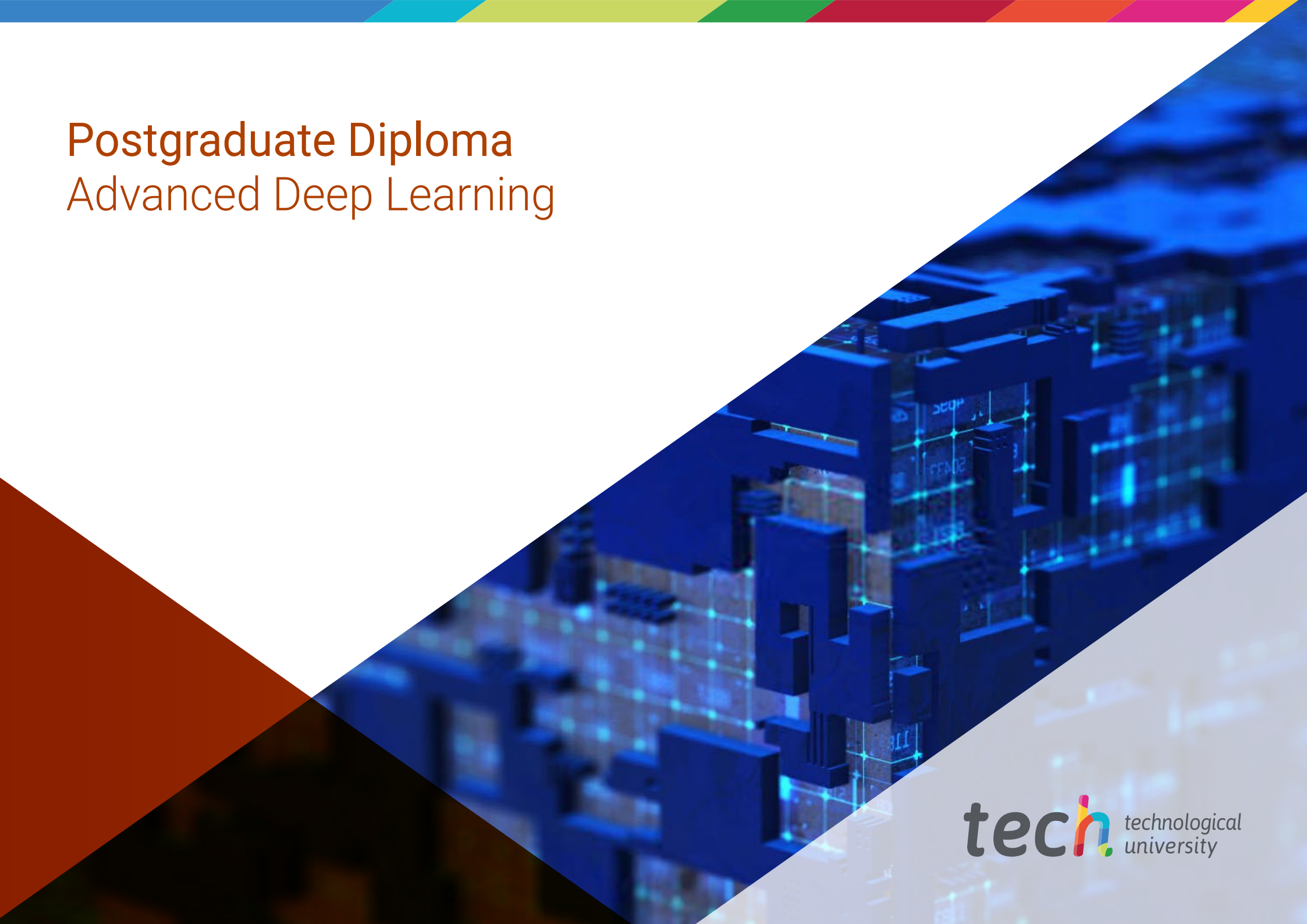
Postgraduate Diploma
Advanced Deep Learning



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Postgraduate Diploma
Advanced Deep Learning

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

Website: **www.techtitute.com/pk/engineering/postgraduate-diploma/postgraduate-diploma-advanced-deep-learning**

Index

01

Introduction

A LinkedIn report indicates that Deep Learning is the most demanded technical skill by employers today, and its usefulness extends to various fields, from medicine to the automotive industry. For example, in the automotive field,field, it is used for real-time object detection and recognition in driver assistance systems. With the objective of updating engineers in neural networks, TECH has assembled a team of experts in Deep Learning and has compiled advanced tools for the development of skills in this area. In addition, the 100% online format of the program allows students to adapt the study load to their own pace, without the need for attendance to classes or adjusting to fixed schedules.

