

Postgraduate Certificate Training of Deep Neural Networks in Deep Learning



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

Website: www.techtitute.com/us/artificial-intelligence/postgraduate-certificate/training-deep-neural-networks-deep-learning

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01

Introduction

Deep Learning is gaining more and more weight in the business environment. This branch of Artificial Intelligence mimics the functioning of the human brain using various algorithms. In this way, machines can learn autonomously and perform complex tasks ranging from voice recognition to the generation of multimedia content. In this sense, these systems drive innovation by enabling organizations to develop both new products and services based on advanced technologies. They also gain an important competitive advantage by using these tools to deliver more personalized experiences to consumers. For this reason, TECH is launching an online university program that will delve into the design, training and evaluation of Deep Learning models.



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Through this 100% online Postgraduate Certificate, you will gain new skills to perform Image Transformations and increase variability in training data"

Transfer Learning refers to a grouping of methods with which a model developed for a specific task can be used as a starting point for the execution of a different task. For example, pre-trained systems in medical imaging (such as MRI) can be transferred or tuned to diagnose specific diseases such as cancer. This makes this technique a valuable tool in the arsenal of Deep Learning specialists, as well as reducing both the time and resources needed to train models and improve generalization on small datasets.

In this context, TECH develops a revolutionary program on Deep Neural Network Training in Deep Learning. Designed by experts in this field, the curriculum will delve into aspects such as feature extraction, reuse of pre-trained layers or learning rate scheduling. In this way, practitioners will enrich their daily practice with state-of-the-art methods to ensure the effectiveness of neural architectures. The curriculum will also provide students with practical guidelines including the selection of metrics, evaluation parameters and hypothesis testing. The program will also address regularization procedures, in order for students to adequately prevent overfitting in Neural Network models.

On the other hand, the university program has a totally online format, easy to access from any device with an Internet connection and without predetermined schedules. Therefore, specialists will be able to perfectly combine their studies with the rest of their daily obligations. Along the same lines, TECH is based on the cutting-edge Relearning teaching method. This consists of the progressive repetition of key content, so that students experience natural and effective learning without the need to resort to techniques that involve extra effort, such as traditional memorization.

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

- The development of practical cases presented by experts in Training of Deep Neural Networks in Deep Learning
- The graphic, schematic and practical contents of the program provide Sports and practical information on those 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



TECH offers you the most complete and updated scientific program on the market. You will be an expert in Deep Learning!"

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Are you looking to specialize in Pretrained Layer Reuse? Achieve it with this university program in just 150 hours”

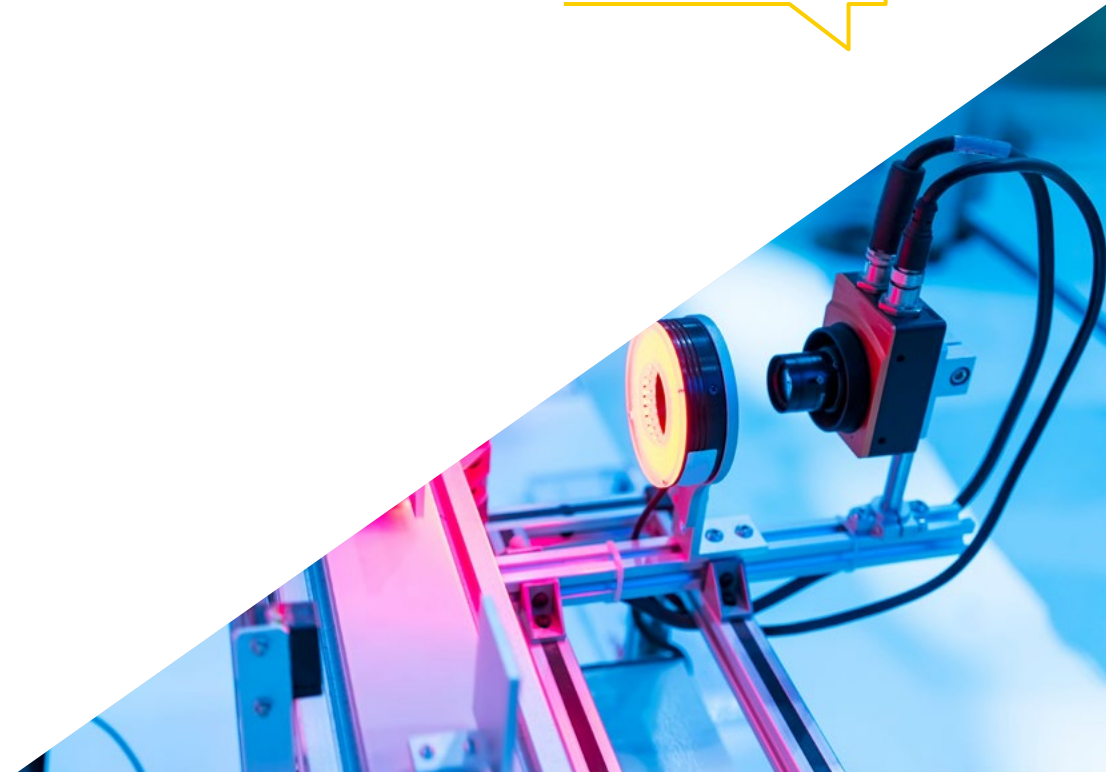
You will master Data Augmentation to improve the generalization and robustness of Machine Learning models.

