

Postgraduate Certificate

Big Data and Predictive Analytics in Medical Imaging



Postgraduate Certificate Big Data and Predictive Analytics in Medical Imaging

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

Website: www.techtute.com/medicina/curso-universitario/big-data-analisis-predictivo-imagenologia-medica

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01

Introduction

The use of Big Data and Predictive Analytics in Medical Imaging is transforming the diagnosis and treatment of various pathologies. In fact, these technologies make it possible to process large volumes of data, including medical images and genetic profiles, to identify complex patterns that optimize diagnostic accuracy. In addition, the use of AI applied in this field facilitates the personalization of medical treatments, adjusting them to the individual characteristics of each patient. In this context, TECH has developed a comprehensive and 100% online program, which will adapt perfectly to the personal and work schedules of students, avoiding problems such as traveling to a physical center and adapting to a pre-established schedule. It will also be based on the innovative learning methodology known as Relearning.





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This 100% online program will offer you the latest developments in Big Data and Predictive Analytics in Medical Imaging, allowing you to understand its key elements and its effectiveness in the identification of serious pathologies”

The advancement of Big Data in the field of medical image analysis is revolutionizing clinical diagnostics and personalized care. Indeed, the integration of large volumes of data from medical images and other clinical records allows physicians to identify complex patterns related to diseases.

This Postgraduate Certificate has been specifically designed for healthcare professionals looking to update their knowledge in the use of advanced data processing tools and Artificial Intelligence models applied to the early detection of diseases. Therefore, they will address the key concepts and the most advanced tools, such as GE Healthcare Edison, for handling large volumes of data. In addition, they will delve into the challenges and strategies for integrating Big Data into diagnostic imaging, analyzing case studies that demonstrate the effectiveness of these technologies in the medical field.

Data mining techniques in biomedical imaging records will also be examined, employing platforms such as IBM Watson Imaging to optimize clinical decision making by extracting valuable information. In this sense, professionals will master the most advanced methods to identify patterns in image databases, applying classification and clustering techniques to improve diagnoses and treatments.

Finally, machine learning algorithms in image analysis will be addressed, using Google DeepMind Health innovations, as well as the development of supervised and unsupervised algorithms for the identification of disease patterns. Deep learning applications in medical image segmentation and classification will also be covered.

In this way, TECH presents a 100% online university program, which will offer graduates the flexibility to study it from any place and at any time they wish, since it will only be necessary to have an electronic device connected to the Internet. Additionally, the revolutionary Relearning methodology will be used, that is, the repetition of key content for its effective assimilation.

This **Postgraduate Certificate in Big Data and Predictive Analytics in Medical Imaging** 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 medicine for the diagnosis of severe pathologies
- ♦ 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



Enroll now in this innovative academic program! You will be specialized in the use of advanced tools for the analysis of large volumes of data in the field of health"

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You will tackle computational models that simulate biological networks visible in images, allowing you to better understand pathologies and develop personalized therapies. With all the TECH quality guarantees!"

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

You will use machine learning algorithms applied to medical imaging, with tools such as Google DeepMind Health, through the best teaching materials, at the forefront of technology and education.

Become an expert healthcare professional in the use of predictive analytics in medical imaging, thanks to an extensive library of innovative multimedia resources.



02 Objectives

Becoming one of the best healthcare professionals requires being constantly updated, especially in the use of the most advanced models of predictive analysis in medical imaging. With this commitment, TECH offers a program designed for graduates to complement their career with the latest innovations in Big Data applied to the healthcare field. Therefore, the main objectives of the program will include the development of skills in the creation of predictive models, improving diagnostic accuracy. In addition, the regulations and standards for the interoperability of health data will be studied in depth, guaranteeing its responsible use.





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The main objective of this Postgraduate Certificate will be to offer you a comprehensive and updated specialization, to process and analyze large volumes of information from imaging studies, such as CT and MRI”



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

- Manage large volumes of data using Data Mining techniques and Machine Learning algorithms
- Create clinical prognostic tools based on Big Data analysis in order to optimize clinical decisions



Achieve your professional goals with TECH! You will develop advanced skills in the applications of clustering techniques, as well as classification in image logs."

03

Course Management

One of TECH's priorities when designing its programs is to have a highly qualified teaching team that guarantees both the quality and rigor of the academic development. For this Postgraduate Certificate, a group of experts in the medical sector has been selected to provide their knowledge to guide health professionals. In addition, the faculty includes specialists in Big Data and Predictive Analytics, which ensures a close and practical qualification, with real cases that will allow students to face various situations that may arise in their professional environment.