You will have access to a library full of high quality multimedia content presented in different audiovisual formats, which you can download and consult whenever and wherever you want"

Deep Learning, one of the fundamental technologies of artificial intelligence, has led to important advances in areas such as computer vision, natural language processing and robotics. For example, Amazon Alexa's voice recognition technology is based on deep learning and has an accuracy of 95%. In addition, Deep Learning has the capacity to solve important problems in society, such as the early detection of diseases, the forecasting of natural disasters and the fight against climate change. In fact, Deep Learning has been successfully used to forecast the melting of glaciers with an accuracy of 96%.

Under these circumstances, TECH has designed a comprehensive educational program that allows students to explore in depth the fundamental principles of Deep Learning and its mathematical foundations. As the demand for qualified professionals in this field continues to grow and investment in Artificial Intelligence is increasing, this program presents itself as an excellent option for professional development. In addition, the availability of resources and supportive communities, the intellectual challenge involved and its potential for innovation are other factors that make this program an attractive choice for those seeking to enhance their knowledge and skills in Deep Learning.

For this reason, TECH has created a complete program based on the Relearning methodology to facilitate the student's learning in a progressive and natural way through the repetition of the fundamental concepts. In this way, the graduate will acquire the necessary skills by adjusting the study to their life style.

Therefore, the presentation of the program in an online format allows the professional to focus on learning without having to travel or adjust to fixed schedules. In addition, they can access the theoretical and practical content from anywhere and at any time, all they need is a device with an Internet connection.

This **Postgraduate Diploma in Advanced Deep Learning** contains the most complete and up-to-date 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 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

Guarantee your professional future by completing the most complete and up-to-date Postgraduate Diploma in the academic market. And it's totally online!"

Delve into OpenAI and delve into estimating the profitability of loans with this exclusive online academic program"

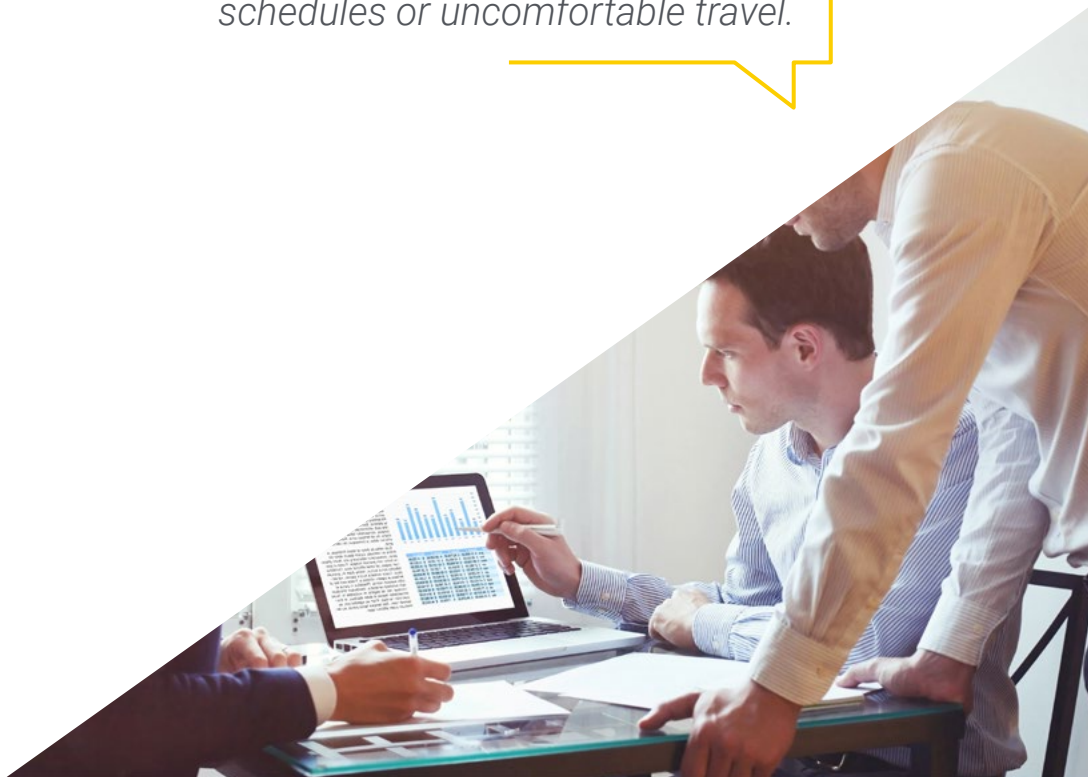
Delve into risk analysis for credit allocation and you can become a specialist in Reinforcement Learning.