You will delve into the modules of this program through the innovative Relearning methodology, incorporating the most complex concepts in a fast and flexible way.

The program's teaching staff includes professionals from the sector who contribute their work experience to this 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 students will be assisted by an innovative interactive video system created by renowned and experienced experts.



02

Objectives

This academic program will provide graduates with a specialized approach to Deep Neural Network Training in the area of Deep Learning. Students will incorporate to their daily procedures the most advanced techniques to correct gradient problems in their models. At the same time, experts will acquire technical skills to work with Deep Learning tools, among which Keras and TensorFlow stand out. Specialists will also be able to program aspects such as the learning rate, in order to obtain the best results in their projects.





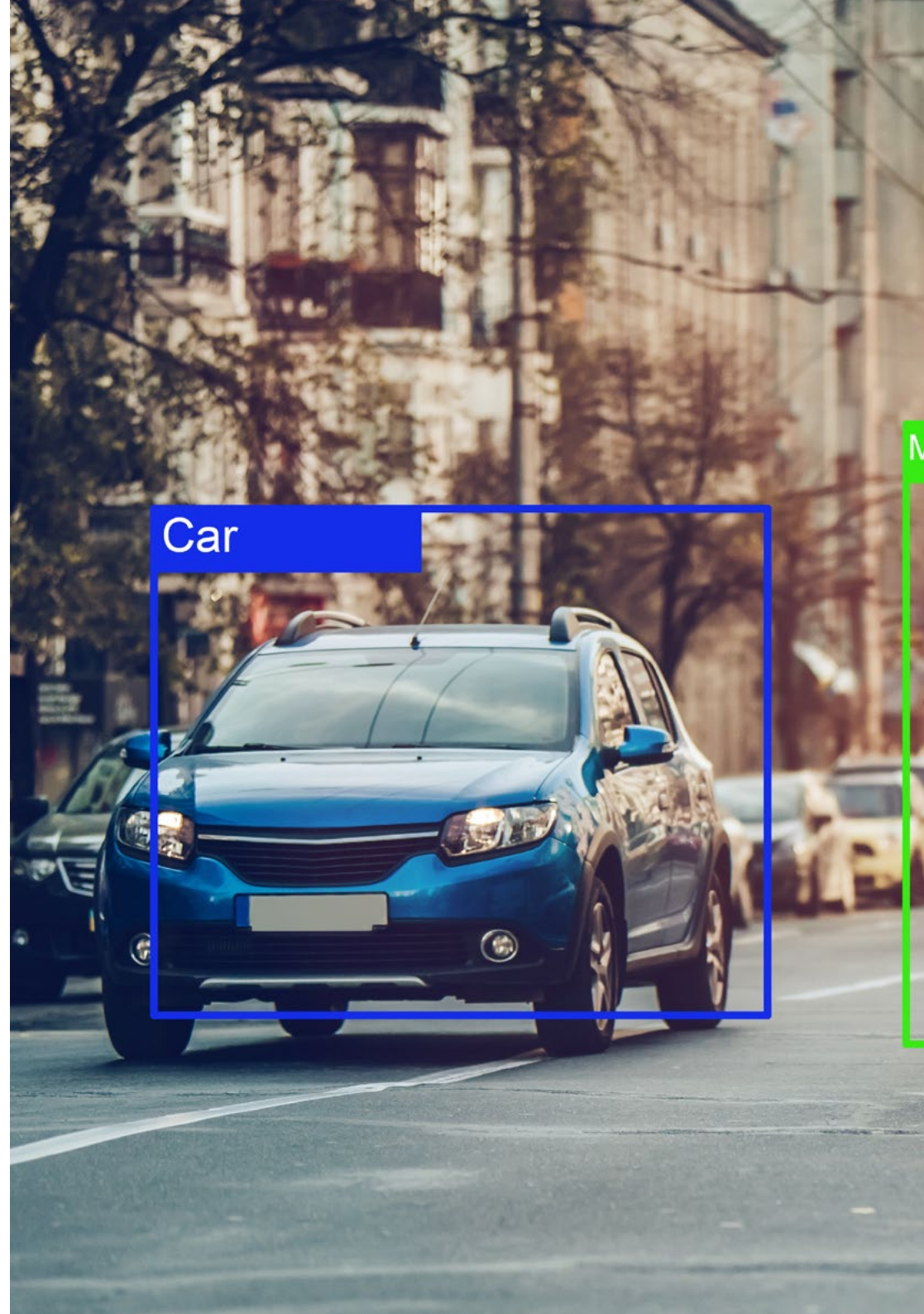
“

You will achieve your most ambitious professional goals thanks to this refresher program, which incorporates the most modern procedures for Synthetic Data Generation”



General Objectives

- Fundamentalize the key concepts of mathematical functions and their derivatives
- Apply these principles to deep learning algorithms to learn automatically
- Analyze the training, evaluation and analysis of neural network models
- Fundamentals of the key concepts and main applications of deep learning
- Implement and optimize neural networks with Keras
- Analyze the optimization and regularization mechanisms required for deep neural network training





Specific Objectives

- Address gradient problems and how they can be avoided
- Develop expertise in the training of deep neural networks
- Determine how to reuse pre-trained layers to train deep neural networks
- Establish how to schedule the learning rate to get the best results



Motorbike



Car

“

This program will allow you to update in a personalized way adapted to your needs and obligations. No fixed schedules!”

