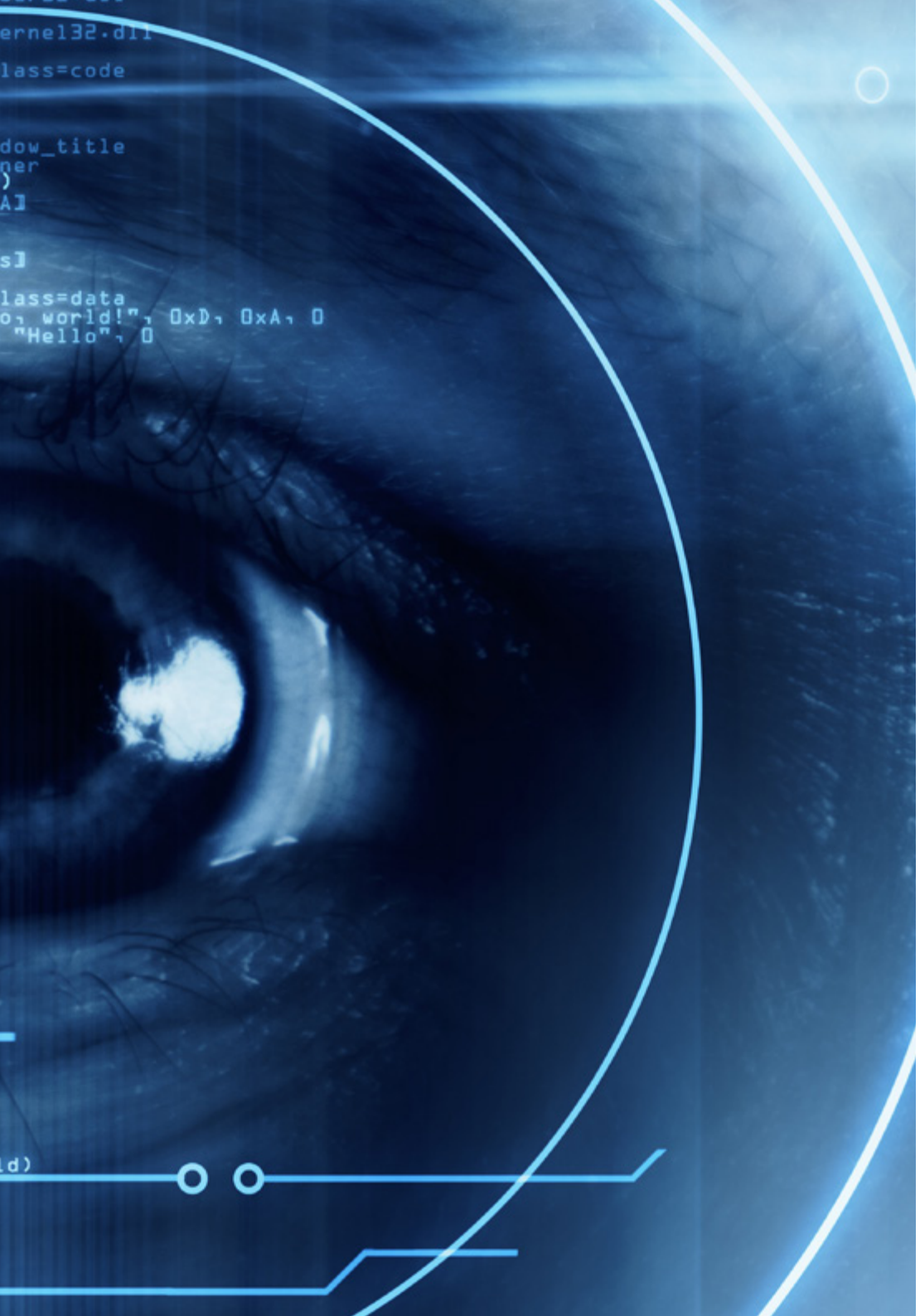


Achieve all your professional goals thanks to this Postgraduate Certificate, which will position you as a highly sought-after expert in the eyes of technology companies in your environment"

General Objectives

- Generate specialized knowledge about Deep Learning
- Introduce neural networks and examine how they work
- Analyze metrics for proper learning
- Understanding the mathematics behind neural networks

Specialize in Deep Learning and reach numerous career opportunities"



Specific Objectives

- 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

03

Course Management

This Postgraduate Certificate in Deep Learning has the most expert and experienced teachers in this area, and they will transfer all their knowledge to the students of the program. Therefore, they will have at their disposal the most advanced tools in this field, fully tested in the professional environment. In this way, they will have new skills that they will be able to apply immediately in their careers.

