Professional Master's Degree

Artificial Intelligence in Aesthetic Medicine

tech global university

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Professional Master's Degree
Artificial Intelligence in Aesthetic Medicine

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Accreditation: **90 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/us/artificial-intelligence/professional-master-degree/master-artificial-intelligence-aesthetic-medicine**

Index

01

Introduction to the Program

The implementation of Artificial Intelligence in Aesthetic Medicine is emerging as an innovative tool, allowing specialists to optimize the efficiency of procedures applied to patients. For example, in treatments such as the injection of dermal fillers or botulinum toxin, intelligent systems can help determine the exact amount of product to use in each muscle and predict the best application technique for each muscle. In this scenario, practitioners need to acquire advanced skills to effectively handle the main machine learning techniques to maximize the quality of clinical outcomes. With this idea in mind, TECH launches a cutting-edge university program focused on Artificial Intelligence in Aesthetic Medicine.

With this 100% online Professional Master's Degree, you will handle the most innovative Artificial Intelligence techniques to design personalized aesthetic treatment plans"

In the field of Aesthetic Medicine, Artificial Intelligence can analyze images of the skin and other physical aspects of the patient for a more accurate assessment of problems such as wrinkles, blemishes or signs of aging. This not only speeds up the diagnostic process, but also reduces the possibility of human error, ensuring that patients receive the right treatment from the start. Faced with this, specialists require a comprehensive understanding of the applications of intelligent systems to improve the accuracy of their aesthetic procedures.

In this context, TECH presents an innovative Professional Master's Degree in Artificial Intelligence in Aesthetic Medicine. Conceived by true references in this field, the curriculum will delve into issues ranging from the life cycle of data or sophisticated techniques for the interpretation of large volumes of information to the application of algorithms using state-of-the-art software. At the same time, the syllabus will offer experts multiple strategies to carry out comprehensive diagnoses of conditions such as precancerous lesions, melanomas or acne using neural networks and even artificial vision. Also, the teaching materials will delve into the use of various technological tools to provide individuals with an optimal clinical follow-up of post-treatment in real time.

On the other hand, this university program is based on a 100% online format, easily accessible from any device with an Internet connection and without predetermined schedules. In turn, TECH employs its disruptive Relearning teaching method, so that professionals can delve deeper into the contents without resorting to techniques that involve extra effort, such as memorization. In this sense, all professionals will need is an electronic device with Internet access (such as a cell phone, tablet or computer) to access the most complete teaching materials on the market and enjoy a first-class experience.

This **Professional Master's Degree in Artificial Intelligence in Aesthetic Medicine** contains the most complete and up-to-date university program on the market. Its most notable features are:

- The development of case studies presented by experts in Artificial Intelligence applied to Aesthetic Medicine
- The graphic, schematic and practical contents with which it is conceived provide scientific and practical information on those disciplines that are essential for professional practice
- Practical exercises where self-assessment can be used 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 master AI-based software for the analysis and treatment of a variety of aesthetic imperfections"

You will delve into the collection, analysis and protection of user data from Artificial Intelligence"

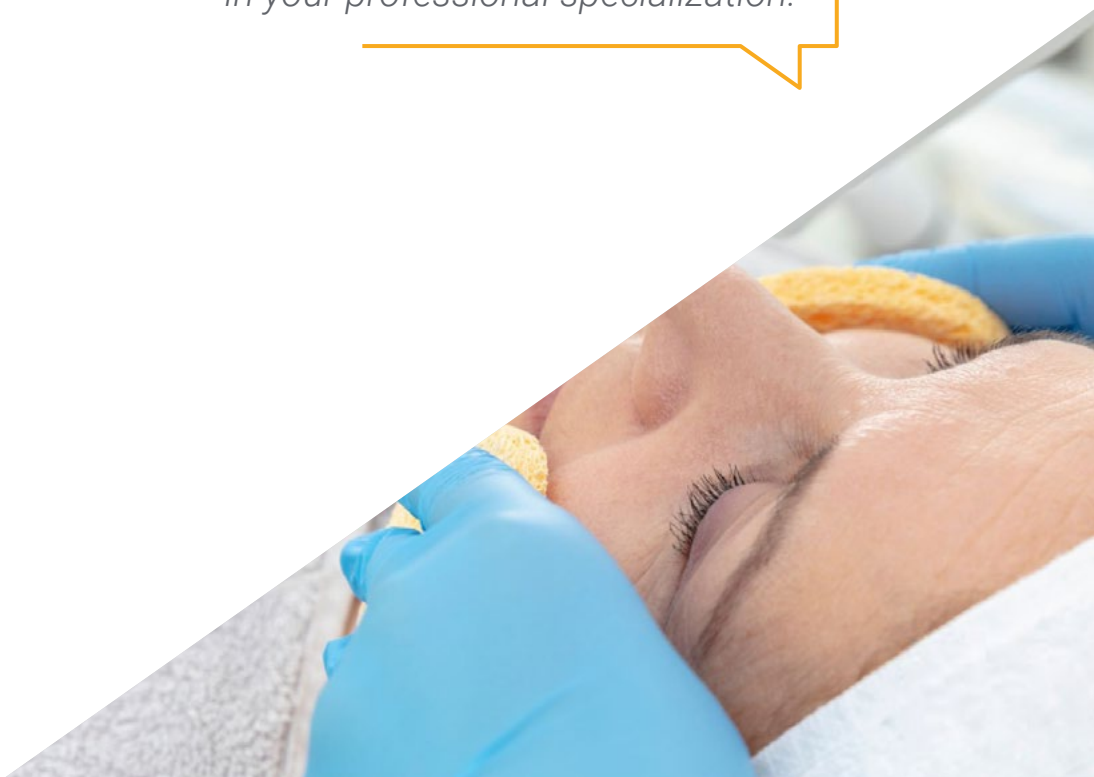
You will use algorithms to predict results, adjust techniques and improve the safety of aesthetic procedures.

TECH's exclusive Relearning system will allow you to learn with less effort and more performance, involving you more in your professional specialization.

The program's teaching staff includes professionals from the sector who contribute their work experience to this training 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 experts.



02

Why Study at TECH?

TECH is the world's largest online university. With an impressive catalog of more than 14,000 university programs, available in 11 languages, it is positioned as a leader in employability, with a 99% job placement rate. In addition, it has a huge faculty of more than 6,000 professors of the highest international prestige.

Study at the largest online university in the world and ensure your professional success. The future begins at TECH”

The world's best online university, according to FORBES

The prestigious Forbes magazine, specialized in business and finance, has highlighted TECH as "the best online university in the world" This is what they have recently stated in an article in their digital edition in which they echo the success story of this institution, "thanks to the academic offer it provides, the selection of its teaching staff, and an innovative learning method oriented to form the professionals of the future".

The best top international faculty

TECH's faculty is made up of more than 6,000 professors of the highest international prestige. Professors, researchers and top executives of multinational companies, including Isaiah Covington, performance coach of the Boston Celtics; Magda Romanska, principal investigator at Harvard MetaLAB; Ignacio Wistumba, chairman of the department of translational molecular pathology at MD Anderson Cancer Center; and D.W. Pine, creative director of TIME magazine, among others.

The world's largest online university

TECH is the world's largest online university. We are the largest educational institution, with the best and widest digital educational catalog, one hundred percent online and covering most areas of knowledge. We offer the largest selection of our own degrees and accredited online undergraduate and postgraduate degrees. In total, more than 14,000 university programs, in ten different languages, making us the largest educational institution in the world.

The most complete syllabuses on the university scene

TECH offers the most complete syllabuses on the university scene, with programs that cover fundamental concepts and, at the same time, the main scientific advances in their specific scientific areas. In addition, these programs are continuously updated to guarantee students the academic vanguard and the most demanded professional skills. and the most in-demand professional competencies. In this way, the university's qualifications provide its graduates with a significant advantage to propel their careers to success.

A unique learning method

TECH is the first university to use Relearning in all its programs. This is the best online learning methodology, accredited with international teaching quality certifications, provided by prestigious educational agencies. In addition, this innovative academic model is complemented by the "Case Method", thereby configuring a unique online teaching strategy. Innovative teaching resources are also implemented, including detailed videos, infographics and interactive summaries.

The official online university of the NBA

TECH is the official online university of the NBA. Thanks to our agreement with the biggest league in basketball, we offer our students exclusive university programs, as well as a wide variety of educational resources focused on the business of the league and other areas of the sports industry. Each program is made up of a uniquely designed syllabus and features exceptional guest hosts: professionals with a distinguished sports background who will offer their expertise on the most relevant topics.

Leaders in employability

TECH has become the leading university in employability. Ninety-nine percent of its students obtain jobs in the academic field they have studied within one year of completing any of the university's programs. A similar number achieve immediate career enhancement. All this thanks to a study methodology that bases its effectiveness on the acquisition of practical skills, which are absolutely necessary for professional development.

Google Premier Partner

The American technology giant has awarded TECH the Google Premier Partner badge. This award, which is only available to 3% of the world's companies, highlights the efficient, flexible and tailored experience that this university provides to students. The recognition not only accredits the maximum rigor, performance and investment in TECH's digital infrastructures, but also places this university as one of the world's leading technology companies.

The top-rated university by its students

Students have positioned TECH as the world's top-rated university on the main review websites, with a highest rating of 4.9 out of 5, obtained from more than 1,000 reviews. These results consolidate TECH as the benchmark university institution at an international level, reflecting the excellence and positive impact of its educational model.

03

Syllabus

The didactic contents that make up this university program will provide experts with a comprehensive knowledge of the use of Artificial Intelligence in Aesthetic Medicine. The academic itinerary will delve into subjects ranging from the use of algorithms to obtain valuable clinical insights from large amounts of data or the development of predictive models with advanced software such as TensorFlow to security techniques to ensure the protection of confidential patient information. Thanks to this, graduates will be able to implement emerging technologies in their daily practice to improve operational efficiency and quality of services.

