Postgraduate Certificate

Advanced Applications of Artificial Intelligence in Medical Imaging Studies and Analysis

tech global university

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Postgraduate Certificate

Advanced Applications of Artificial Intelligence in Medical Imaging Studies and Analysis

- Modality: **online**
- Duration: **6 weeks**
- Certificate: **TECH Global University**
- Accreditation: **6 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/us/medicine/postgraduate-certificate/advanced-applications-artificial-intelligence-medical-imaging-studies-analysis**

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Introduction

Advanced Artificial Intelligence applications are revolutionizing medical image analysis, enabling healthcare professionals to improve diagnostic accuracy and optimize clinical workflow. Therefore, this program analyzes the use of technologies, such as neural networks and Natural Language Processing (NLP) tools, to detect diseases early, improve the quality of diagnosis and automate reports. Through a hands-on approach, students will acquire advanced skills in the management of these technological innovations, preparing them to integrate AI into their daily clinical practice. In this sense, TECH has created a 100% online program that offers the flexibility to combine it with work and personal schedules.

Thanks to this 100% online Postgraduate Certificate, you will be able to contribute to the advancement of Medicine, applying innovative Artificial Intelligence solutions in the diagnosis of various pathologies"

Advanced applications of Artificial Intelligence in medical imaging are transforming the diagnosis and treatment of pathologies, from the early detection of Cancer with convolutional neural networks, to the identification of neurodegenerative diseases through the analysis of complex patterns in MRI and CT scans. In addition, AI makes it possible to prioritize critical cases in radiology, improve tumor segmentation, optimize image quality and predict the evolution of diseases.

In this sense, the academic itinerary contains an integral approach, thanks to which doctors will strengthen their knowledge in the design and execution of observational studies, applying Artificial Intelligence for the selection of populations, the control of variables and long-term follow-up. In addition, the validation and calibration of models will be studied, with tools such as Arterys Cardio AI, ensuring the accuracy of predictions in various clinical conditions.

During this program, professionals will also master methods of integrating medical imaging data with other biomedical sources, optimizing diagnoses through the fusion of clinical, genetic and laboratory information. Likewise, they will approach multidisciplinary use cases, applying deep learning algorithms specific to medical imaging and understanding the importance of interdisciplinary collaboration in advanced research. Finally, the syllabus will cover simulations and computational modeling for diagnostic imaging, highlighting the use of Virtual and Augmented Reality for image-guided surgical procedures.

In this way, this 100% online Postgraduate Certificate offers graduates the flexibility to take it in a comfortable way, in the place and time of their choice, only needing an electronic device with Internet access. It is a modality adapted to current needs, which guarantees to position students in a high demand sector, thanks to the revolutionary Relearning methodology, consisting in the repetition of key concepts for an optimal and organic assimilation of the contents.

This **Postgraduate Certificate in Advanced Applications of Artificial Intelligence in Medical Imaging Studies and Analysis** contains the most complete and up-to-date scientific program on the market. The most important features include:

- The development of practical cases presented by experts in Artificial Intelligence applied to Diagnostic Imaging
- The graphic, schematic and eminently practical contents with which it is conceived gather scientific and practical information on those disciplines that are indispensable 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

You will delve into the most advanced techniques in medical image analysis with the help of Artificial Intelligence, thanks to an extensive library of innovative multimedia resources"

With the Relearning methodology, healthcare professionals will combine the study of clinical cases with a learning system based on the continuous reiteration of key concepts"