There is no better teaching chart than this one in the field of deep learning applied to computer vision. Enroll now and check it out"

Management

Mr. Redondo Cabanillas, Sergio

- Head of Bcnvision's R&D Department
- Project and development manager at Bcnvision
- Machine vision applications engineer at Bcnvision
- Technical Engineering in Telecommunications. Specialization in Image and Sound at the Polytechnic University of Catalonia
- Graduate in Telecommunications. Specialization in Image and Sound by the Polytechnic University of Catalonia
- Lecturer in Cognex vision training for Bcnvision customers
- Teacher in internal courses at Bcnvision to the technical department on vision and advanced development in c#

Professors

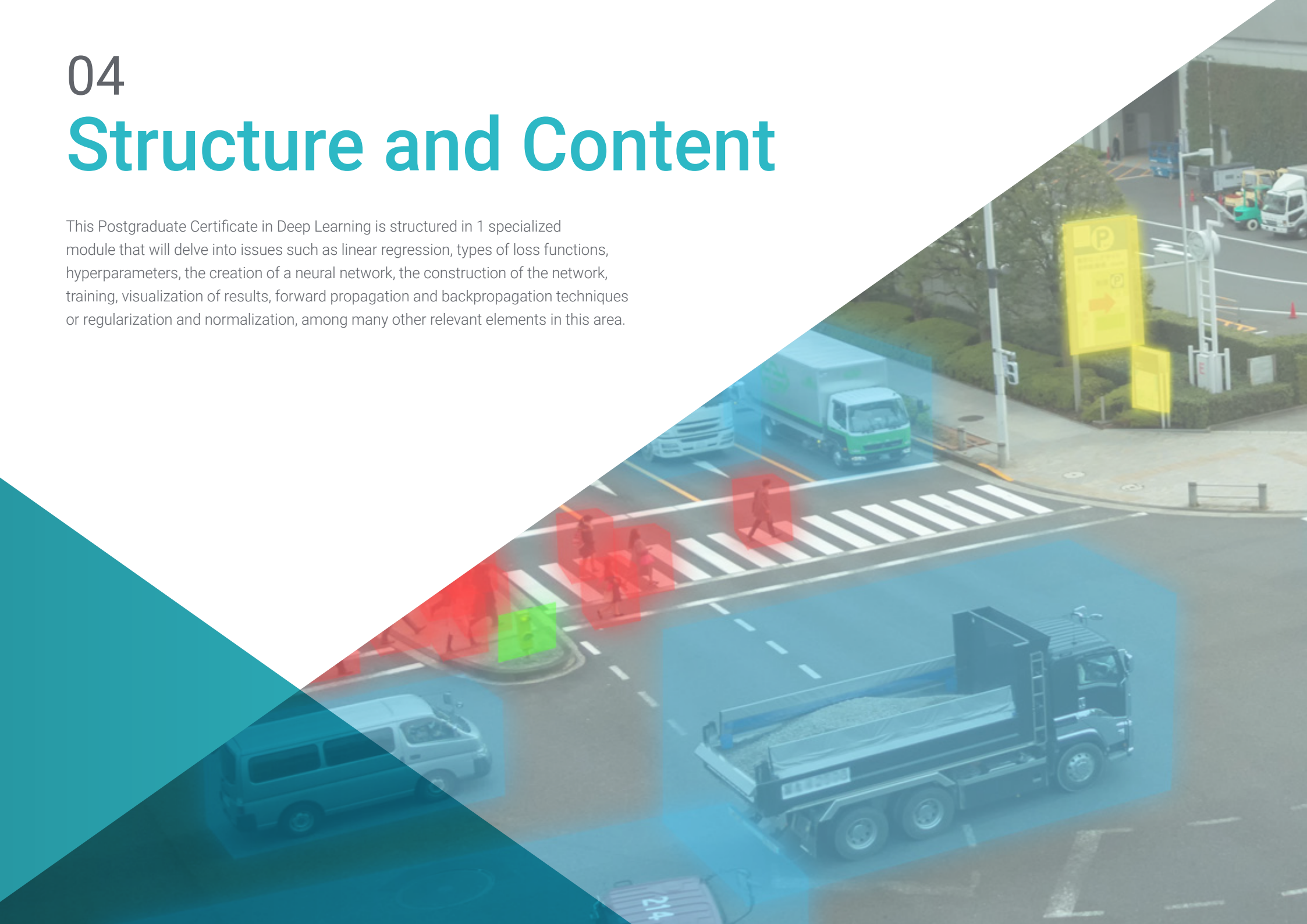
Dr. Riera i Marín, Meritxell

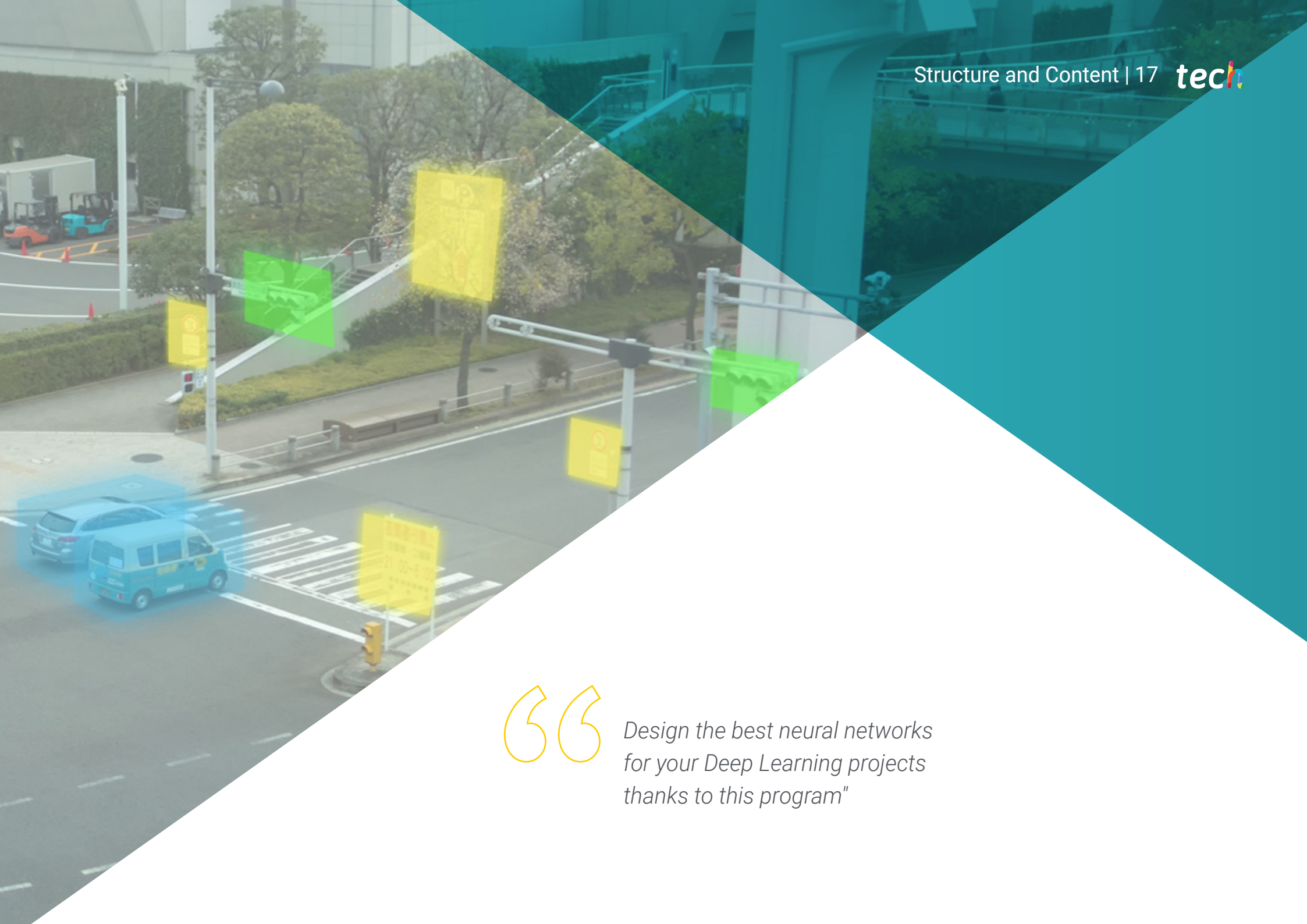
- Deep Learning developer. Sycai Medical. Barcelona
- Researcher. National Center for Scientific Research (CNRS). Marseille, France
- Software engineer. Zhilabs. Barcelona
- IT Technician, Mobile World Congress
- Software engineer. Avanade. Barcelona
- Telecommunications Engineering at UPC. Barcelona
- PhD. University Pompeu Fabra (UPF) - Barcelona. Industrial PhD in collaboration with Sycai Medical
- Master of Science: Spécialité Signal, image, systèmes embarqués, automatique (SISEA) at IMT Atlantique. Pays de la Loire - Brest, France
- Master in Telecommunications Engineering at UPC. Barcelona