TECH offers you a Virtual Campus available 24 hours a day, without the pressure of adapting to fixed schedules or uncomfortable travel.

The program includes in its teaching staff professionals from the sector who bring to this program the experience of their work, as well as recognized specialists from leading societies and prestigious universities.

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

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



02

Objectives

The knowledge acquired through the syllabus will allow the graduate to acquire a global perspective and get up to date in the key aspects of Deep Learning to achieve the proposed objectives. Consequently, the student will acquire comprehensive skills in an essential, versatile and constantly growing field of engineering, which will lead them to achieve excellence in a booming sector. In order to ensure student satisfaction, TECH has established general and specific objectives that will guide the student towards success.

Upgrade your skills in reward optimization and policy research to enhance your professional future. Now is always the best time”

General Objectives

- Lay the foundation for the key concepts of mathematical functions and their derivatives
- Apply these principles to deep learning algorithms to learn automatically
- Examine the key concepts of Supervised Learning and how they apply to neural network models
- Analyze the training, evaluation, and analysis of neural network models
- Lay the foundation for the key concepts and main applications of deep learning
- Implement and optimizes neural networks with Keras
- Develop expertise in the training of deep neural networks
- Analyze the optimization and regularization mechanisms necessary for deep network training

You will meet even your highest expectations thanks to the thoroughness with which all the topics in this TECH program have been developed"

Specific Objectives

Module 1. Deep Computer Vision with Convolutional Neural Networks

- Explore and understand how convolutional and clustering layers work for Visual Cortex architecture
- Develop CNN architectures with Keras
- Use pre-trained Keras models for object classification, localization, detection and tracking, as well as semantic segmentation

Module 2. NLP Natural Language Processing with RNN and Attention

- Generate text using recurrent neural networks
- Train an encoder-decoder network to perform neural machine translation
- Develop a practical application of Natural Language Processing with RNN and Attention

Module 3. Reinforcement Learning

- Use gradients to optimize an agent's policy
- Evaluate the use of neural networks to improve an agent's accuracy in making decisions
- Implement different reinforcement algorithms to improve the performance of an agent

03

Course Management

This TECH Postgraduate Diploma is aimed at Engineering professionals interested in updating their knowledge in Advanced Deep Learning . This program has a highly specialized and experienced teaching team in the discipline, which guarantees quality teaching. Students enrolled in this program will be able to take advantage of the experience and practice of the teaching team to face the current challenges in the field of Deep Learning and the challenges it presents within Engineering.

Expand your skills with a teaching team specialized in Advanced Deep Learning and with great professional experience"

Management

Mr. Gil Contreras, Armando

- Lead Big Data Scientist-Big Data at Jhonson Controls
- Data Scientist-Big Data at Opensistemas
- Fund Auditor at Creativity and Technology and PricewaterhouseCoopers
- Professor at EAE Business School
- Degree in Economics from the Instituto Tecnológico de Santo Domingo INTEC
- Master's Degree in Data Science at Centro Universitario de Tecnología y Arte
- Master MBA in International Relations and Business at Centro de Estudios Financieros CEF
- Postgraduate Degree in Corporate Finance at the Instituto Tecnológico de Santo Domingo

Professors

Mr. Delgado Panadero, Ángel

- ML Engenieer at Paradigma Digital
- Computer Vision Engineer at NTT Disruption
- Data Scientist at Singular People
- Data Analyst at Parclick
- Tutor at Master in Big data and Analytics at EAE Business School
- Degree in Physics at the University of Salamanca