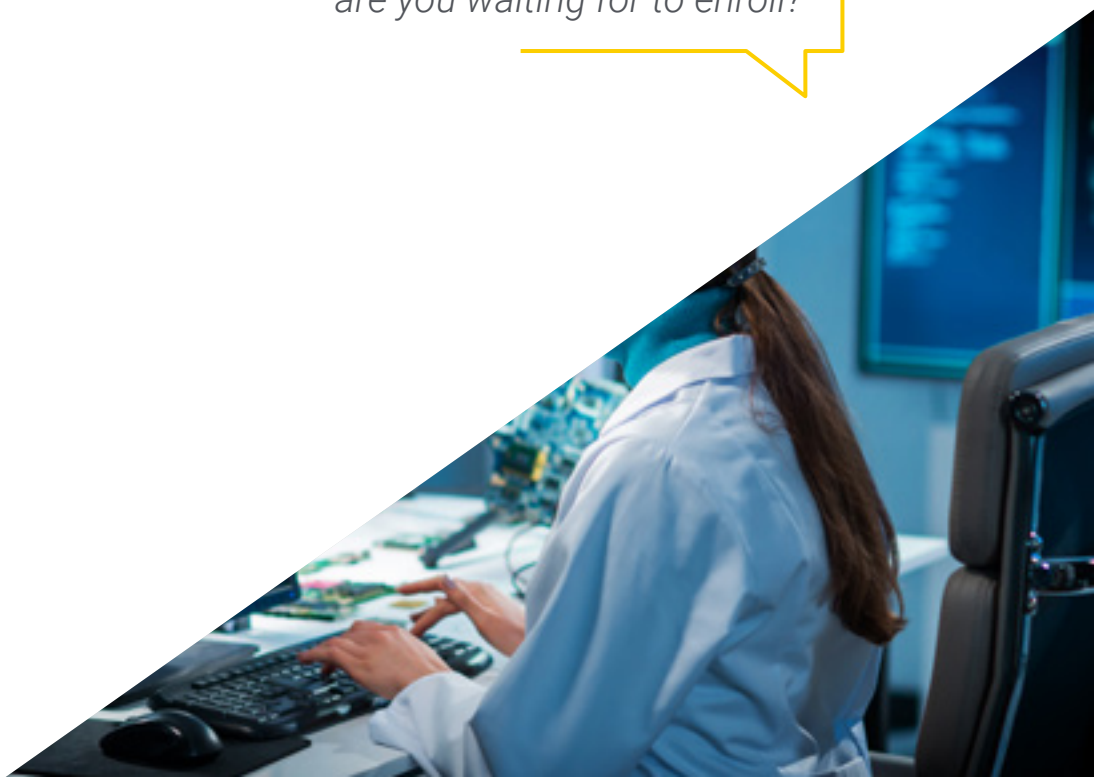
The program's teaching staff includes professionals from the sector who bring to this program the experience of their work, in addition to recognized specialists from prestigious reference societies and universities.

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 course. For this purpose, students will be assisted by an innovative interactive video system created by renowned and experienced experts.

You will cover topics such as image segmentation and classification, pathology detection, predictive model generation and the development of AI-assisted tools.

Become an expert in Artificial Intelligence and Medical Image Analysis by taking this Postgraduate Certificate from anywhere in the world and at any time of the day. What are you waiting for to enroll?



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Objectives

The main objective of this academic program is to offer graduates the most advanced and updated tools in the field of Medical Image Analysis through Artificial Intelligence. Therefore, health professionals will be able to apply machine learning algorithms and neural networks to improve diagnosis and clinical decision making. Likewise, a deep understanding of image processing technologies will be fostered, optimizing their use in early disease detection, pathology classification and predictive analysis.

Update your daily clinical practice in image analysis, thanks to the objectives set by TECH and the best didactic materials in the academic market, which are at the technological and educational forefront"

General Objectives

- Understand the theoretical foundations of Artificial Intelligence
- Study the different types of data and understand the data life cycle
- Evaluate the crucial role of data in the development and implementation of AI solutions
- Delve into algorithms and complexity to solve specific problems
- Explore the theoretical basis of neural networks for Deep Learning development
- Explore bio-inspired computing and its relevance in the development of intelligent systems
- Develop skills to use and apply advanced Artificial Intelligence tools in the interpretation and analysis of medical images, improving diagnostic accuracy
- Implement Artificial Intelligence solutions that allow the automation of processes and the personalization of diagnostics
- Apply Data Mining and Predictive Analytics techniques to make evidence-based clinical decisions
- Acquire research skills that allow experts to contribute to the advancement of Artificial Intelligence in medical imaging