You will design individualized aesthetic treatment plans using data obtained through Artificial Intelligence, improving patient satisfaction"

Module 1. Fundamentals of Artificial Intelligence

1.1. History of Artificial Intelligence
- 1.1.1. When Do We Start Talking About Artificial Intelligence?
- 1.1.2. References in Film
- 1.1.3. Importance of Artificial Intelligence
- 1.1.4. Technologies that Enable and Support Artificial Intelligence

1.2. Artificial Intelligence in Games
- 1.2.1. Game Theory
- 1.2.2. Minimax and Alpha-Beta Pruning
- 1.2.3. Simulation: Monte Carlo

1.3. Neural Networks
- 1.3.1. Biological Fundamentals
- 1.3.2. Computational Model
- 1.3.3. Supervised and Unsupervised Neural Networks
- 1.3.4. Simple Perceptron
- 1.3.5. Multilayer Perceptron

1.4. Genetic Algorithms
- 1.4.1. History
- 1.4.2. Biological Basis
- 1.4.3. Problem Coding
- 1.4.4. Generation of the Initial Population
- 1.4.5. Main Algorithm and Genetic Operators
- 1.4.6. Evaluation of Individuals: Fitness

1.5. Thesauri, Vocabularies, Taxonomies
- 1.5.1. Vocabulary
- 1.5.2. Taxonomy
- 1.5.3. Thesauri
- 1.5.4. Ontologies
- 1.5.5. Knowledge Representation: Semantic Web

1.6. Semantic Web
- 1.6.1. Specifications: RDF, RDFS and OWL
- 1.6.2. Inference/ Reasoning
- 1.6.3. Linked Data

1.7. Expert Systems and DSS
  1.7.1. Expert Systems
  1.7.2. Decision Support Systems
1.8. Chatbots and Virtual Assistants
  1.8.1. Types of Assistants: Voice and Text Assistants
  1.8.2. Fundamental Parts for the Development of an Assistant: Intents, Entities and Dialogue Flow
  1.8.3. Integrations: Web, Slack, Whatsapp, Facebook
  1.8.4. Assistant Development Tools: *Dialog Flow, Watson Assistant*
1.9. AI Implementation Strategy
1.10. Future of Artificial Intelligence
  1.10.1. Understand How to Detect Emotions Using Algorithms
  1.10.2. Creating a Personality: Language, Expressions and Content
  1.10.3. Trends of Artificial Intelligence
  1.10.4. Reflections

Module 2. Data Types and Data Life Cycle

2.1. Statistics
  2.1.1. Statistics: Descriptive Statistics, Statistical Inferences
  2.1.2. Population, Sample, Individual
  2.1.3. Variables: Definition, Measurement Scales
2.2. Types of Data Statistics
  2.2.1. According to Type
    2.2.1.1. Quantitative: Continuous Data and Discrete Data
    2.2.1.2. Qualitative: Binomial Data, Nominal Data and Ordinal Data
  2.2.2. According to Its Shape
    2.2.2.1. Numeric
    2.2.2.2. Text
    2.2.2.3. Logical
  2.2.3. According to Its Source
    2.2.3.1. Primary
    2.2.3.2. Secondary
2.3. Life Cycle of Data
  2.3.1. Stages of the Cycle
  2.3.2. Milestones of the Cycle
  2.3.3. FAIR Principles
2.4. Initial Stages of the Cycle
  2.4.1. Definition of Goals
  2.4.2. Determination of Resource Requirements
  2.4.3. Gantt Chart
  2.4.4. Data Structure
2.5. Data Collection
  2.5.1. Methodology of Data Collection
  2.5.2. Data Collection Tools
  2.5.3. Data Collection Channels
2.6. Data Cleaning
  2.6.1. Phases of Data Cleansing
  2.6.2. Data Quality
  2.6.3. Data Manipulation (with R)
2.7. Data Analysis, Interpretation and Evaluation of Results
  2.7.1. Statistical Measures
  2.7.2. Relationship Indexes
  2.7.3. Data Mining
2.8. Datawarehouse
  2.8.1. Elements that Comprise It
  2.8.2. Design
  2.8.3. Aspects to Consider
2.9. Data Availability
  2.9.1. Access
  2.9.2. Uses
  2.9.3. Security
2.10. Regulatory Framework
  2.10.1. Data Protection Law
  2.10.2. Good Practices
  2.10.3. Other Regulatory Aspects

Module 3. Data in Artificial Intelligence

3.1. Data Science
- 3.1.1. Data Science
- 3.1.2. Advanced Tools for Data Scientists

3.2. Data, Information and Knowledge
- 3.2.1. Data, Information and Knowledge
- 3.2.2. Types of Data
- 3.2.3. Data Sources

3.3. From Data to Information
- 3.3.1. Data Analysis
- 3.3.2. Types of Analysis
- 3.3.3. Extraction of Information from a Dataset

3.4. Extraction of Information Through Visualization
- 3.4.1. Visualization as an Analysis Tool
- 3.4.2. Visualization Methods
- 3.4.3. Visualization of a Data Set

3.5. Data Quality
- 3.5.1. Quality Data
- 3.5.2. Data Cleaning
- 3.5.3. Basic Data Pre-Processing

3.6. *Dataset*
- 3.6.1. Dataset Enrichment
- 3.6.2. The Curse of Dimensionality
- 3.6.3. Modification of Our Data Set

3.7. Unbalance
- 3.7.1. Classes of Unbalance
- 3.7.2. Unbalance Mitigation Techniques
- 3.7.3. Balancing a Dataset

3.8. Unsupervised Models
- 3.8.1. Unsupervised Model
- 3.8.2. Methods
- 3.8.3. Classification with Unsupervised Models

3.9. Supervised Models
- 3.9.1. Supervised Model
- 3.9.2. Methods
- 3.9.3. Classification with Supervised Models

3.10. Tools and Good Practices
- 3.10.1. Good Practices for Data Scientists
- 3.10.2. The Best Model
- 3.10.3. Useful Tools

Module 4. Data Mining: Selection, Pre-Processing and Transformation

4.1. Statistical Inference
- 4.1.1. Descriptive Statistics vs. Statistical Inference
- 4.1.2. Parametric Procedures
- 4.1.3. Non-Parametric Procedures

4.2. Exploratory Analysis
- 4.2.1. Descriptive Analysis
- 4.2.2. Visualization
- 4.2.3. Data Preparation

4.3. Data Preparation
- 4.3.1. Integration and Data Cleaning
- 4.3.2. Normalization of Data
- 4.3.3. Transforming Attributes

4.4. Missing Values
- 4.4.1. Treatment of Missing Values
- 4.4.2. Maximum Likelihood Imputation Methods
- 4.4.3. Missing Value Imputation Using Machine Learning

4.5. Noise in the Data
- 4.5.1. Noise Classes and Attributes
- 4.5.2. Noise Filtering
- 4.5.3. The Effect of Noise

4.6. The Curse of Dimensionality
- 4.6.1. *Oversampling*
- 4.6.2. *Undersampling*
- 4.6.3. Multidimensional Data Reduction

4.7. From Continuous to Discrete Attributes
  4.7.1. Continuous Data vs. Discreet Data
  4.7.2. Discretization Process
4.8. The Data
  4.8.1. Data Selection
  4.8.2. Prospects and Selection Criteria
  4.8.3. Selection Methods
4.9. Instance Selection
  4.9.1. Methods for Instance Selection
  4.9.2. Prototype Selection
  4.9.3. Advanced Methods for Instance Selection
4.10. Data Pre-Processing in Big Data Environments

Module 5. Algorithm and Complexity in Artificial Intelligence

5.1. Introduction to Algorithm Design Strategies
  5.1.1. Recursion
  5.1.2. Divide and Conquer
  5.1.3. Other Strategies
5.2. Efficiency and Analysis of Algorithms
  5.2.1. Efficiency Measures
  5.2.2. Measuring the Size of the Input
  5.2.3. Measuring Execution Time
  5.2.4. Worst, Best and Average Case
  5.2.5. Asymptotic Notation
  5.2.6. Mathematical Analysis Criteria for Non-Recursive Algorithms
  5.2.7. Mathematical Analysis of Recursive Algorithms
  5.2.8. Empirical Analysis of Algorithms
5.3. Sorting Algorithms
  5.3.1. Concept of Sorting
  5.3.2. Bubble Sorting
  5.3.3. Sorting by Selection
  5.3.4. Sorting by Insertion
  5.3.5. Sorting by Merge (Merge_Sort)
  5.3.6. Quick Sorting (Quick_Sort)
5.4. Algorithms with Trees
  5.4.1. Tree Concept
  5.4.2. Binary Trees
  5.4.3. Tree Paths
  5.4.4. Representing Expressions
  5.4.5. Ordered Binary Trees
  5.4.6. Balanced Binary Trees
5.5. Algorithms Using Heaps
  5.5.1. Heaps
  5.5.2. The Heapsort Algorithm
  5.5.3. Priority Queues
5.6. Graph Algorithms
  5.6.1. Representation
  5.6.2. Traversal in Width
  5.6.3. Depth Travel
  5.6.4. Topological Sorting
5.7. Greedy Algorithms
  5.7.1. Greedy Strategy
  5.7.2. Elements of the Greedy Strategy
  5.7.3. Currency Exchange
  5.7.4. Traveler's Problem
  5.7.5. Backpack Problem
5.8. Minimal Path Finding
  5.8.1. The Minimum Path Problem
  5.8.2. Negative Arcs and Cycles
  5.8.3. Dijkstra's Algorithm
5.9. Greedy Algorithms on Graphs
  5.9.1. The Minimum Covering Tree
  5.9.2. Prim's Algorithm
  5.9.3. Kruskal's Algorithm
  5.9.4. Complexity Analysis
5.10. *Backtracking*
  5.10.1. Backtracking
  5.10.2. Alternative Techniques

Module 6. Intelligent Systems

6.1. Agent Theory
- 6.1.1. Concept History
- 6.1.2. Agent Definition
- 6.1.3. Agents in Artificial Intelligence
- 6.1.4. Agents in Software Engineering

6.2. Agent Architectures
- 6.2.1. The Reasoning Process of an Agent
- 6.2.2. Reactive Agents
- 6.2.3. Deductive Agents
- 6.2.4. Hybrid Agents
- 6.2.5. Comparison