Mr. Matos, Dionis

- Data Engineer at Wide Agency Sodexo
- Data Consultant at Tokiota Site
- Data Engineer at Devoteam Testa Home
- Business Intelligence Developer at Ibermatica Daimler
- Máster Big Data and Analytics /Project Management(Minor) at EAE Business School

Mr. Villar Valor, Javier

- Director and Founder Partner Impulsa2
- Chief Operating Officer of Summa Insurance Brokers
- Responsible for identifying improvement opportunities at Liberty Seguros
- Director of Transformation and Professional Excellence at Johnson Controls Iberia
- Responsible for the organization of the company Groupama Seguros
- Responsible for Lean Six Sigma methodology at Honeywell
- Director of Quality and Purchasing at SP & PO
- Professor at the European Business School

04

Structure and Content

Through the Relearning method, which is based on the constant repetition of key concepts throughout the academic itinerary, the engineer will be able to obtain advanced and efficient learning in the codification of deep learning models, without having to invest long hours of study. In this way, TECH offers the opportunity to delve into a complete syllabus on this currently relevant topic.

Update your skills through the most innovative practical methodology with this complete Postgraduate Diploma"

Module 1. Deep Computer Vision with Convolutional Neural Networks

1.1. Visual Cortex Architecture
- 1.1.1. Functions of the Visual Cortex
- 1.1.2. Computational Vision Theory
- 1.1.3. Image Processing Models

1.2. Convolutional Layers
- 1.2.1. Reuse of Weights in Convolution
- 1.2.2. 2D Convolution
- 1.2.3. Activation Functions

1.3. Grouping Layers and Implementation of Grouping Layers with Keras
- 1.3.1. Pooling and Striding
- 1.3.2. *Flattening*
- 1.3.3. Pooling Types

1.4. CNN Architecture
- 1.4.1. VGG Architecture
- 1.4.2. AlexNet Architecture
- 1.4.3. ResNet Architecture

1.5. Implementation of a ResNet-34 CNN using Keras
- 1.5.1. Weight Initialization
- 1.5.2. Input Layer Definition
- 1.5.3. Definition of the Output

1.6. Use of Pre-trained Keras Models
- 1.6.1. Characteristics of Pre-trained Models
- 1.6.2. Uses of Pre-trained Models
- 1.6.3. Advantages of Pre-trained Models

1.7. Pre-trained Models for Transfer Learning
- 1.7.1. Transfer Learning
- 1.7.2. Transfer Learning Process
- 1.7.3. Advantages of Transfer Learning

1.8. Classification and Localization in *Deep Computer Vision*
- 1.8.1. Image Classification
- 1.8.2. Localization of Objects in Images
- 1.8.3. Object Detection

1.9. Object Detection and Tracking
- 1.9.1. Objects Detection Methods
- 1.9.2. Object Tracking Algorithms
- 1.9.3. Tracking and Localization Techniques

1.10. Semantic Segmentation
- 1.10.1. Deep Learning for Semantic Segmentation
- 1.10.2. Edge Detection
- 1.10.3. Rule-Based Segmentation Methods

Module 2. Natural Language Processing (NLP) with Recurrent Neural Networks (RNN) and Attention

2.1. Text Generation using RNN
- 2.1.1. Training an RNN for Text Generation
- 2.1.2. Natural Language Generation with RNN
- 2.1.3. Text Generation Applications with RNN

2.2. Creation of the Training Dataset
- 2.2.1. Preparation of the Data for RNN Training
- 2.2.2. Storage of the Training Dataset
- 2.2.3. Data Cleaning and Transformation

2.3. Sentiment Analysis
- 2.3.1. Classification of Opinions with RNN
- 2.3.2. Detection of Topics in Comments
- 2.3.3. Sentiment Analysis with Deep Learning Algorithms

2.4. Encoder-Decoder Network for Neural Machine Translation
- 2.4.1. Training a RNN for Machine Translation
- 2.4.2. Use of an Encoder-Decoder Network for Machine Translation
- 2.4.3. Improving the Accuracy of Machine Translation with a RNN

2.5. Attention Mechanisms
- 2.5.1. Application of Attention Mechanisms in RNN
- 2.5.2. Use of Attention Mechanisms to Improve the Accuracy of the Models
- 2.5.3. Advantages of Attention Mechanisms in Neural Networks