04

Structure and Content

This Postgraduate Certificate in Deep Learning is structured in 1 specialized module that will delve into issues such as linear regression, types of loss functions, hyperparameters, the creation of a neural network, the construction of the network, training, visualization of results, forward propagation and backpropagation techniques or regularization and normalization, among many other relevant elements in this area.





Design the best neural networks for your Deep Learning projects thanks to this program"

Module 1. Deep Learning

1.1. Artificial Intelligence
- 1.1.1. Machine Learning
- 1.1.2. Deep Learning
- 1.1.3. The Explosion of Deep Learning Why Now?

1.2. Neural Networks
- 1.2.1. The Neural Network
- 1.2.2. Uses of Neural Networks
- 1.2.3. Linear Regression and Perceptron
- 1.2.4. Forward Propagation
- 1.2.5. Backpropagation
- 1.2.6. Feature Vectors

1.3. Loss Functions
- 1.3.1. Loss Functions
- 1.3.2. Types of Loss Functions
- 1.3.3. Choice of Loss Functions

1.4. Activation Functions
- 1.4.1. Activation Function
- 1.4.2. Linear Functions
- 1.4.3. Non-Linear Functions
- 1.4.4. Output vs. Hidden Layer Activation Functions

1.5. Regularization and Normalization
- 1.5.1. Regularization and Normalization
- 1.5.2. Overfitting and Data Augmentation
- 1.5.3. Regularization Methods: L1, L2 and Dropout
- 1.5.4. Normalization Methods: Batch, Weight, Layer

1.6. Optimization
- 1.6.1. Gradient Descent
- 1.6.2. Stochastic Gradient Descent
- 1.6.3. Mini Batch Gradient Descent
- 1.6.4. Momentum
- 1.6.5. Adam

1.7. Hyperparameter Tuning and Weights
- 1.7.1. Hyperparameters
- 1.7.2. Batch Size vs. Learning Rate vs. Step Decay
- 1.7.3. Weights

1.8. Evaluation Metrics of a Neural Network
- 1.8.1. Accuracy
- 1.8.2. Dice Coefficient
- 1.8.3. Sensitivity Vs. Specificity/Recall Vs. Precision
- 1.8.4. ROC Curve (AUC)
- 1.8.5. F1-Score
- 1.8.6. Matrix Confusion
- 1.8.7. Cross-Validation

1.9. Frameworks and Hardware
- 1.9.1. Tensor Flow
- 1.9.2. Pytorch
- 1.9.3. Caffe
- 1.9.4. Keras
- 1.9.5. Hardware for the Learning Phase

1.10. Creation of a Neural Network-Training and Validation.
- 1.10.1. Dataset
- 1.10.2. Network Construction
- 1.10.3. Training
- 1.10.4. Visualization of Results