6.3. Information and Knowledge
- 6.3.1. Difference between Data, Information and Knowledge
- 6.3.2. Data Quality Assessment
- 6.3.3. Data Collection Methods
- 6.3.4. Information Acquisition Methods
- 6.3.5. Knowledge Acquisition Methods

6.4. Knowledge Representation
- 6.4.1. The Importance of Knowledge Representation
- 6.4.2. Definition of Knowledge Representation According to Roles
- 6.4.3. Knowledge Representation Features

6.5. Ontologies
- 6.5.1. Introduction to Metadata
- 6.5.2. Philosophical Concept of Ontology
- 6.5.3. Computing Concept of Ontology
- 6.5.4. Domain Ontologies and Higher-Level Ontologies
- 6.5.5. How to Build an Ontology

6.6. Ontology Languages and Ontology Creation Software
- 6.6.1. Triple RDF, Turtle and N
- 6.6.2. RDF Schema
- 6.6.3. OWL
- 6.6.4. SPARQL
- 6.6.5. Introduction to Ontology Creation Tools
- 6.6.6. Installing and Using Protégé

6.7. Semantic Web
- 6.7.1. Current and Future Status of the Semantic Web
- 6.7.2. Semantic Web Applications

6.8. Other Knowledge Representation Models
- 6.8.1. Vocabulary
- 6.8.2. Global Vision
- 6.8.3. Taxonomy
- 6.8.4. Thesauri
- 6.8.5. Folksonomy
- 6.8.6. Comparison
- 6.8.7. Mind Maps

6.9. Knowledge Representation Assessment and Integration
- 6.9.1. Zero-Order Logic
- 6.9.2. First-Order Logic
- 6.9.3. Descriptive Logic
- 6.9.4. Relationship between Different Types of Logic
- 6.9.5. Prolog: Programming Based on First-Order Logic

6.10. Semantic Reasoners, Knowledge-Based Systems and Expert Systems
- 6.10.1. Concept of Reasoner
- 6.10.2. Reasoner Applications
- 6.10.3. Knowledge-Based Systems
- 6.10.4. MYCIN: History of Expert Systems
- 6.10.5. Expert Systems Elements and Architecture
- 6.10.6. Creating Expert Systems

Module 7. Machine Learning and Data Mining

7.1. Introduction to Knowledge Discovery Processes and Basic Concepts of Machine Learning
- 7.1.1. Key Concepts of Knowledge Discovery Processes
- 7.1.2. Historical Perspective of Knowledge Discovery Processes
- 7.1.3. Stages of the Knowledge Discovery Processes
- 7.1.4. Techniques Used in Knowledge Discovery Processes
- 7.1.5. Characteristics of Good Machine Learning Models
- 7.1.6. Types of Machine Learning Information
- 7.1.7. Basic Learning Concepts
- 7.1.8. Basic Concepts of Unsupervised Learning

7.2. Data Exploration and Pre-Processing
- 7.2.1. Data Processing
- 7.2.2. Data Processing in the Data Analysis Flow
- 7.2.3. Types of Data
- 7.2.4. Data Transformations
- 7.2.5. Visualization and Exploration of Continuous Variables
- 7.2.6. Visualization and Exploration of Categorical Variables
- 7.2.7. Correlation Measures
- 7.2.8. Most Common Graphic Representations
- 7.2.9. Introduction to Multivariate Analysis and Dimensionality Reduction

7.3. Decision Trees
- 7.3.1. ID Algorithm
- 7.3.2. Algorithm C
- 7.3.3. Overtraining and Pruning
- 7.3.4. Result Analysis

7.4. Evaluation of Classifiers
- 7.4.1. Confusion Matrices
- 7.4.2. Numerical Evaluation Matrices
- 7.4.3. Kappa Statistic
- 7.4.4. ROC Curves

7.5. Classification Rules
- 7.5.1. Rule Evaluation Measures
- 7.5.2. Introduction to Graphic Representation
- 7.5.3. Sequential Overlay Algorithm

7.6. Neural Networks
- 7.6.1. Basic Concepts
- 7.6.2. Simple Neural Networks
- 7.6.3. Backpropagation Algorithm
- 7.6.4. Introduction to Recurrent Neural Networks

7.7. Bayesian Methods
- 7.7.1. Basic Probability Concepts
- 7.7.2. Bayes' Theorem
- 7.7.3. Naive Bayes
- 7.7.4. Introduction to Bayesian Networks

7.8. Regression and Continuous Response Models
- 7.8.1. Simple Linear Regression
- 7.8.2. Multiple Linear Regression
- 7.8.3. Logistic Regression
- 7.8.4. Regression Trees
- 7.8.5. Introduction to Support Vector Machines (SVM)
- 7.8.6. Goodness-of-Fit Measures

7.9. *Clustering*
- 7.9.1. Basic Concepts
- 7.9.2. Hierarchical Clustering
- 7.9.3. Probabilistic Methods
- 7.9.4. EM Algorithm
- 7.9.5. B-Cubed Method
- 7.9.6. Implicit Methods

7.10. Text Mining and Natural Language Processing (NLP)
- 7.10.1. Basic Concepts
- 7.10.2. Corpus Creation
- 7.10.3. Descriptive Analysis
- 7.10.4. Introduction to Feelings Analysis

Module 8. Neural Networks, the Basis of Deep Learning

8.1. Deep Learning
- 8.1.1. Types of Deep Learning
- 8.1.2. Applications of Deep Learning
- 8.1.3. Advantages and Disadvantages of Deep Learning

8.2. Operations
- 8.2.1. Sum
- 8.2.2. Product
- 8.2.3. Transfer

8.3. Layers
- 8.3.1. Input Layer
- 8.3.2. Hidden Layer
- 8.3.3. Output Layer

8.4. Union of Layers and Operations
- 8.4.1. Architecture Design
- 8.4.2. Connection between Layers
- 8.4.3. Forward Propagation

8.5. Construction of the First Neural Network
- 8.5.1. Network Design
- 8.5.2. Establish the Weights
- 8.5.3. Network Training

8.6. Trainer and Optimizer
- 8.6.1. Optimizer Selection
- 8.6.2. Establishment of a Loss Function
- 8.6.3. Establishing a Metric

8.7. Application of the Principles of Neural Networks
- 8.7.1. Activation Functions
- 8.7.2. Backward Propagation
- 8.7.3. Parameter Adjustment

8.8. From Biological to Artificial Neurons
- 8.8.1. Functioning of a Biological Neuron
- 8.8.2. Transfer of Knowledge to Artificial Neurons
- 8.8.3. Establish Relations Between the Two

8.9. Implementation of MLP (Multilayer Perceptron) with Keras
- 8.9.1. Definition of the Network Structure
- 8.9.2. Model Compilation
- 8.9.3. Model Training

8.10. Fine Tuning Hyperparameters of Neural Networks
- 8.10.1. Selection of the Activation Function
- 8.10.2. Set the Learning Rate
- 8.10.3. Adjustment of Weights

Module 9. Deep Neural Networks Training

9.1. Gradient Problems
- 9.1.1. Gradient Optimization Techniques
- 9.1.2. Stochastic Gradients
- 9.1.3. Weight Initialization Techniques

9.2. Reuse of Pre-Trained Layers
- 9.2.1. Transfer Learning Training
- 9.2.2. Feature Extraction
- 9.2.3. Deep Learning

9.3. Optimizers
- 9.3.1. Stochastic Gradient Descent Optimizers
- 9.3.2. Optimizers Adam and RMSprop
- 9.3.3. Moment Optimizers

9.4. Learning Rate Programming
- 9.4.1. Automatic Learning Rate Control
- 9.4.2. Learning Cycles
- 9.4.3. Smoothing Terms

9.5. Overfitting
- 9.5.1. Cross Validation
- 9.5.2. Regularization
- 9.5.3. Evaluation Metrics

9.6. Practical Guidelines
- 9.6.1. Model Design
- 9.6.2. Selection of Metrics and Evaluation Parameters
- 9.6.3. Hypothesis Testing

9.7. *Transfer Learning*
- 9.7.1. Transfer Learning Training
- 9.7.2. Feature Extraction
- 9.7.3. Deep Learning

9.8. *Data Augmentation*
- 9.8.1. Image Transformations
- 9.8.2. Synthetic Data Generation
- 9.8.3. Text Transformation

9.9. Practical Application of Transfer Learning
- 9.9.1. Transfer Learning Training
- 9.9.2. Feature Extraction
- 9.9.3. Deep Learning

9.10. Regularization
- 9.10.1. L and L
- 9.10.2. Regularization by Maximum Entropy
- 9.10.3. *Dropout*

Module 10. Model Customization and Training with TensorFlow

10.1. *TensorFlow*
- 10.1.1. Use of the TensorFlow Library
- 10.1.2. Model Training with TensorFlow
- 10.1.3. Operations with Graphs in TensorFlow

10.2. TensorFlow and NumPy
- 10.2.1. NumPy Computing Environment for TensorFlow
- 10.2.2. Using NumPy Arrays with TensorFlow
- 10.2.3. NumPy Operations for TensorFlow Graphs

10.3. Model Customization and Training Algorithms
- 10.3.1. Building Custom Models with TensorFlow
- 10.3.2. Management of Training Parameters
- 10.3.3. Use of Optimization Techniques for Training

10.4. TensorFlow Features and Graphs
- 10.4.1. Functions with TensorFlow
- 10.4.2. Use of Graphs for Model Training
- 10.4.3. Graph Optimization with TensorFlow Operations

10.5. Loading and Preprocessing Data with TensorFlow
- 10.5.1. Loading Data Sets with TensorFlow
- 10.5.2. Pre-Processing Data with TensorFlow
- 10.5.3. Using TensorFlow Tools for Data Manipulation

10.6. The tfdata API
- 10.6.1. Using the tf.data API for Data Processing
- 10.6.2. Construction of Data Streams with tf.data
- 10.6.3. Using the tf.data API for Model Training

10.7. The TFRecord Format
- 10.7.1. Using the TFRecord API for Data Serialization
- 10.7.2. TFRecord File Upload with TensorFlow
- 10.7.3. Using TFRecord Files for Model Training