03

Course Management

In order to preserve the educational excellence that defines its university programs, TECH has a first class teaching staff for this Postgraduate Certificate in Deep Neural Network Training in Deep Learning.. These professionals are specialized in this technological field, with a wide working background in prestigious institutions. In this sense, they have provided innovative solutions to improve the performance of these companies and place them at the top. Therefore, students will enjoy an immersive learning experience under the guidance of true experts in this branch of Artificial Intelligence.





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An excellent teaching staff specialized in Deep Learning has designed this university program with a first-class theoretical and practical approach"

Management



Mr. Gil Contreras, Armando

- ♦ Lead Big Data Scientist at Johnson Controls
- ♦ Data Scientist-Big Data at Opensistemas S.A
- ♦ Fund Auditor at Creatividad and Tecnología (CYTSA)
- ♦ Public Sector Auditor at PricewaterhouseCoopers Auditors
- ♦ Master's Degree in Data Science from the Centro Universitario de Tecnología y Arte
- ♦ MBA in International Relations and Business from the Centro de Estudios Financieros (CEF)
- ♦ Bachelor's Degree in Economics from Instituto Tecnológico de Santo Domingo

Professors

Ms. Delgado Feliz, Benedit

- ♦ Administrative Assistant and Electronic Surveillance Operator for the National Drug Control Directorate (DNCD)
- ♦ Customer Service at Cáceres y Equipos
- ♦ Claims and Customer Service at Express Parcel Services (EPS)
- ♦ Microsoft Office Specialist at the National School of Informatics (Escuela Nacional de Informática)
- ♦ Social Communicator from the Catholic University of Santo Domingo

Ms. Gil de León, María

- ♦ Co-Director of Marketing and Secretary at RAÍZ Magazine
- ♦ Copy Editor at Gauge Magazine
- ♦ Stork Magazine reader from Emerson College
- ♦ B.A. in Writing, Literature and Publishing from Emerson College