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

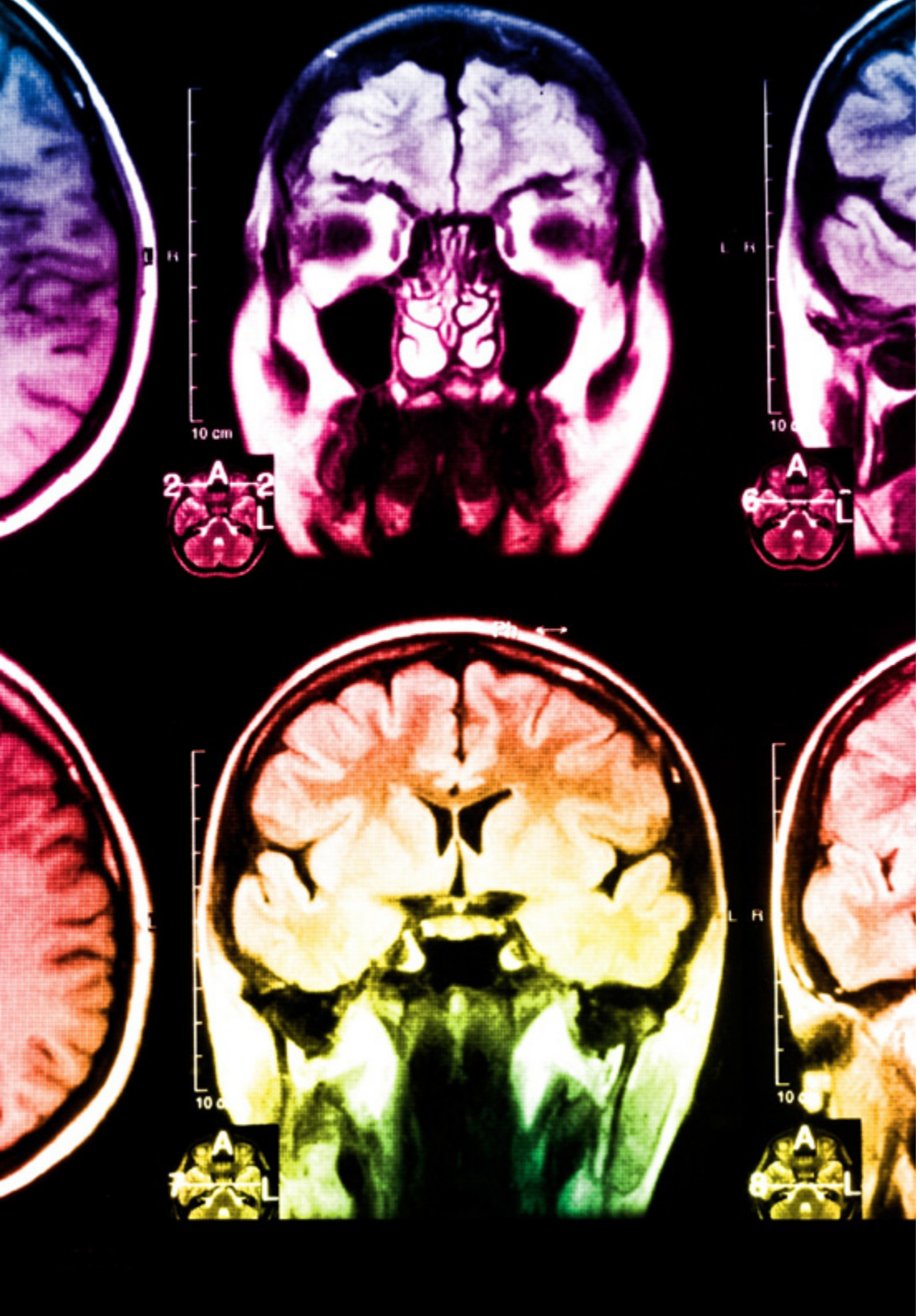
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.