Specific Objectives

- Execute observational studies in imaging using Artificial Intelligence, validating and calibrating the models efficiently
- Integrate medical imaging data with other biomedical sources, using tools such as Enlitic Curie to conduct multidisciplinary research

You define your goals and TECH provides you with the best plan to achieve them! Join the extensive community of professionals who have chosen this institution and take the next step towards your future"

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Course Management

TECH has carefully selected the teaching team of this program to ensure high quality specialization, which provides physicians with a comprehensive and competitive preparation in the labor market. Therefore, leading experts in the field of Artificial Intelligence and its application in Medical Image Analysis will guide students through the key aspects of this technology. In addition, graduates will be able to hone their skills by learning about the current demands of the sector, standing out in a constantly evolving environment.

This TECH Postgraduate Certificate will give you the unique opportunity to specialize with the most prominent experts in the field of Medical Image Analysis using Artificial Intelligence"

Management

Dr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometeus Global Solutions
- CTO at Korporate Technologies
- CTO at AI Shephers GmbH
- Consultant and Strategic Business Advisor at Alliance Medical
- Director of Design and Development at DocPath
- PhD. in Psychology from the University of Castilla La Mancha
- PhD in Economics, Business and Finance from the Camilo José Cela University
- PhD in Psychology from University of Castilla La Mancha
- Máster in Executive MBA por la Universidad Isabel I
- Master's Degree in Sales and Marketing Management, Isabel I University
- Expert Master's Degree in Big Data by Hadoop Training
- Master's Degree in Advanced Information Technologies from the University of Castilla La Mancha
- Member of: SMILE Research Group

Professors

Mr. Popescu Radu, Daniel Vasile

- Independent Specialist in Pharmacology, Nutrition and Dietetics
- Freelance Producer of Teaching and Scientific Content
- Nutritionist and Community Dietitian
- Community Pharmacist
- Researcher
- Master's Degree in Nutrition and Health at the Open University of Catalonia
- Master's Degree in Psychopharmacology from the University of Valencia
- Pharmacist from the Complutense University of Madrid
- Nutritionist-Dietitian by the European University Miguel de Cervantes

Take the opportunity to learn about the latest advances in this field in order to apply it to your daily practice"

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Structure and Content

This Postgraduate Certificate will include an introduction to fundamental concepts of Artificial Intelligence and machine learning, with a particular focus on Convolutional Neural Networks (CNN) and their application in detection, segmentation and classification of medical images. In addition, image processing techniques, AI-assisted diagnosis and the use of advanced Deep Learning tools will be analyzed. In this way, professionals will acquire practical skills through the use of specialized software, preparing them to face the current challenges in the field of automated medical analysis.

Get up to date on the latest developments offered by Artificial Intelligence in the area of Medicine, thanks to this comprehensive syllabus validated by the best digital university in the world, according to Forbes: TECH"

Module 1. Advanced Applications of Artificial Intelligence in Medical Imaging Studies and Analysis