2.6. Transformer Models
- 2.6.1. Use of Transformers Models for Natural Language Processing
- 2.6.2. Application of Transformers Models for Vision
- 2.6.3. Advantages of Transformers Models

2.7. Transformers for Vision
- 2.7.1. Use of Transformers Models for Vision
- 2.7.2. Image Data Pre-Processing
- 2.7.3. Transformer Model Training for Vision

2.8. Hugging Face Transformer Library
- 2.8.1. Use of the Hugging Face Transformers Library
- 2.8.2. Application of the Hugging Face Transformers Library
- 2.8.3. Advantages of the Hugging Face Transformers Library

2.9. Other Transformers Libraries. Comparison
- 2.9.1. Comparison of the Different Transformers Libraries
- 2.9.2. Use of the Other Transformers Libraries
- 2.9.3. Advantages of Other Transformers Libraries

2.10. Development of an NLP Application with RNN and Attention. Practical Application
- 2.10.1. Development of a Natural Language Processing Application with RNN and Attention
- 2.10.2. Use of RNN, Attention Mechanisms and Transformers Models in the Application
- 2.10.3. Assessment of the Practical Application

Module 3. Reinforcement Learning

3.1. Optimization of Rewards and Policy Searching
- 3.1.1. Reward Optimization Algorithms
- 3.1.2. Policy Search Processes
- 3.1.3. Reinforcement Learning for Reward Optimization

3.2. OpenAI
- 3.2.1. OpenAI Gym Environment
- 3.2.2. Creation of OpenAI Environments
- 3.2.3. Reinforcement Learning Algorithms in OpenAI

3.3. Neural Network Policies
- 3.3.1. Convolutional Neural Networks for Policy Searching
- 3.3.2. Deep Learning Policies
- 3.3.3. Neural Networks Policy Expansion

3.4. Stock Assessment: the Problem of Credit Allocation
- 3.4.1. Risk Analysis for Credit Allocation
- 3.4.2. Estimation of Loan Profitability
- 3.4.3. Credit Assessment Models Based on Neural Networks

3.5. Policy Gradients
- 3.5.1. Reinforcement Learning with Policy Gradients
- 3.5.2. Optimization of Policy Gradients
- 3.5.3. Policy Gradients Algorithms

3.6. Markov Decision Processes
- 3.6.1. Optimization of Markov Decision Processes
- 3.6.2. Reinforcement Learning for Markov Decision Processes
- 3.6.3. Models of Markov Decision Processes

3.7. Temporal Difference Learning and Q-Learning
- 3.7.1. Application of Temporal Differences in Learning
- 3.7.2. Application of Q-Learning in Learning
- 3.7.3. Optimization of Q-Learning Parameters

3.8. Implementation of Deep Q-Learning and Deep Q-Learning Variants
- 3.8.1. Construction of Deep Neural Networks for Deep Q-Learning
- 3.8.2. Deep Q-Learning Implementation
- 3.8.3. Deep Q-Learning Variations

3.9. Reinforcement Learning Algorithms
- 3.9.1. Reinforcement Learning Algorithms
- 3.9.2. Reward Learning Algorithms
- 3.9.3. Punishment Learning Algorithms

3.10. Design of a Reinforcement Learning Environment. Practical Application
- 3.10.1. Design of a Reinforcement Learning Environment
- 3.10.2. Reinforcement Learning Algorithm Implementation
- 3.10.3. Reinforcement Learning Algorithm Assessment

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 is the most widely used learning system in the best faculties in the world. 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 program, the studies 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