10.8. Keras Pre-Processing Layers
- 10.8.1. Using the Keras Pre-Processing API
- 10.8.2. Pre-Processing Pipelined Construction with Keras
- 10.8.3. Using the Keras Pre-Processing API for Model Training

10.9. The TensorFlow Datasets Project
- 10.9.1. Using TensorFlow Datasets for Data Loading
- 10.9.2. Data Pre-Processing with TensorFlow Datasets
- 10.9.3. Using TensorFlow Datasets for Model Training

10.10. Building a Deep Learning App with TensorFlow
- 10.10.1. Practical Application
- 10.10.2. Building a Deep Learning App with TensorFlow
- 10.10.3. Model Training with TensorFlow
- 10.10.4. Using the Application for the Prediction of Results

Module 11. Deep Computer Vision with Convolutional Neural Networks

11.1. The Visual Cortex Architecture
- 11.1.1. Functions of the Visual Cortex
- 11.1.2. Theories of Computational Vision
- 11.1.3. Models of Image Processing

11.2. Convolutional Layers
- 11.2.1. Reuse of Weights in Convolution
- 11.2.2. Convolution D
- 11.2.3. Activation Functions

11.3. Grouping Layers and Implementation of Grouping Layers with Keras
- 11.3.1. *Pooling and Striding*
- 11.3.2. *Flattening*
- 11.3.3. Types of Pooling

11.4. CNN Architecture
- 11.4.1. VGG Architecture
- 11.4.2. AlexNet Architecture
- 11.4.3. ResNet Architecture

11.5. Implementing a CNN ResNet- Using Keras
- 11.5.1. Weight Initialization
- 11.5.2. Input Layer Definition
- 11.5.3. Output Definition

11.6. Use of Pre-Trained Keras Models
- 11.6.1. Characteristics of Pre-Trained Models
- 11.6.2. Uses of Pre-Trained Models
- 11.6.3. Advantages of Pre-Trained Models

11.7. Pre-Trained Models for Transfer Learning
- 11.7.1. Transfer Learning
- 11.7.2. Transfer Learning Process
- 11.7.3. Advantages of Transfer Learning

11.8. Deep Computer Vision Classification and Localization
- 11.8.1. Image Classification
- 11.8.2. Localization of Objects in Images
- 11.8.3. Object Detection

11.9. Object Detection and Object Tracking
- 11.9.1. Object Detection Methods
- 11.9.2. Object Tracking Algorithms
- 11.9.3. Tracking and Localization Techniques

11.10. Semantic Segmentation
- 11.10.1. Deep Learning for Semantic Segmentation
- 11.10.2. Edge Detection
- 11.10.3. Rule-Based Segmentation Methods

Module 12. Natural Language Processing (NLP) with Recurrent Neural Networks (RNN) and Attention

12.1. Text Generation Using RNN
- 12.1.1. Training an RNN for Text Generation
- 12.1.2. Natural Language Generation with RNN
- 12.1.3. Text Generation Applications with RNN

12.2. Training Data Set Creation
- 12.2.1. Preparation of the Data for Training an RNN
- 12.2.2. Storage of the Training Dataset
- 12.2.3. Data Cleaning and Transformation
- 12.2.4. Sentiment Analysis

12.3. Classification of Opinions with RNN
- 12.3.1. Detection of Themes in Comments
- 12.3.2. Sentiment Analysis with Deep Learning Algorithms

12.4. Encoder-Decoder Network for Neural Machine Translation
- 12.4.1. Training an RNN for Machine Translation
- 12.4.2. Use of an Encoder-Decoder Network for Machine Translation
- 12.4.3. Improving the Accuracy of Machine Translation with RNNs

12.5. Attention Mechanisms
- 12.5.1. Application of Care Mechanisms in RNN
- 12.5.2. Use of Care Mechanisms to Improve the Accuracy of the Models
- 12.5.3. Advantages of Attention Mechanisms in Neural Networks

12.6. Transformer Models
- 12.6.1. Using Transformers Models for Natural Language Processing
- 12.6.2. Application of Transformers Models for Vision
- 12.6.3. Advantages of Transformers Models

12.7. Transformers for Vision
- 12.7.1. Use of Transformers Models for Vision
- 12.7.2. Image Data Pre-Processing
- 12.7.3. Training a Transformers Model for Vision

12.8. Hugging Face's Transformers Library
- 12.8.1. Using Hugging Face's Transformers Library
- 12.8.2. Hugging Face's Transformers Library Application
- 12.8.3. Advantages of Hugging Face's Transformers Library

12.9. Other Transformers Libraries. Comparison
- 12.9.1. Comparison Between Different Transformers Libraries
- 12.9.2. Use of the Other Transformers Libraries
- 12.9.3. Advantages of the Other Transformers Libraries

12.10. Development of an NLP Application with RNN and Attention. Practical Application
- 12.10.1. Development of a Natural Language Processing Application with RNN and Attention
- 12.10.2. Use of RNN, Attention Mechanisms and Transformers Models in the Application
- 12.10.3. Evaluation of the Practical Application

Module 13. Autoencoders, GANs, and Diffusion Models

13.1. Representation of Efficient Data
- 13.1.1. Dimensionality Reduction
- 13.1.2. Deep Learning
- 13.1.3. Compact Representations

13.2. PCA Realization with an Incomplete Linear Automatic Encoder
- 13.2.1. Training Process
- 13.2.2. Implementation in Python
- 13.2.3. Use of Test Data

13.3. Stacked Automatic Encoders
- 13.3.1. Deep Neural Networks
- 13.3.2. Construction of Coding Architectures
- 13.3.3. Use of Regularization

13.4. Convolutional Autoencoders
- 13.4.1. Design of Convolutional Models
- 13.4.2. Convolutional Model Training
- 13.4.3. Results Evaluation

13.5. Noise Suppression of Automatic Encoders
- 13.5.1. Filter Application
- 13.5.2. Design of Coding Models
- 13.5.3. Use of Regularization Techniques

13.6. Sparse Automatic Encoders
- 13.6.1. Increasing Coding Efficiency
- 13.6.2. Minimizing the Number of Parameters
- 13.6.3. Using Regularization Techniques

13.7. Variational Automatic Encoders
- 13.7.1. Use of Variational Optimization
- 13.7.2. Unsupervised Deep Learning
- 13.7.3. Deep Latent Representations

13.8. Generation of Fashion MNIST Images
- 13.8.1. Pattern Recognition
- 13.8.2. Image Generation
- 13.8.3. Deep Neural Networks Training

13.9. Generative Adversarial Networks and Diffusion Models
- 13.9.1. Content Generation from Images
- 13.9.2. Modeling of Data Distributions
- 13.9.3. Use of Adversarial Networks

13.10. Implementation of the Models
- 13.10.1. Practical Application
- 13.10.2. Implementation of the Models
- 13.10.3. Use of Real Data
- 13.10.4. Results Evaluation

Module 14. Bio-Inspired Computing

14.1. Introduction to Bio-Inspired Computing

14.2. Social Adaptation Algorithms
- 14.2.1. Bio-Inspired Computation Based on Ant Colonies
- 14.2.2. Variants of Ant Colony Algorithms
- 14.2.3. Particle Cloud Computing

14.3. Genetic Algorithms
- 14.3.1. General Structure
- 14.3.2. Implementations of the Major Operators

14.4. Space Exploration-Exploitation Strategies for Genetic Algorithms
- 14.4.1. CHC Algorithm
- 14.4.2. Multimodal Problems

14.5. Evolutionary Computing Models (I)
- 14.5.1. Evolutionary Strategies
- 14.5.2. Evolutionary Programming
- 14.5.3. Algorithms Based on Differential Evolution

14.6. Evolutionary Computation Models (II)
- 14.6.1. Evolutionary Models Based on Estimation of Distributions (EDA)
- 14.6.2. Genetic Programming

14.7. Evolutionary Programming Applied to Learning Problems
- 14.7.1. Rules-Based Learning
- 14.7.2. Evolutionary Methods in Instance Selection Problems

14.8. Multi-Objective Problems
- 14.8.1. Concept of Dominance
- 14.8.2. Application of Evolutionary Algorithms to Multi-Objective Problems

14.9. Neural Networks (I)
- 14.9.1. Introduction to Neural Networks
- 14.9.2. Practical Example with Neural Networks

14.10. Neural Networks (II)
- 14.10.1. Use Cases of Neural Networks in Medical Research
- 14.10.2. Use Cases of Neural Networks in Economics
- 14.10.3. Use Cases of Neural Networks in Artificial Vision

Module 15. Artificial Intelligence: Strategies and Applications

15.1. Financial Services
- 15.1.1. The Implications of Artificial Intelligence (AI) in Financial Services. Opportunities and Challenges
- 15.1.2. Case Studies
- 15.1.3. Potential Risks Related to the Use of AI
- 15.1.4. Potential Future Developments/Uses of AI

15.2. Implications of Artificial Intelligence in Healthcare Service
- 15.2.1. Implications of AI in the Healthcare Sector. Opportunities and Challenges
- 15.2.2. Case Studies

15.3. Risks Related to the Use of AI in Healthcare Service
- 15.3.1. Potential Risks Related to the Use of AI
- 15.3.2. Potential Future Developments/Uses of AI

15.4. *Retail*
- 15.4.1. Implications of AI in Retail. Opportunities and Challenges
- 15.4.2. Case Studies
- 15.4.3. Potential Risks Related to the Use of AI
- 15.4.4. Potential Future Developments/Uses of AI

15.5. Industry
- 15.5.1. Implications of AI in Industry. Opportunities and Challenges
- 15.5.2. Case Studies

15.6. Potential Risks Related to the Use of AI in Industry
- 15.6.1. Case Studies
- 15.6.2. Potential Risks Related to the Use of AI
- 15.6.3. Potential Future Developments/Uses of AI

15.7. Public Administration
- 15.7.1. AI Implications for Public Administration. Opportunities and Challenges
- 15.7.2. Case Studies
- 15.7.3. Potential Risks Related to the Use of AI
- 15.7.4. Potential Future Developments/Uses of AI