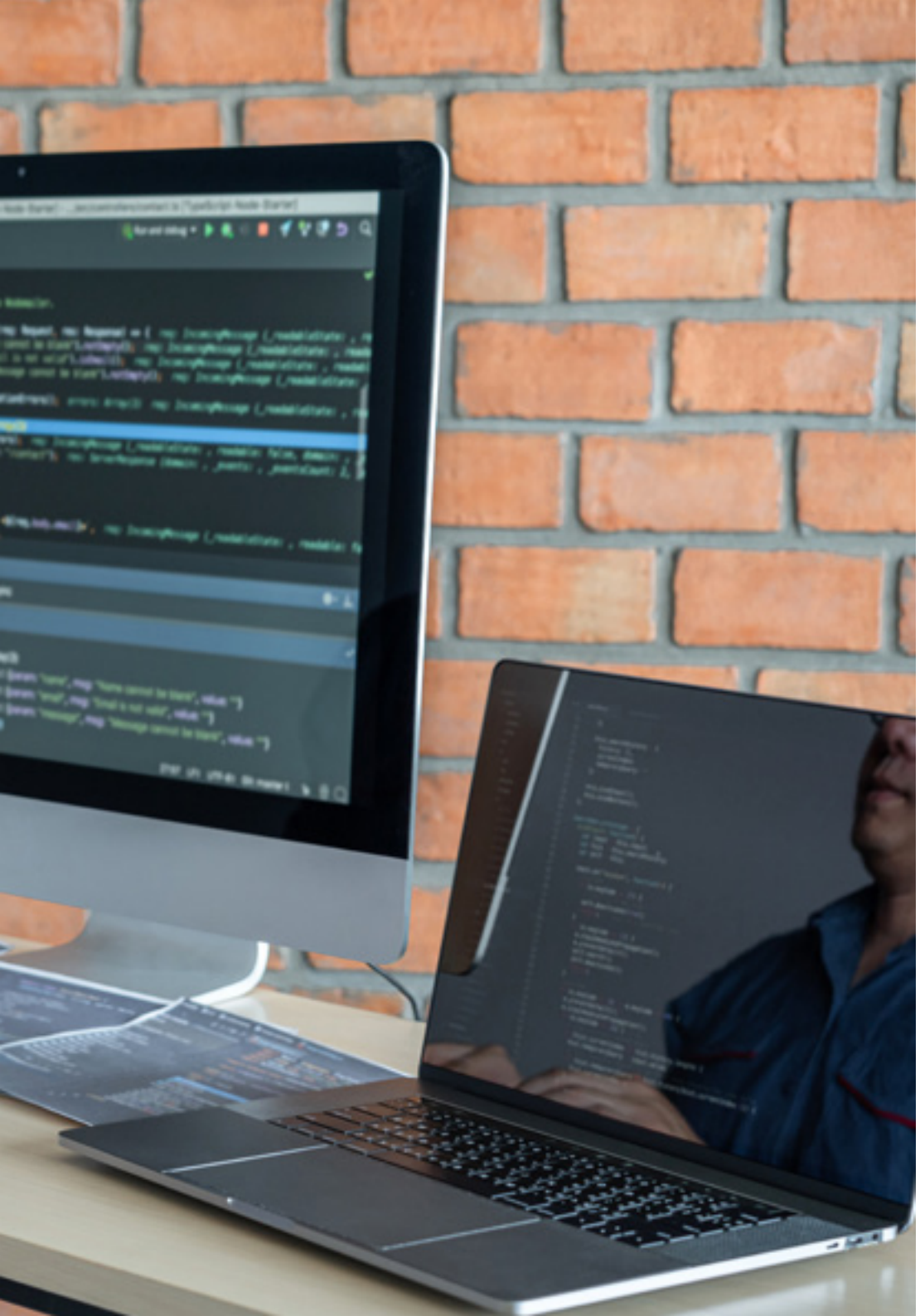
1.1. Design and Execution of Observational Studies using Artificial Intelligence in Medical Imaging with Flatiron Health
- 1.1.1. Criteria for the Selection of Populations in Artificial Intelligence Observational Studies
- 1.1.2. Methods for Controlling Confounding Variables in Imaging Studies
- 1.1.3. Strategies for Long-Term Follow-Up in Observational Studies
- 1.1.4. Analysis of Results and Validation of Artificial Intelligence Models in Real Clinical Settings