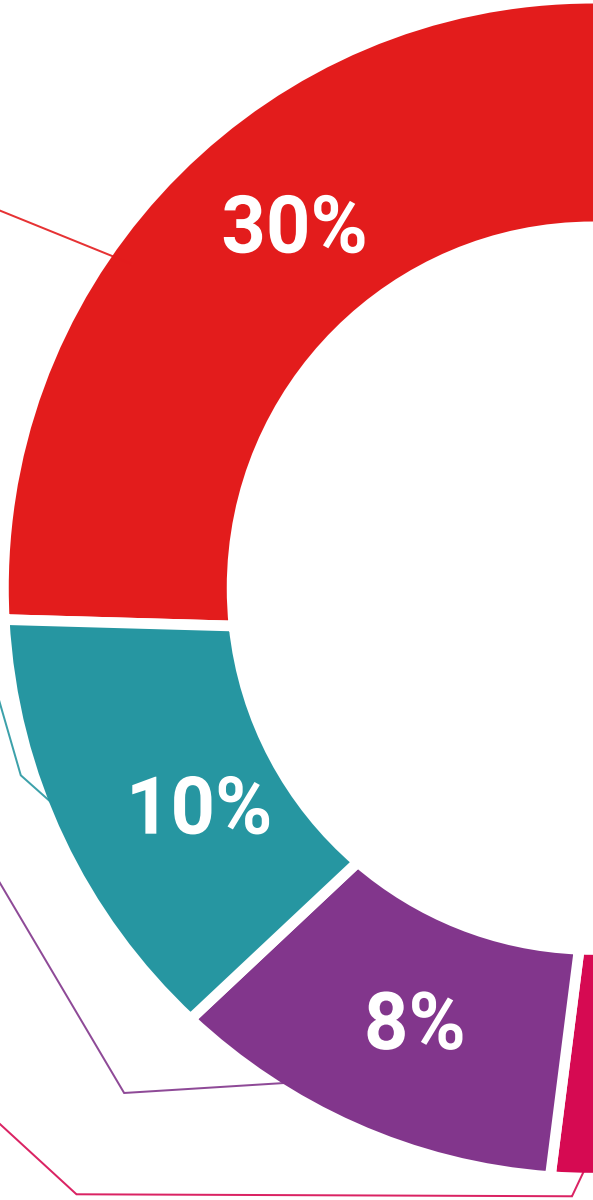
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

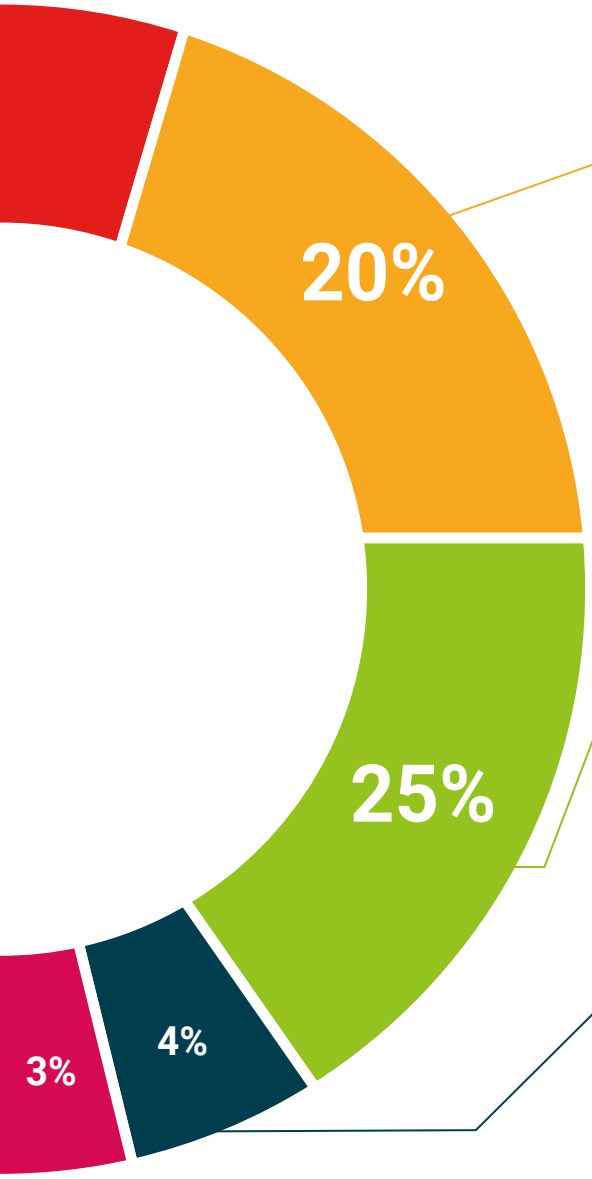
Practising Skills and Abilities

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 Deep Learning 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 Deep Learning** 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 diploma 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: **Postgraduate Certificate in Deep Learning**

Official Nº of Hours: **150 h..**


tech technological university

Awards the following

DIPLOMA

to

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

For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Deep Learning

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

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country. Unique TECH Code: AFWORD23S techtitute.com/certificates

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

tech technological university

Postgraduate Certificate
Deep Learning

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

Postgraduate Certificate
Deep Learning

tech technological university