15.8. Educational
- 15.8.1. AI Implications for Education. Opportunities and Challenges
- 15.8.2. Case Studies
- 15.8.3. Potential Risks Related to the Use of AI
- 15.8.4. Potential Future Developments/Uses of AI

15.9. Forestry and Agriculture
- 15.9.1. Implications of AI in Forestry and Agriculture. Opportunities and Challenges
- 15.9.2. Case Studies
- 15.9.3. Potential Risks Related to the Use of AI
- 15.9.4. Potential Future Developments/Uses of AI

15.10. Human Resources
- 15.10.1. Implications of AI in Human Resources. Opportunities and Challenges
- 15.10.2. Case Studies
- 15.10.3. Potential Risks Related to the Use of AI
- 15.10.4. Potential Future Developments/Uses of AI

Module 16. Clinical Data Processing for Predictive Modeling in Aesthetic Medicine

16.1. Patient Data Collection and Storage
- 16.1.1. Database Implementation for Secure, Scalable Storage (MongoDB Atlas)
- 16.1.2. Facial and Body Image Data Collection (Google Cloud Vision AI)
- 16.1.3. Collection of Clinical History and Risk Factors (Epic Systems AI)
- 16.1.4. Integration of Data from Medical Devices and Wearables (Fitbit Health Solutions)

16.2. Data Cleaning and Normalization for Predictive Modeling
- 16.2.1. Detection and Correction of Missing or Inconsistent Data (OpenRefine)
- 16.2.2. Normalization of Image and Clinical Text Data Formats (Pandas AI Library)
- 16.2.3. Elimination of Bias in Clinical and Aesthetic Data (IBM AI Fairness 360)
- 16.2.4. Pre-Processing and Organization of Data to Train Predictive Models (TensorFlow)

16.3. Medical Image Data Structuring
- 16.3.1. Facial Image Segmentation for Feature Analysis (NVIDIA Clara)
- 16.3.2. Identification and Classification of Skin Areas of Interest (SkinIO)
- 16.3.3. Organization of Image Data in Different Resolutions and Layers (Clarifai)
- 16.3.4. Labeling of Medical Images to Train Neural Networks (Labelbox)

16.4. Predictive Modeling Based on Personal Data
- 16.4.1. Prediction of Aesthetic Results from Historical Data (H2O.ai AutoML)
- 16.4.2. Machine Learning Models for Personalized Treatment (Amazon SageMaker)
- 16.4.3. Deep Neural Networks for Predicting Response to Treatments (DeepMind AlphaFold)
- 16.4.4. Personalization of Models according to Facial and Body Features (Google AutoML Vision)

16.5. Analysis of External and Environmental Factors in Aesthetic Results
- 16.5.1. Incorporation of Meteorological Data in Skin Analysis (Weather Company Data on IBM Cloud)
- 16.5.2. Modeling UV Exposure and Its Impact on the Skin (NOAA AI UV Index)
- 16.5.3. Integration of Lifestyle Factors in Predictive Models (WellnessFX AI)
- 16.5.4. Analysis of Interactions between Environmental Factors and Treatments (Proven Skincare AI)

16.6. Generation of Synthetic Data for Training
- 16.6.1. Synthetic Data Creation to Improve Model Training (Synthea)
- 16.6.2. Synthetic Imaging of Rare Skin Conditions (NVIDIA GANs)
- 16.6.3. Simulation of Variations in Skin Textures and Skin Tones (DataGen)
- 16.6.4. Use of Synthetic Data to Avoid Privacy Concerns (Synthetic Data Vault)

16.7. Anonymization and Security of Patient Data
- 16.7.1. Implementation of Clinical Data Anonymization Techniques (OneTrust)
- 16.7.2. Encryption of Sensitive Data in Patient Databases (AWS Key Management Service)
- 16.7.3. Pseudonymization to Protect Personal Data in AI Models (Microsoft Azure AI Privacy)
- 16.7.4. Auditing and Monitoring Access to Patient Data (Datadog AI Security)

16.8. Optimization of Predictive Models for Personalization of Treatment
- 16.8.1. Selection of Predictive Algorithms Based on Structured Data (DataRobot)
- 16.8.2. Optimization of Hyperparameters in Predictive Models (Keras Tuner)
- 16.8.3. Cross-Validation and Testing of Customized Models (Scikit-learn)
- 16.8.4. Model Fitting based on Outcome Feedback (MLflow)

16.9. Data Visualization and Predictive Results
- 16.9.1. Creating Visualization Dashboards for Predictive Results (Tableau)
- 16.9.2. Treatment Progression Charts and Long-Term Predictions (Power BI)
- 16.9.3. Visualization of Multivariate Analysis on Patient Data (Plotly)
- 16.9.4. Comparison of Results between Different Predictive Models (Looker)

16.10. Updating and Maintaining Predictive Models with New Data
- 16.10.1. Continuous Integration of New Data into Trained Models (Google Vertex AI Pipelines)
- 16.10.2. Performance Monitoring and Automatic Adjustments in Models (IBM Watson Machine Learning)
- 16.10.3. Updating Predictive Models Based on Recent Data Patterns (Amazon SageMaker Model Monitor)
- 16.10.4. Real-Time Feedback for Continuous Model Improvement (Dataiku)

Module 17. Modeling and Simulation in Aesthetic Medicine

17.1. Procedure Simulation with Artificial Intelligence
- 17.1.1. 3D Simulation of Facial Changes in Rejuvenation Procedures (Crisalix)
- 17.1.2. Modeling Dermal Fillers Results and Lip Adjustments (Modiface)
- 17.1.3. Visualization of Body Aesthetic Surgery Results (MirrorMe3D)
- 17.1.4. Real-Time Projection of Botox and Fillers Results (TouchMD)

17.2. Creating 3D Patient Models
- 17.2.1. Generating 3D Facial Models from Photographs (FaceGen)
- 17.2.2. 3D Body Scanning and Reconstruction for Aesthetic Simulation (Artec Eva)
- 17.2.3. Integration of Anatomical Data into 3D Models (Materialise Mimics)
- 17.2.4. Realistic Skin Modeling and Texturing in Facial Reconstructions (ZBrush)

17.3. Simulation of Plastic Surgery Outcomes
- 17.3.1. Simulation of Rhinoplasties with Modeling of Bone Structures (Rhinomodel)
- 17.3.2. Projection of Results in Mammoplasty and Other Body Procedures (VECTRA 3D)
- 17.3.3. Prediction of Changes in Post-Surgery Facial Symmetry (Geomagic Freeform)
- 17.3.4. Visualization of Facelift and Facelift Results (Canfield Scientific)

17.4. Scar Reduction and Skin Regeneration Simulation
- 17.4.1. Simulation of Dermal Regeneration in Laser Treatments (Canfield VECTRA)
- 17.4.2. Prediction of Scar Evolution with AI Algorithms (DermaCompare)
- 17.4.3. Modeling the Effects of Chemical Peels in Skin Regeneration (SkinIO)
- 17.4.4. Projection of Results in Advanced Healing Treatments (Medgadget SkinAI)

17.5. Projection of Results in Rejuvenation Therapies
- 17.5.1. Modeling the Effects of Expression Line Reduction (DeepFaceLab)
- 17.5.2. Simulation of Radiofrequency Therapies and Their Impact on Firmness (Visage Technologies)
- 17.5.3. Prediction of Results in Laser Resurfacing Procedures (Syneron Candela eTwo)
- 17.5.4. Visualization of the Effect of Intense Pulsed Light (IPL) Treatments (3D LifeViz)

17.6. Facial Symmetry Analysis
- 17.6.1. Evaluation of Facial Proportions by Means of Reference Points (Face++)
- 17.6.2. Real-Time Symmetry Measurement for Aesthetic Procedures (Dlib)
- 17.6.3. Analysis of Facial Proportions in Harmonization Procedures (MorphoStudio)
- 17.6.4. Comparison of Symmetry before and after Aesthetic Treatments (MediCapture)

17.7. Volume Evaluation in Body Contouring
- 17.7.1. Volumetric Measurement in Liposuction and Contouring Simulation (3D Sculptor)
- 17.7.2. Analysis of Volume Changes in Buttock Augmentation Procedures (Sculpt My Body)
- 17.7.3. Post-Lifting Body Contouring Evaluation (Virtual Surgical Planning)
- 17.7.4. Prediction of Volume Changes in Non-Invasive Body Contouring (CoolSculpting Virtual Consult)

17.8. Simulation of Hair Treatments
- 17.8.1. Visualization of Results in Hair Transplantation (HairMetrix)
- 17.8.2. Projection of Hair Growth in PRP Treatments (TruScalp AI)
- 17.8.3. Simulation of Hair Loss and Density in Alopecia (Keeps AI)
- 17.8.4. Evaluation of the Effects of Mesotherapy Treatments on Hair (HairDX)

17.9. Simulation for Body Weight Reduction
- 17.9.1. Projection of Results of Reductive and Shaping Treatments (Weight Loss Predictor)
- 17.9.2. Analysis of Body Changes in Cryolipolysis Procedures (SculpSure Consult)
- 17.9.3. Simulation of Volume Reduction in Ultrasonic Cavitation (UltraShape AI)
- 17.9.4. Visualization of Body Radiofrequency Treatment Results (InMode BodyTite)

17.10. Modeling of Liposuction Procedures
- 17.10.1. 3D Simulation of Abdominal Liposuction Procedure Results (VASER Shape)
- 17.10.2. Evaluation of Changes in Hips and Thighs after Liposuction (Body FX)
- 17.10.3. Modeling of Fat Reduction in Small and Targeted Areas (LipoAI)
- 17.10.4. Visualization of Laser-Assisted Liposuction Results (SmartLipo Triplex)

Module 18. Diagnosis and Analysis with Artificial Intelligence in Aesthetic Medicine

18.1. Diagnosis of Cutaneous Anomalies
- 18.1.1. Detection of Melanomas and Suspicious Skin Lesions (SkinVision)
- 18.1.2. Identification of Pre-Cancerous Lesions with AI Algorithms (DermaSensor)
- 18.1.3. Real-Time Analysis of Mole and Mole Patterns (MoleScope)
- 18.1.4. Classification of Skin Lesion Types with Neural Networks (SkinIO)