Mr. Matos Rodríguez, Dionis

- ◆ Data Engineer at Wide Agency Sodexo
- ◆ Data Consultant at Tokiota
- ◆ Data Engineer at Devoteam
- ◆ BI Developer at Ibermática
- ◆ Applications Engineer at Johnson Controls
- ◆ Database Developer at Suncapital España
- ◆ Senior Web Developer at Deadlock Solutions
- ◆ QA Analyst at Metaconcept
- ◆ Master's Degree in Big Data & Analytics by EAE Business School
- ◆ Master's Degree in Systems Analysis and Design
- ◆ Bachelor's Degree in Computer Engineering from APEC University

Mr. Villar Valor, Javier

- ◆ Director and Founding Partner of Impulsa2
- ◆ Chief Operations Officer (COO) at Summa Insurance Brokers
- ◆ Director of Transformation and Operational Excellence at Johnson Controls
- ◆ Master in Professional Coaching
- ◆ Executive MBA from Emlyon Business School, France
- ◆ Master's Degree in Quality Management from EOI, Spain
- ◆ Computer Engineering from the Universidad Acción Pro-Education and Culture (UNAPEC)

04

Structure and Content

This program aims to provide students with a solid understanding of Deep Learning and to equip their praxis with the advances that have been made in Deep Neural Network Training. The program will address the most innovative techniques for both gradient optimization and weight initialization. In addition, the curriculum will delve into advanced Evaluation Metrics, aimed at measuring the performance of trained models on a variety of tasks. In addition, the teaching materials will focus on Transfer Learning, enabling graduates to improve efficiency in the use of data and computational resources.



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The university program includes case studies to bring you closer to the reality of the labor market, bearing in mind the revolution brought about by Deep Learning”

Module 1. Deep Neural Networks Training

- 1.1. Gradient Problems
 - 1.1.1. Gradient Optimization Techniques
 - 1.1.2. Stochastic Gradients
 - 1.1.3. Weight Initialization Techniques
- 1.2. Reuse of Pre-Trained Layers
 - 1.2.1. Learning Transfer Training
 - 1.2.2. Feature Extraction
 - 1.2.3. Deep Learning
- 1.3. Optimizers
 - 1.3.1. Stochastic Gradient Descent Optimizers
 - 1.3.2. Adam and RMSprop Optimizers
 - 1.3.3. Moment Optimizers
- 1.4. Learning Rate Programming
 - 1.4.1. Automatic Learning Rate Control
 - 1.4.2. Learning Cycles
 - 1.4.3. Smoothing Terms
- 1.5. Overfitting
 - 1.5.1. Cross Validation
 - 1.5.2. Regularization
 - 1.5.3. Evaluation Metrics
- 1.6. Practical Guidelines
 - 1.6.1. Model Design
 - 1.6.2. Selection of Metrics and Evaluation Parameters
 - 1.6.3. Hypothesis Testing
- 1.7. Transfer Learning
 - 1.7.1. Learning Transfer Training
 - 1.7.2. Feature Extraction
 - 1.7.3. Deep Learning



- 1.8. Data Augmentation
 - 1.8.1. Image Transformations
 - 1.8.2. Synthetic Data Generation
 - 1.8.3. Text Transformation
- 1.9. Practical Application of Transfer Learning
 - 1.9.1. Learning Transfer Training
 - 1.9.2. Feature Extraction
 - 1.9.3. Deep Learning
- 1.10. Regularization
 - 1.10.1. L1 and L2
 - 1.10.2. Regularization by Maximum Entropy
 - 1.10.3. Dropout

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You will have a library of learning resources available 24 hours a day to ensure that your learning is successful”

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.





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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 Training of Deep Neural Networks 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.





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

This **Postgraduate Certificate in Training of Deep Neural Networks 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 Training of Deep Neural Networks in Deep Learning**

Official N° of Hours: **150 h.**



*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.

future
health confidence people
education information tutors
guarantee accreditation teaching
institutions technology learning
community commitment
personalized service innovation
knowledge present
development languages
virtual classroom



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Postgraduate Certificate

Training of Deep Neural Networks in Deep Learning