1.2. Validation and Calibration of AI Models in Image Interpretation with Arterys Cardio AI
- 1.2.1. Cross-Validation Techniques Applied to Diagnostic Imaging Models
- 1.2.2. Methods for Probability Calibration in AI Predictions
- 1.2.3. Performance Standards and Accuracy Metrics for AI Evaluation
- 1.2.4. Implementation of Robustness Testing in Different Populations and Conditions

1.3. Methods of Integrating Imaging Data with other Biomedical Sources
- 1.3.1. Data Fusion Techniques to Improve Image Interpretation
- 1.3.2. Joint Analysis of Images and Genomic Data for Accurate Diagnoses
- 1.3.3. Integration of Clinical and Laboratory Information in Artificial Intelligence Systems
- 1.3.4. Development of User Interfaces for Integrated Visualization of Multidisciplinary Data

1.4. Use of Medical Imaging Data in Multidisciplinary Research with Enlitic Curie
- 1.4.1. Interdisciplinary Collaboration for Advanced Image Analysis
- 1.4.2. Application of Artificial Intelligence Techniques from other Fields in Diagnostic Imaging
- 1.4.3. Challenges and Solutions in the Management of Large and Heterogeneous Data
- 1.4.4. Case Studies of Successful Multidisciplinary Applications

1.5. Specific Deep Learning Algorithms for Medical Imaging with Aidoc
- 1.5.1. Development of Image-Specific Neural Network Architectures
- 1.5.2. Optimization of Hyperparameters for Medical Imaging Models
- 1.5.3. Transfer of Learning and its Applicability in Radiology



1.6. Challenges in the Interpretation and Visualization of Features Learned by Deep Models
- 1.6.1. Optimization of the Interpretation of Medical Images by Automation with Viz.ai
- 1.6.2. Automation of Diagnostic Routines for Operational Efficiency
- 1.6.3. Early Warning Systems for Anomaly Detection
- 1.6.4. Reduction of Radiologists' Workload by Means of Artificial Intelligence Tools
- 1.6.5. Impact of Automation on the Accuracy and Speed of Diagnostics

1.7. Simulation and Computational Modeling in Diagnostic Imaging
- 1.7.1. Simulations for Training and Validation of Artificial Intelligence Algorithms
- 1.7.2. Modeling of Diseases and their Representation in Synthetic Images
- 1.7.3. Use of Simulations for Treatment and Surgery Planning
- 1.7.4. Advances in Computational Techniques for Real-Time Image Processing

1.8. Virtual and Augmented Reality in Medical Image Visualization and Analysis
- 1.8.1. Virtual Reality Applications for Diagnostic Imaging Education
- 1.8.2. Use of Augmented Reality in Image-Guided Surgical Procedures
- 1.8.3. Advanced Visualization Tools for Therapeutic Planning
- 1.8.4. Development of Immersive Interfaces for the Review of Radiological Studies

1.9. Data Mining Tools Applied to Diagnostic Imaging with Radiomics
- 1.9.1. Techniques for Data Mining of Large Medical Image Repositories
- 1.9.2. Pattern Analysis Applications for Image Data Collections
- 1.9.3. Biomarker Identification through Image Data Mining
- 1.9.4. Integration of Data Mining and Machine Learning for Clinical Discovery

1.10. Development and Validation of Biomarkers using Image Analysis with Oncimmune
- 1.10.1. Strategies to Identify Imaging Biomarkers in Various Diseases
- 1.10.2. Clinical Validation of Imaging Biomarkers for Diagnostic Use
- 1.10.3. Impact of Imaging Biomarkers on Treatment Personalization
- 1.10.4. Emerging Technologies in the Detection and Analysis of Biomarkers through Artificial Intelligence

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"

At TECH we use the Case Method

What should a professional do in a given situation? Throughout the program, students will face multiple simulated clinical cases, based on real patients, in which they will have to do research, establish hypotheses, and ultimately resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world.

According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, trying to recreate the real conditions in the physician's professional practice.

Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method"

The effectiveness of the method is justified by four fundamental achievements:

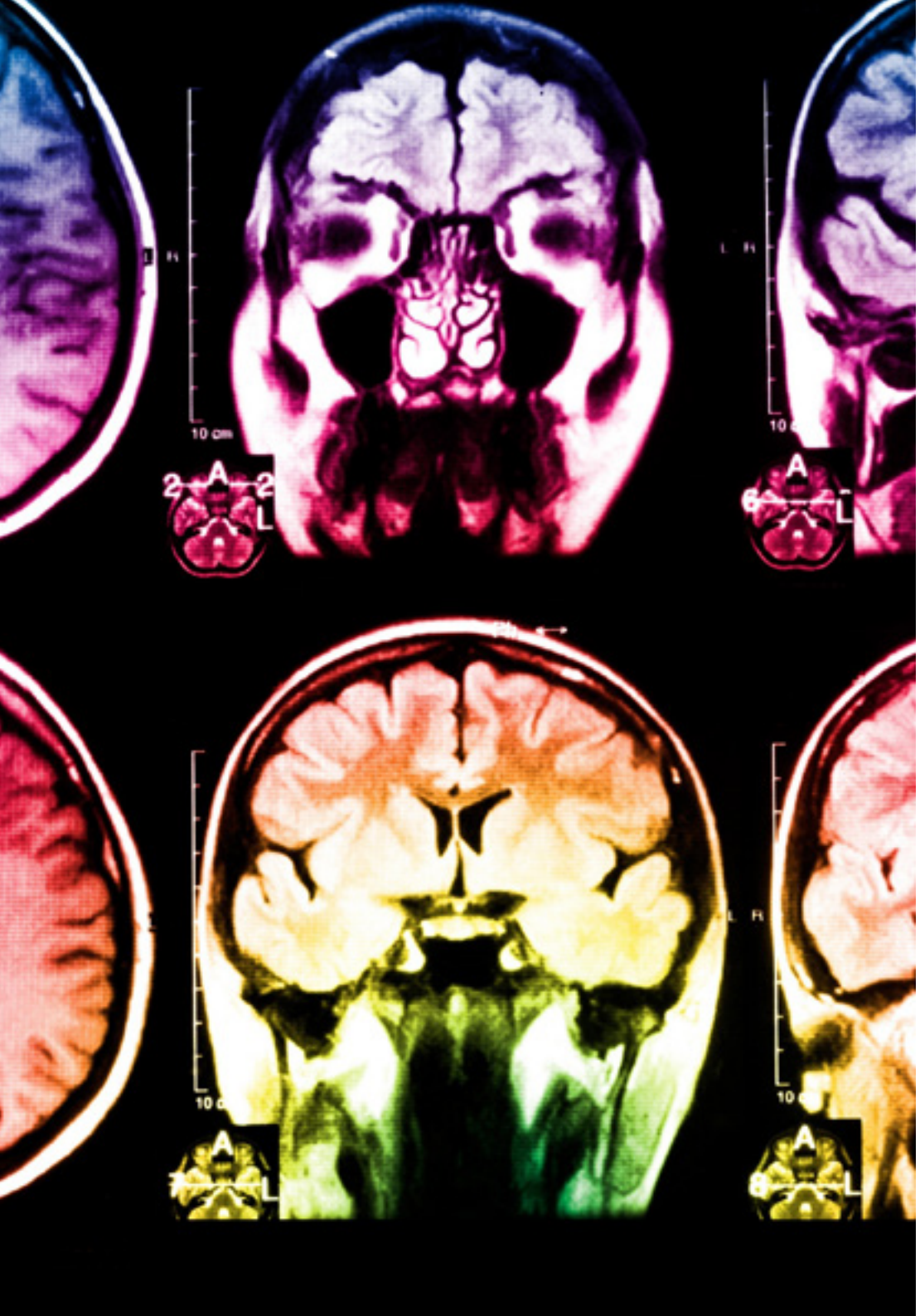
1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.

Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

Professionals will learn through real cases and by resolving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.