18.2. Skin Tone and Texture Analysis
- 18.2.1. Advanced Evaluation of Skin Texture Using Computer Vision (HiMirror)
- 18.2.2. Uniformity and Skin Tone Analysis Using AI Models (Visia Complexion Analysis)
- 18.2.3. Comparison of Texture Changes after Aesthetic Treatments (Canfield Reveal Imager)
- 18.2.4. Measurement of Firmness and Smoothness in Skin Using AI Algorithms (MySkin AI)

18.3. Detection of Sun Damage and Pigmentation
- 18.3.1. Identification of Hidden Sun Damage in Deep Skin Layers (VISIA Skin Analysis)
- 18.3.2. Segmentation and Classification of Hyperpigmentation Areas (Adobe Sensei)
- 18.3.3. Detection of Sunspots in Different Skin Types (SkinScope LED)
- 18.3.4. Evaluating the Efficacy of Treatments for Hyperpigmentation (Melanin Analyzer AI)

18.4. Diagnosis of Acne and Blemishes
- 18.4.1. Identification of Acne Types and Severity of Lesions (Aysa AI)
- 18.4.2. Classification of Acne Scars for Treatment Selection (Skinome)
- 18.4.3. Real-Time Analysis of Facial Blemish Patterns (Face++)
- 18.4.4. Evaluation of Skin Improvements after Acne Treatment (Effaclar AI)

18.5. Prediction of Skin Treatment Effectiveness
- 18.5.1. Modeling Skin Response to Rejuvenation Treatments (Rynkl)
- 18.5.2. Prediction of Results in Hyaluronic Acid Therapies (Modiface)
- 18.5.3. Evaluation of the Efficacy of Customized Dermatological Products (SkinCeuticals Custom D.O.S.E.)
- 18.5.4. Follow-Up of Skin Response in Laser Therapies (Spectra AI)

18.6. Facial Aging Analysis
- 18.6.1. Projection of Apparent Age and Signs of Facial Aging (PhotoAge)
- 18.6.2. Modeling of Skin Elasticity Loss Over Time (FaceLab)
- 18.6.3. Detecting Expression Lines and Deep Wrinkles in the Face (Visia Wrinkle Analysis)
- 18.6.4. Evaluation of the Progression of Signs of Aging (AgingBooth AI)

18.7. Detection of Vascular Skin Damage
- 18.7.1. Identification of Varicose Veins and Capillary Damage in the Skin (VeinViewer Vision2)
- 18.7.2. Evaluation of Telangiectasias and Spider Veins on the Face (Canfield Vascular Imager)
- 18.7.3. Analysis of the Effectiveness of Vascular Sclerosis Treatments (VascuLogic AI)
- 18.7.4. Follow-Up of Changes in Vascular Damage Post-Treatment (Clarity AI)

18.8. Diagnosis of Facial Volume Loss
- 18.8.1. Analysis of Volume Loss in Cheekbones and Facial Contours (RealSelf AI Volume Analysis)
- 18.8.2. Facial Fat Redistribution Modeling for Filler Planning (MirrorMe3D)
- 18.8.3. Tissue Density Assessment in Specific Areas of the Face (3DMDface System)
- 18.8.4. Simulation of Filler Results in Facial Volume Replenishment (Crisalix Volume)

18.9. Skin Elasticity and Sagging Detection
- 18.9.1. Measurement of Skin Elasticity and Firmness (Cutometer)
- 18.9.2. Analysis of Sagging in Neck and Jaw Lines (Visage Technologies Elasticity Analyzer)
- 18.9.3. Evaluation of Changes in Elasticity after Radiofrequency Procedures (Thermage AI)
- 18.9.4. Prediction of Improvement in Firmness with Ultrasound Treatments (Ultherapy AI)

18.10. Evaluation of Laser Treatment Results
- 18.10.1. Analysis of Skin Regeneration in Fractional Laser Therapies (Fraxel AI)
- 18.10.2. Monitoring of Laser Blemish and Pigmentation Removal (PicoSure AI)
- 18.10.3. Evaluation of Scar Reduction with Laser Therapy (CO2RE AI)
- 18.10.4. Comparison of Rejuvenation Results after Laser Therapy (Clear + Brilliant AI)

Module 19. Personalization and Optimization of Aesthetic Treatments with Artificial Intelligence

19.1. Skin Care Regimen Customization
- 19.1.1. Skin Type Analysis and Customized Recommendations (SkinCeuticals Custom D.O.S.E)
- 19.1.2. Skin Sensitivity Assessment and Cosmetic Product Adjustment (Atolla)
- 19.1.3. Diagnosis of Aging Factors for Personalized Anti-Aging Routines (Proven Skincare)
- 19.1.4. Recommendations Based on Climate and Environmental Conditions (HelloAva)

19.2. Optimization of Filler and Botox Treatments
- 19.2.1. Simulation of Filler Results for Specific Facial Areas (Modiface)
- 19.2.2. Adjustment of Botox Doses in Expression Areas according to Facial Analysis (Botox Visualizer)
- 19.2.3. Evaluation of Duration and Effectiveness of Filler Treatments (Crisalix Botox & Filler Simulators)
- 19.2.4. Prediction of Results in Filler Treatments with Advanced AI (Aesthetic Immersion AI)

19.3. Personalization of Anti-Aging Routines
- 19.3.1. Selection of Specific Anti-Aging Active Ingredients and Products (Function of Beauty Anti-Aging)
- 19.3.2. Diagnosis of Wrinkles and Fine Lines to Personalize Creams and Serums (Aysa AI)
- 19.3.3. Optimization of the Concentration of Active Ingredients in Anti-Aging Products (L'Oréal Perso)
- 19.3.4. Routine Adjustment according to the Level of Sun Exposure and Lifestyle (SkinCoach)

19.4. Development of Individualized Protocols for Peelings
- 19.4.1. Evaluation of Skin Sensitivity and Skin Thickness for Peels (MySkin AI)
- 19.4.2. Blemish and Pigmentation Analysis for Selection of Specific Peels (Canfield Reveal Imager)
- 19.4.3. Customization of Chemical Peels according to Skin Type (Skin IO Custom Peels)
- 19.4.4. Simulation of Peel Results and Regeneration Follow-Up (MoleScope AI)

19.5. Optimization of Hyperpigmentation Treatments
- 19.5.1. Analysis of Hyperpigmentation Causes and Selection of Appropriate Treatment (Melanin Analyzer AI)
- 19.5.2. Customization of Intense Pulsed Light (IPL) Blemish Treatments (Syneron Candela IPL)
- 19.5.3. Follow-Up of the Evolution of Hyperpigmentation after Treatment (VISIA Skin Analysis)
- 19.5.4. Predicting Results of Depigmentation with Advanced AI (SkinCeuticals Pigment Regulator)

19.6. Adaptation of Body Rejuvenation Treatments
- 19.6.1. Body Flaccidity and Firmness Analysis for Body Firming Treatments (InMode BodyTite)
- 19.6.2. Evaluation of Skin Tone and Texture for Skin Rejuvenation Procedures (Cutera Xeo)
- 19.6.3. Customization of Body Radiofrequency to Individual Needs (Thermage FLX)
- 19.6.4. Simulation of Results in Non-Invasive Body Rejuvenation Treatments (CoolSculpting Visualizer)

19.7. Personalization of Rosacea Treatments
- 19.7.1. Diagnosis of the Degree of Rosacea and Personalization of Treatment (Aysa AI for Rosacea)
- 19.7.2. Recommendation of Specific Products and Routines for Rosacea (La Roche-Posay Effaclar AI)
- 19.7.3. Adjustment of Pulsed Light Treatments to Reduce Redness (Lumenis IPL)
- 19.7.4. Follow-Up of Improvements and Adjustment of Protocols in Rosacea Treatment (Cutera Excel V)

19.8. Adjustment in Facial Laser Rejuvenation Protocols
- 19.8.1. Personalization of Fractional Laser Parameters according to Skin Type (Fraxel Dual AI)
- 19.8.2. Energy and Duration Optimization in Laser Resurfacing Treatments (PicoSure AI)
- 19.8.3. Simulation of Results and Post-Treatment Follow-Up (Clear + Brilliant)
- 19.8.4. Evaluation of Improvement in Texture and Tone after Laser Treatments (VISIA Complexion Analysis)

19.9. Adaptation of Body Contouring Procedures
- 19.9.1. Customization of Cryolipolysis Treatments in Specific Areas (CoolSculpting AI)
- 19.9.2. Optimization of Parameters in Focused Ultrasound Treatments (Ultherapy)
- 19.9.3. Fine-Tuning Body Contouring Radiofrequency Procedures (Body FX AI)
- 19.9.4. Simulation of Results in Non-Invasive Body Contouring (SculpSure Consult)

19.10. Personalization of Hair Regeneration Treatments
- 19.10.1. Evaluation of the Degree of Alopecia and Personalization of Hair Treatment (HairMetrix)
- 19.10.2. Optimization of Density and Growth in Hair Transplants (ARTAS iX Robotic Hair Restoration)
- 19.10.3. Simulation of Hair Growth in Treatments with PRP (TruScalp AI)
- 19.10.4. Monitoring the Response to Hair Mesotherapy Therapies (Keeps AI)

Module 20. Artificial Intelligence for Monitoring and Maintenance in Aesthetic Medicine

20.1. Post-Treatment Results Monitoring
- 20.1.1. Follow-Up of Evolution in Facial Treatments with Imaging (Canfield VECTRA)
- 20.1.2. Comparison of Before and After Results in Body Procedures (MirrorMe3D)
- 20.1.3. Automatic Evaluation of Texture and Tone Improvement after Treatment (VISIA Skin Analysis)
- 20.1.4. Documentation and Analysis of Skin Healing Progress (SkinIO)

20.2. Aesthetic Routine Adherence Analysis
- 20.2.1. Detection of Adherence to Daily Skin Care Routines (SkinCoach)
- 20.2.2. Evaluation of Adherence to Aesthetic Product Recommendations (HelloAva)
- 20.2.3. Analysis of Treatment Habits and Routines according to Lifestyle (Proven Skincare)
- 20.2.4. Adjustment of Routines Based on Daily Adherence Follow-up (Noom Skin AI)