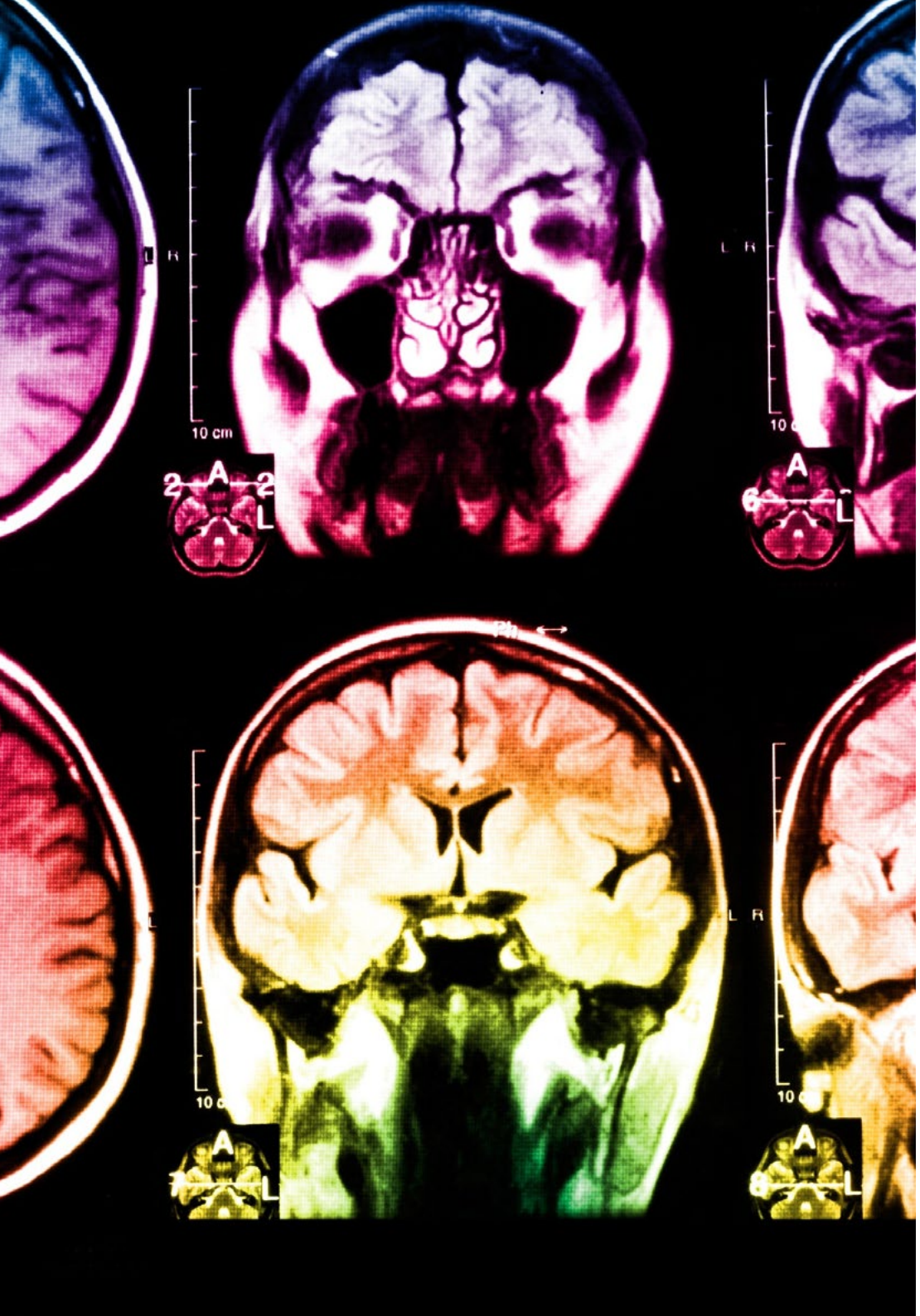
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

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.