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Complement your knowledge with the best professionals in the field of Medicine and Artificial Intelligence, who will guide you in the complex field of Big Data and Predictive Analytics in Medical Imaging”

Management



Dr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometheus 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

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

04

Structure and Content

This Postgraduate Certificate, designed by TECH and its teaching team, incorporates the latest developments in the medical sector in the area of Big Data applied to medical imaging. In this way, throughout this academic itinerary, health professionals will analyze the latest innovations in machine learning techniques for the recognition of disease patterns. In addition, with completely updated information, quality control in the evaluation of the efficacy and accuracy of machine learning algorithms in clinical studies, therefore optimizing the results in medical practice.



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This study plan will prepare you to deal with Artificial Intelligence models in Epidemiology, so you can update your professional profile, hand in hand with the best digital university in the world, according to Forbes: TECH”

Module 1. Big Data and Predictive Analytics in Medical Imaging

- 1.1. Big Data in Diagnostic Imaging: Concepts and Tools with GE Healthcare Edison
 - 1.1.1. Fundamentals of Big Data Applied to Imaging
 - 1.1.2. Technological Tools and Platforms for Handling Large Volumes of Imaging Data
 - 1.1.3. Challenges in the Integration and Analysis of Big Data in Imaging
 - 1.1.4. Use Cases of Big Data in Diagnostic Imaging
- 1.2. Data Mining in Biomedical Image Registries with IBM Watson Imaging
 - 1.2.1. Advanced Data Mining Techniques to Identify Patterns in Medical Images
 - 1.2.2. Strategies for Extracting Relevant Features in Large Image Databases
 - 1.2.3. Applications of Clustering and Classification Techniques in Image Registries
 - 1.2.4. Impact of Data Mining on Improving Diagnosis and Treatment
- 1.3. Machine Learning Algorithms in Image Analysis with Google DeepMind Health
 - 1.3.1. Development of Supervised and Unsupervised Algorithms for Medical Imaging
 - 1.3.2. Innovations in Machine Learning Techniques for Recognition of Disease Patterns
 - 1.3.3. Applications of Deep Learning in Image Segmentation and Classification
 - 1.3.4. Evaluation of the Efficacy and Accuracy of Machine Learning Algorithms in Clinical Studies
- 1.4. Predictive Analytics Techniques Applied to Diagnostic Imaging with Predictive Oncology
 - 1.4.1. Predictive Models for the Early Identification of Diseases from Images
 - 1.4.2. Use of Predictive Analytics for Monitoring and Treatment Evaluation
 - 1.4.3. Integration of Clinical and Imaging Data to Enrich Predictive Models
 - 1.4.4. Challenges in the Implementation of Predictive Techniques in Clinical Practice
- 1.5. Image-Based Artificial Intelligence Models for Epidemiology with BlueDot
 - 1.5.1. Application of Artificial Intelligence in the Analysis of Epidemic Outbreaks Using Images
 - 1.5.2. Models of Disease Spread Visualized by Imaging Techniques
 - 1.5.3. Correlation Between Epidemiological Data and Imaging Findings
 - 1.5.4. Contribution of Artificial Intelligence to the Study and Control of Pandemics
- 1.6. Analysis of Biological Networks and Disease Patterns from Images
 - 1.6.1. Application of Network Theory in the Analysis of Images to Understand Pathologies
 - 1.6.2. Computational Models to Simulate Biological Networks Visible in Images
 - 1.6.3. Integration of Image Analysis and Molecular Data for Mapping Diseases
 - 1.6.4. Impact of these Analyses on the Development of Personal Therapies



- 1.7. Development of Image-Based Tools for Clinical Prognosis
 - 1.7.1. Artificial Intelligence Tools for the Prediction of Clinical Course from Diagnostic Images
 - 1.7.2. Advances in the Generation of Automated Prognostic Reports
 - 1.7.3. Integration of Prognostic Models in Clinical Systems
 - 1.7.4. Validation and Clinical Acceptance of AI-Based Prognostic Tools
- 1.8. Advanced Visualization and Communication of Complex Data with Tableau
 - 1.8.1. Visualization Techniques for the Multidimensional Representation of Image Data
 - 1.8.2. Interactive Tools for the Exploration of Large Image Datasets
 - 1.8.3. Strategies for Effective Communication of Complex Findings Through Visualizations
 - 1.8.4. Impact of Advanced Visualization on Medical Education and Decision Making
- 1.9. Data Security and Challenges in Big Data Management
 - 1.9.1. Security Measures to Protect Large Volumes of Medical Imaging Data
 - 1.9.2. Challenges in Privacy and Ethics of Large-Scale Image Data Management
 - 1.9.3. Technological Solutions for the Secure Management of Healthcare Big Data
 - 1.9.4. Case Studies on Security Breaches and how they Were Addressed
- 1.10. Practical Applications and Case Studies on Biomedical Big Data
 - 1.10.1. Examples of Successful Applications of Big Data in the Diagnosis and Treatment of Diseases
 - 1.10.2. Case Studies on the Integration of Big Data in Healthcare Systems
 - 1.10.3. Lessons Learned from Big Data Projects in the Biomedical Field
 - 1.10.4. Future Directions and Potentials of Big Data in Medicine