At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology, more than 250,000 physicians have been trained with unprecedented success in all clinical specialties regardless of surgical load. Our pedagogical methodology is developed in a highly competitive environment, with a university student body with a strong socioeconomic profile and an average age of 43.5 years old.

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

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.

The overall score obtained by TECH's learning system is 8.01, according to the highest international standards.

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.

Surgical Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and to the forefront of current medical techniques. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch the videos as many times as you like.

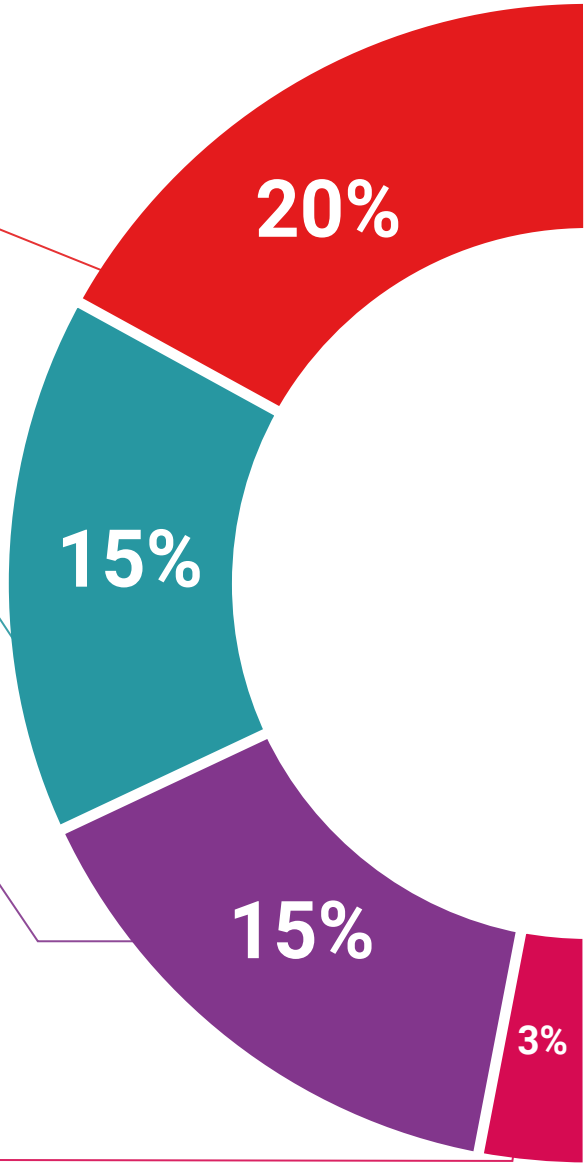
Interactive Summaries

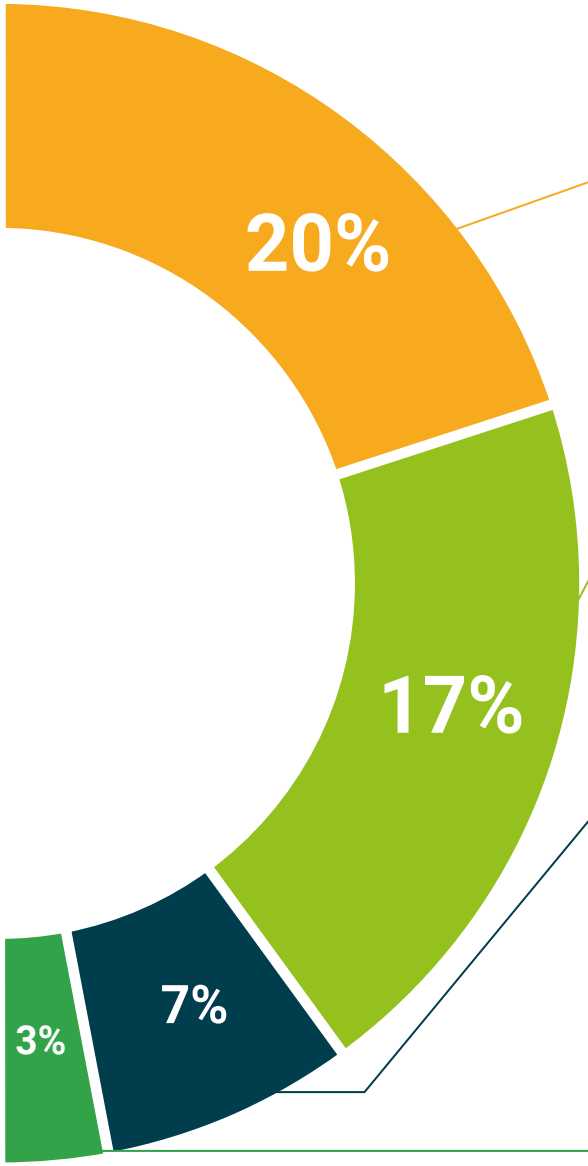
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".