20.3. Detection of Early Adverse Effects
- 20.3.1. Identification of Adverse Reactions in Dermal Filler Treatments (SkinVision)
- 20.3.2. Monitoring Inflammation and Post-Treatment Redness (Effaclar AI)
- 20.3.3. Monitoring Side Effects after Laser Resurfacing Procedures (Fraxel AI)
- 20.3.4. Early Warning of Post-Inflammatory Hyperpigmentation (DermaSensor)

20.4. Long-Term Follow-Up of Facial Treatments
- 20.4.1. Analysis of the Durability of the Effects of Fillers and Botox (Modiface)
- 20.4.2. Long-Term Outcome Monitoring of Facelift Procedures (Aesthetic One)
- 20.4.3. Evaluating Gradual Changes in Facial Elasticity and Firmness (Cutometer)
- 20.4.4. Follow-Up of Facial Volume Improvements after Fat Grafting (Crisalix Volume)

0.5. Control of Implant and Filler Results
- 20.5.1. Detection of Displacements or Irregularities in Facial Implants (VECTRA 3D)
- 20.5.2. Volume and Shape Tracking in Body Implants (3D LifeViz)
- 20.5.3. Analysis of the Durability of Fillers and Their Effect on Facial Contouring (RealSelf AI Volume Analysis)
- 20.5.4. Evaluation of Symmetry and Proportion in Facial Implants (MirrorMe3D)

20.6. Evaluation of Results in Blemish Treatments
- 20.6.1. Monitoring Sunspot Reduction after IPL Treatment (Lumenis AI IPL)
- 20.6.2. Evaluation of Changes in Hyperpigmentation and Skin Tone (VISIA Skin Analysis)
- 20.6.3. Monitoring the Evolution of Melasma Spots in Specific Areas (Canfield Reveal Imager)
- 20.6.4. Comparison of Images to Measure Effectiveness of Depigmentation Treatments (Adobe Sensei)

20.7. Skin Elasticity and Firmness Monitoring
- 20.7.1. Measuring Changes in Elasticity after Radiofrequency Treatments (Thermage AI)
- 20.7.2. Evaluation of Improvement in Firmness after Ultrasound Treatments (Ultherapy)
- 20.7.3. Monitoring Skin Firmness in the Face and Neck (Cutera Xeo)
- 20.7.4. Elasticity Monitoring after Use of Creams and Topical Products (Cutometer)

20.8. Efficiency Control in Anti-Cellulite Treatments
- 20.8.1. Cellulite Reduction Analysis in Cavitation Procedures (UltraShape AI)
- 20.8.2. Evaluation of Texture and Volume Changes after Anti-Cellulite Treatment (VASER Shape)
- 20.8.3. Monitoring Improvements after Body Mesotherapy Procedures (Body FX)
- 20.8.4. Comparison of Cellulite Reduction Results with Cryolipolysis (CoolSculpting AI)

20.9. Peel Results Stability Analysis
- 20.9.1. Monitoring Skin Regeneration and Texture after Chemical Peeling (VISIA Complexion Analysis)
- 20.9.2. Evaluation of Sensitivity and Redness after Peels (SkinScope LED)
- 20.9.3. Monitoring Post-Peel Blemish Reduction (MySkin AI)
- 20.9.4. Comparison of Long-Term Results after Multiple Peel Sessions (VISIA Skin Analysis)

20.10. Adapting Protocols for Optimal Results
- 20.10.1. Adjustment of Parameters in Rejuvenation Treatments According to Results (Aesthetic One)
- 20.10.2. Customization of Post-Treatment Maintenance Protocols (SkinCeuticals Custom D.O.S.E)
- 20.10.3. Optimization of Time between Sessions of Non-Invasive Procedures (Aysa AI)
- 20.10.4. Home Care Recommendations Based on Treatment Response (HelloAva)

You will be able to access the Virtual Campus at any time and download the contents to consult them whenever you wish"

04

Teaching Objectives

Through this comprehensive university program, professionals will master the main technological tools of Artificial Intelligence applied in the field of Aesthetic Medicine. In this way, graduates will acquire advanced clinical skills to handle specialized software in areas such as data management, the use of virtual assistants and even simulation tools to predict the results of treatments. In this way, specialists will be highly qualified to personalize care and increase the precision of their therapies significantly.

You will have a holistic understanding of the regulations related to the protection of personal data in the field of healthcare, ensuring ethical practices in the handling of sensitive information"

General Objectives

- Develop advanced skills in the collection, cleaning and structuring of clinical and aesthetic data, ensuring the quality of the information
- Create and train predictive models based on Artificial Intelligence, able to anticipate aesthetic treatment results with high precision and personalization
- Manage specialized 3D simulation software to project potential outcomes of therapies
- Implement AI algorithms to improve accuracy in factors such as skin anomaly detection, sun damage assessment or skin texture
- Design clinical protocols tailored to the individual characteristics of each patient; taking into account their clinical data, environmental factors, and lifestyle
- Apply techniques for anonymization, encryption and ethical management of sensitive data
- Develop strategies to assess and adjust treatments based on the evolution of individuals, using visualization and predictive analytics tools
- Use synthetic data to train Artificial Intelligence models, extending predictive capabilities and respecting patients' privacy
- Adopt emerging Artificial Intelligence techniques to adjust and continuously improve therapeutic plans
- Be able to lead innovation projects, applying advanced technological knowledge to transform the Aesthetic Medicine sector

Specific Objectives

Module 1. Fundamentals of Artificial Intelligence

- Analyze the historical evolution of Artificial Intelligence, from its beginnings to its current state, identifying key milestones and developments.
- Understand the functioning of neural networks and their application in learning models in Artificial Intelligence.
- Study the principles and applications of genetic algorithms, analyzing their usefulness in solving complex problems
- Analyze the importance of thesauri, vocabularies and taxonomies in the structuring and processing of data for AI systems

Module 2. Data Types and Data Life Cycle

- Understand the fundamental concepts of statistics and their application in data analysis
- Identify and classify the different types of statistical data, from quantitative to qualitative data
- Analyze the life cycle of data, from generation to disposal, identifying key stages
- Explore the initial stages of the data life cycle, highlighting the importance of data planning and structure
- Study data collection processes, including methodology, tools and collection channels
- Explore the Datawarehouse concept, with emphasis on the elements that comprise it and its design

Module 3. Data in Artificial Intelligence

- Master the fundamentals of data science, covering tools, types and sources for information analysis
- Explore the process of transforming data into information using data mining and visualization techniques
- Study the structure and characteristics of datasets, understanding their importance in the preparation and use of data for Artificial Intelligence models
- Use specific tools and best practices in data handling and processing, ensuring efficiency and quality in the implementation of Artificial Intelligence

Module 4. Data Mining: Selection, Pre-Processing and Transformation

- Master the techniques of statistical inference to understand and apply statistical methods in data mining
- Perform detailed exploratory analysis of data sets to identify relevant patterns, anomalies, and trends
- Develop skills for data preparation, including data cleaning, integration, and formatting for use in data mining
- Implement effective strategies for handling missing values in datasets, applying imputation or elimination methods according to context
- Identify and mitigate noise present in data, using filtering and smoothing techniques to improve the quality of the data set
- Address data preprocessing in Big Data environments

Module 5. Algorithm and Complexity in Artificial Intelligence

- Introduce algorithm design strategies, providing a solid understanding of fundamental approaches to problem solving
- Analyze the efficiency and complexity of algorithms, applying analysis techniques to evaluate performance in terms of time and space
- Study and apply sorting algorithms, understanding their performance and comparing their efficiency in different contexts
- Explore tree-based algorithms, understanding their structure and applications
- Investigate algorithms with Heaps, analyzing their implementation and usefulness in efficient data manipulation
- Analyze graph-based algorithms, exploring their application in the representation and solution of problems involving complex relationships
- Study Greedy algorithms, understanding their logic and applications in solving optimization problems.
- Investigate and apply the backtracking technique for systematic problem solving, analyzing its effectiveness in various scenarios

Module 6. Intelligent Systems

- Explore agent theory, understanding the fundamental concepts of its operation and its application in Artificial Intelligence and software engineering
- Study the representation of knowledge, including the analysis of ontologies and their application in the organization of structured information
- Analyze the concept of the semantic web and its impact on the organization and retrieval of information in digital environments.
- Evaluate and compare different knowledge representations, integrating these to improve the efficiency and accuracy of intelligent systems

Module 7. Machine Learning and Data Mining

- Introduce the processes of knowledge discovery and the fundamental concepts of machine learning
- Study decision trees as supervised learning models, understanding their structure and applications
- Evaluate classifiers using specific techniques to measure their performance and accuracy in data classification
- Study neural networks, understanding their operation and architecture to solve complex machine learning problems
- Explore Bayesian methods and their application in machine learning, including Bayesian networks and Bayesian classifiers
- Analyze regression and continuous response models for predicting numerical values from data
- Study clustering techniques to identify patterns and structures in unlabeled data sets
- Explore text mining and natural language processing (NLP), understanding how machine learning techniques are applied to analyze and understand text

Module 8. Neural Networks, the Basis of Deep Learning

- Master the fundamentals of Deep Learning, understanding its essential role in Deep Learning
- Explore the fundamental operations in neural networks and understand their application in model building
- Analyze the different layers used in neural networks and learn how to select them appropriately

- Understand the effective linking of layers and operations to design complex and efficient neural network architectures
- Use trainers and optimizers to tune and improve the performance of neural networks
- Explore the connection between biological and artificial neurons for a deeper understanding of model design

Module 9. Deep Neural Networks Training

- Solve gradient-related problems in deep neural network training
- Explore and apply different optimizers to improve the efficiency and convergence of models
- Program the learning rate to dynamically adjust the convergence speed of the model
- Understand and address overfitting through specific strategies during training
- Apply practical guidelines to ensure efficient and effective training of deep neural networks
- Implement Transfer Learning as an advanced technique to improve model performance on specific tasks
- Explore and apply Data Augmentation techniques to enrich datasets and improve model generalization
- Develop practical applications using Transfer Learning to solve real-world problems