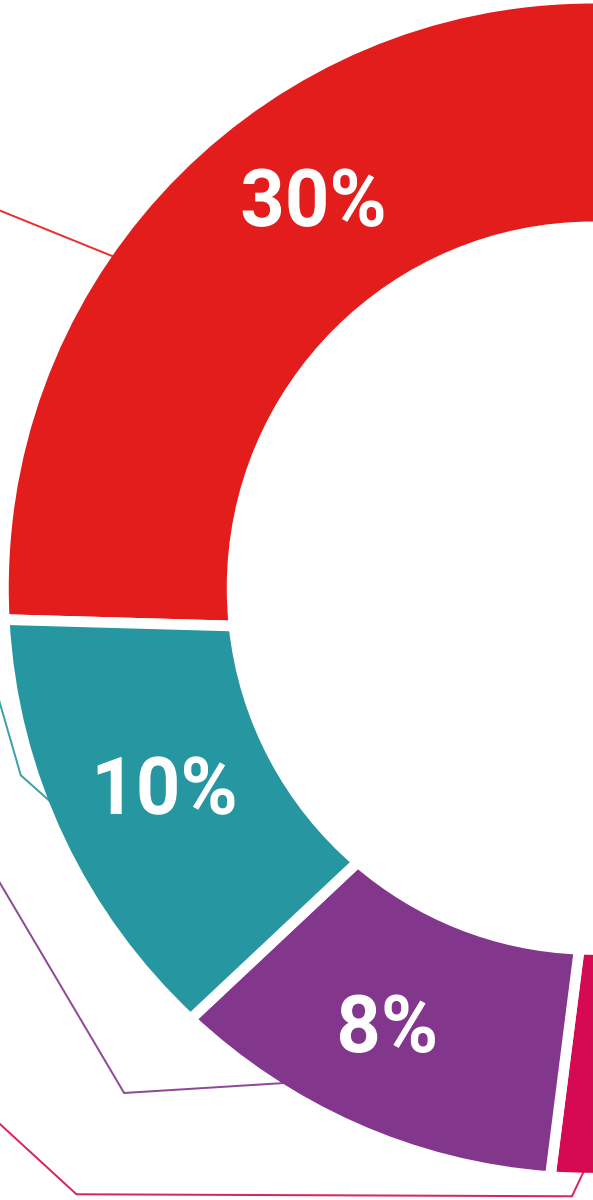
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

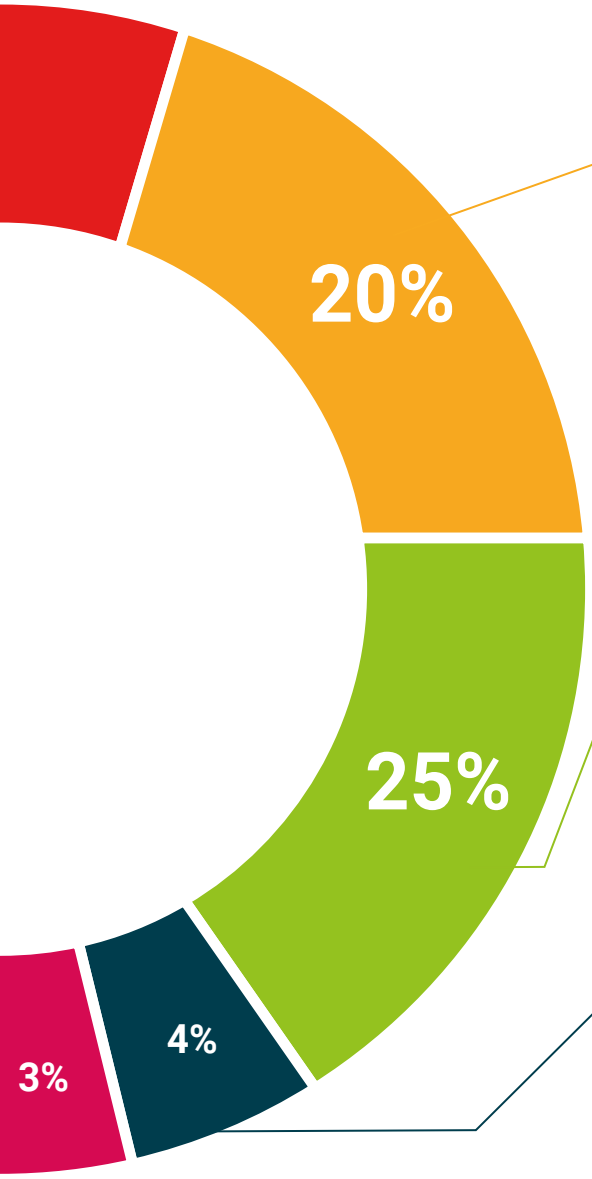
Practising Skills and Abilities

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 Diploma in Advanced Deep Learning guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma 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 Diploma in Advanced 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 Diploma** issued by **TECH Technological University** via tracked delivery*.

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

Title: **Postgraduate Diploma in Advanced Deep Learning**

Official No. of Hours: **450 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

Advanced Deep Learning

This is a qualification awarded by this University, equivalent to 450 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 certificate issued with an apostille, TECH EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

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Postgraduate Diploma
Advanced Deep Learning

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

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