Discover how the integration of Big Data in healthcare systems can strengthen the efficiency and accuracy of your diagnoses, always with the support of the revolutionary Relearning learning methodology”

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.



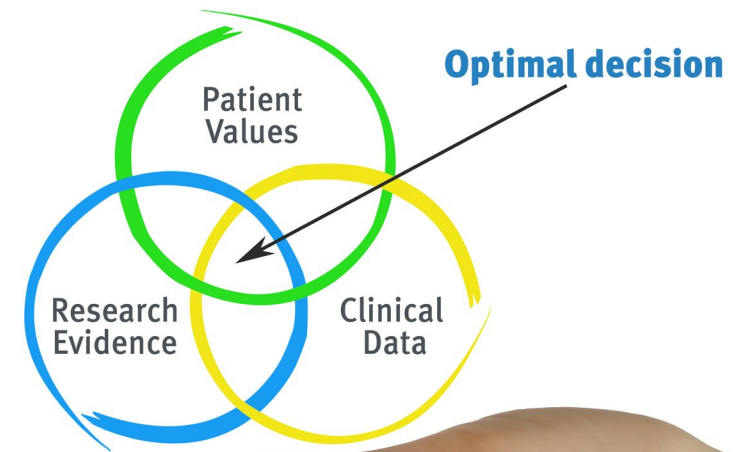
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Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

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. Gervas, 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.

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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 Big Data and Predictive Analytics in Medical Imaging guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Global University.



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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 Big Data and Predictive Analytics in Medical Imaging** 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.

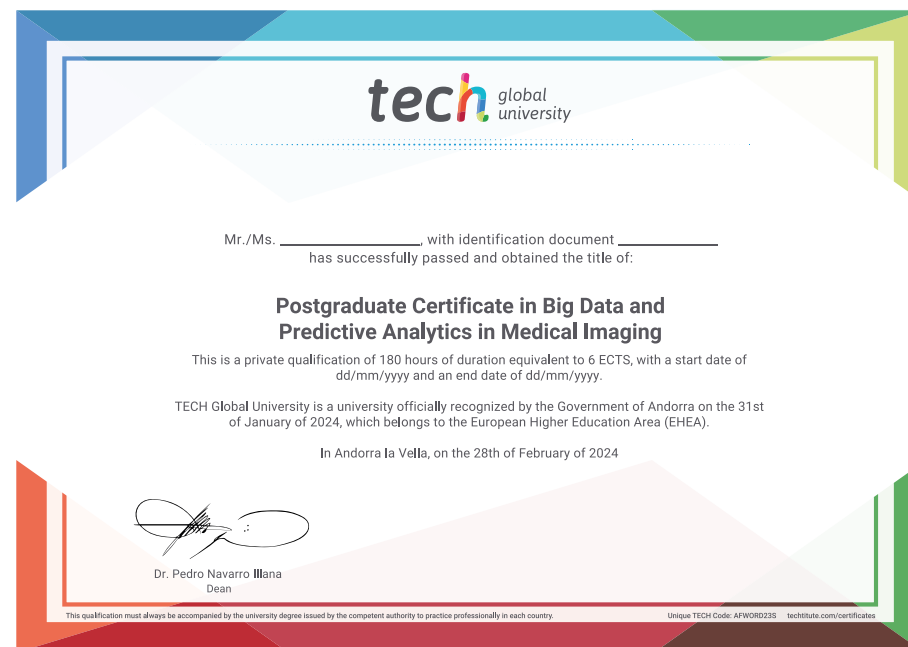
This **TECH Global University** private qualification is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Big Data and Predictive Analytics in Medical Imaging**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



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



Postgraduate Certificate
Big Data and Predictive
Analytics in Medical Imaging

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Postgraduate Certificate

Big Data and Predictive Analytics in Medical Imaging