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.





Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.

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.

Classes

There is scientific evidence on the usefulness of learning by observing experts. The system known as Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

Quick Action Guides

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help students progress in their learning.

06

Certificate

The Postgraduate Certificate in Advanced Applications of Artificial Intelligence in Medical Imaging Studies and Analysis guarantees, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.

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

This private qualification will allow you to obtain a **Postgraduate Certificate in Advanced Applications of Artificial Intelligence in Medical Imaging Studies and Analysis** 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.

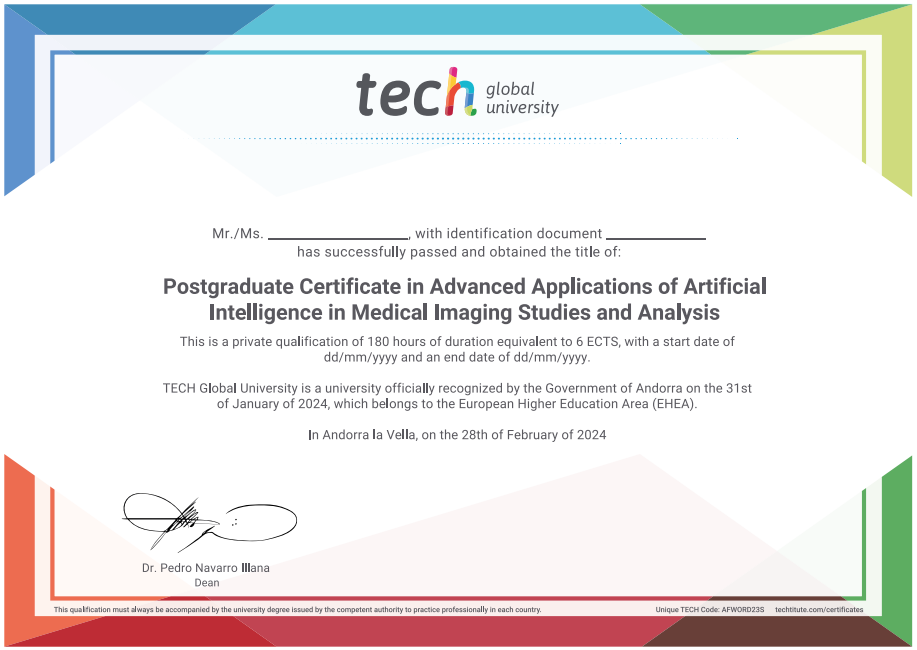
This **TECH Global University** private qualification is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Advanced Applications of Artificial Intelligence in Medical Imaging Studies and Analysis**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**


tech global university

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

Postgraduate Certificate in Advanced Applications of Artificial Intelligence in Medical Imaging Studies and Analysis

This is a private qualification of 180 hours of duration equivalent to 6 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
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 Global University will make the necessary arrangements to obtain it, at an additional cost.

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