Module 10. Model Customization and Training with TensorFlow

- Master the fundamentals of TensorFlow and its integration with NumPy for efficient data management and calculations
- Customize models and training algorithms using the advanced capabilities of TensorFlow
- Explore the tfdata API to efficiently manage and manipulate datasets
- Implement the TFRecord format for storing and accessing large datasets in TensorFlow
- Use Keras preprocessing layers to facilitate the construction of custom models
- Explore the TensorFlow Datasets project to access predefined datasets and improve development efficiency
- Develop a Deep Learning application with TensorFlow, integrating the knowledge acquired in the module
- Apply in a practical way all the concepts learned in building and training custom models with TensorFlow in real-world situations

Module 11. Deep Computer Vision with Convolutional Neural Networks

- Understand the architecture of the visual cortex and its relevance in Deep Computer Vision
- Explore and apply convolutional layers to extract key features from images
- Implement clustering layers and their use in Deep Computer Vision models with Keras
- Analyze various Convolutional Neural Network (CNN) architectures and their applicability in different contexts
- Develop and implement a CNN ResNet using the Keras library to improve model efficiency and performance
- Use pre-trained Keras models to leverage transfer learning for specific tasks
- Apply classification and localization techniques in Deep Computer Vision environments
- Explore object detection and object tracking strategies using Convolutional Neural Networks

Module 12. Natural Language Processing (NLP) with Recurrent Neural Networks (RNN) and Attention

- Develop skills in text generation using Recurrent Neural Networks (RNN)
- Apply RNNs in opinion classification for sentiment analysis in texts
- Understand and apply attentional mechanisms in natural language processing models
- Analyze and use Transformers models in specific NLP tasks
- Explore the application of Transformers models in the context of image processing and computer vision
- Become familiar with the Hugging Face's Transformers library for efficient implementation of advanced models
- Compare different Transformers libraries to evaluate their suitability for specific tasks
- Develop a practical application of NLP that integrates RNN and attention mechanisms to solve real-world problems

Module 13. Autoencoders, GANs, and Diffusion Models

- Develop efficient representations of data using Autoencoders, GANs and Diffusion Models
- Perform PCA using an incomplete linear autoencoder to optimize data representation
- Implement and understand the operation of stacked autoencoders
- Explore and apply convolutional autoencoders for efficient visual data representations
- Analyze and apply the effectiveness of sparse automatic encoders in data representation
- Generate fashion images from the MNIST dataset using Autoencoders
- Understand the concept of Generative Adversarial Networks (GANs) and Diffusion Models
- Implement and compare the performance of Diffusion Models and GANs in data generation

Module 14. Bio-Inspired Computing

- Introduce the fundamental concepts of bio-inspired computing
- Analyze space exploration-exploitation strategies in genetic algorithms
- Examine models of evolutionary computation in the context of optimization
- Continue detailed analysis of evolutionary computation models
- Apply evolutionary programming to specific learning problems
- Address the complexity of multi-objective problems in the framework of bio-inspired computing
- Explore the application of neural networks in the field of bio-inspired computing
- Delve into the implementation and usefulness of neural networks in bio-inspired computing

Module 15. Artificial Intelligence: Strategies and Applications

- Develop strategies for the implementation of artificial intelligence in financial services
- Identify and assess the risks associated with the use of AI in the healthcare field
- Assess the potential risks associated with the use of AI in industry
- Apply artificial intelligence techniques in industry to improve productivity
- Design artificial intelligence solutions to optimize processes in public administration
- Evaluate the implementation of AI technologies in the education sector
- Apply artificial intelligence techniques in forestry and agriculture to improve productivity
- Optimize human resources processes through the strategic use of artificial intelligence

Module 16. Clinical Data Processing for Predictive Modeling in Aesthetic Medicine

- Securely store clinical and aesthetic data, integrating medical devices and wearables into advanced databases
- Master data cleansing, normalization, and preprocessing techniques to remove inconsistencies or biases
- Design medical imaging data structures to train neural networks and predictive models
- Apply Machine Learning algorithms to develop customized models that accurately anticipate aesthetic outcomes

Module 17. Modeling and Simulation in Aesthetic Medicine

- Gain proficiency in three-dimensional simulation of aesthetic procedures, from facial rejuvenation to body contouring
- Generate realistic 3D models based on anatomical data and individual patient characteristics
- Visualize real-time projections of non-invasive and surgical treatments, enhancing aesthetic planning
- Implement analysis of parameters such as facial symmetry, body volume and skin regeneration to optimize results

Module 18. Diagnosis and Analysis with Artificial Intelligence in Aesthetic Medicine

- Apply Artificial Intelligence methods for advanced diagnosis of skin anomalies, sun damage and facial aging
- Implement predictive models to evaluate skin tone, texture and firmness in different types of people
- Use neural networks to classify lesions, scars and other aesthetic problems, facilitating the personalization of treatments
- Evaluate skin responses to therapies and products using advanced analysis tools

Module 19. Personalization and Optimization of Aesthetic Treatments with Artificial Intelligence

- Design personalized treatments tailored to the unique characteristics of each patient, integrating clinical analysis and external factors
- Optimize filler, peel and rejuvenation procedures based on predictive simulations
- Adjust skin care routines according to individual needs and environmental conditions
- Implement innovative protocols to maximize efficacy and satisfaction in aesthetic results

Module 20. Artificial Intelligence for Monitoring and Maintenance in Aesthetic Medicine

- Monitor post-treatment results using advanced data visualization and analysis tools
- Detect early adverse effects and adjust maintenance protocols based on predictive data
- Evaluate adherence to aesthetic routines and make personalized recommendations to optimize long-term outcomes
- Ensure a continuous and documented follow-up of patients' evolution through Artificial Intelligence and interactive dashboards

05

Career Opportunities

The Professional Master's Degree in Artificial Intelligence in Aesthetic Medicine offers a unique opportunity for medical professionals to update and master emerging technologies, raising the quality of their clinical procedures. Graduates will develop advanced skills in sophisticated techniques such as algorithms, predictive modeling and machine learning, enabling them to them to personalize therapeutic plans and provide solutions that increase patients' long-term satisfaction and quality of life.

Are you looking to work as an Innovation Manager in Aesthetic Medicine? Achieve it with this program in just 12 months"

Graduate Profile

Graduates of this university program will be highly qualified to incorporate Artificial Intelligence technological tools in aesthetic clinical environments. They will master techniques such as the use of algorithms to improve the precision of treatments, efficiently manage resources and predict the results of clinical interventions. In addition, they will manage intelligent systems that monitor patients' condition in real time, allowing early detection of any anomaly.

You will create applications based on Artificial Intelligence for the personalization of aesthetic treatments and data analysis.

- **Technological Innovation in Aesthetic Medicine:** Ability to implement Artificial Intelligence tools in aesthetic procedures, optimizing results and customizing treatments according to patient needs
- **Data-Driven Decision Making:** Ability to use data obtained through intelligent systems to develop accurate diagnoses and design effective treatment plans
- **Ethical Commitment and Safety in Advanced Technologies:** Responsibility in the application of ethical and privacy regulations in the use of technological tools, ensuring confidentiality and protection of user data
- **Critical Thinking in Aesthetic Solutions:** Skill in assessing and solving clinical challenges through the use of Artificial Intelligence, ensuring safe procedures tailored to patients' expectations

After completing the program, you will be able to use your knowledge and skills in the following positions:

1. **Specialist in Technological Innovation in Aesthetic Medicine:** In charge of integrating and managing Artificial Intelligence solutions in aesthetic clinics to improve both the efficiency of treatments and the patient experience.
2. **Physician in Charge of Aesthetic Data Management:** Manages large volumes of aesthetic data using Artificial Intelligence techniques, ensuring its analysis and protection to optimize clinical care.
3. **Aesthetic Telemedicine with Artificial Intelligence Physician:** Their work consists of remote monitoring of patients requiring aesthetic therapies, using deep learning tools for continuous evaluation of results and preventive intervention.
4. **Consultant in Artificial Intelligence Healthcare Projects:** Dedicated to the implementation of Artificial Intelligence in healthcare environments, collaborating with multidisciplinary teams to ensure that technological solutions are adapted to clinical needs.
5. **Manager of Personalized Treatment with Artificial Intelligence:** Focuses on designing and managing individualized care plans, using Artificial Intelligence algorithms to adapt to the specific needs of each individual.
6. **Supervisor of Innovation Projects in Aesthetic Medicine:** Leads initiatives that seek to incorporate Artificial Intelligence into clinical practice, improving workflows and optimizing care resources considerably.
7. **Expert in Safety and Ethics in Aesthetic Artificial Intelligence:** Masters the regulations and ethics applied to the use of intelligent systems in healthcare, in addition to mitigating risks related to privacy and data management.

06

Study Methodology

TECH is the world's first university to combine the **case study** methodology with **Relearning**, a 100% online learning system based on guided repetition.

This disruptive pedagogical strategy has been conceived to offer professionals the opportunity to update their knowledge and develop their skills in an intensive and rigorous way. A learning model that places students at the center of the educational process giving them the leading role, adapting to their needs and leaving aside more conventional methodologies.

TECH will prepare you to face new challenges in uncertain environments and achieve success in your career"

The student: the priority of all TECH programs

In TECH's study methodology, the student is the main protagonist.
The teaching tools of each program have been selected taking into account the demands of time, availability and academic rigor that, today, not only students demand but also the most competitive positions in the market.

With TECH's asynchronous educational model, it is students who choose the time they dedicate to study, how they decide to establish their routines, and all this from the comfort of the electronic device of their choice. The student will not have to participate in live classes, which in many cases they will not be able to attend. The learning activities will be done when it is convenient for them. They can always decide when and from where they want to study.

> *At TECH you will NOT have live classes (which you might not be able to attend)"*

The most comprehensive study plans at the international level

TECH is distinguished by offering the most complete academic itineraries on the university scene. This comprehensiveness is achieved through the creation of syllabi that not only cover the essential knowledge, but also the most recent innovations in each area.

By being constantly up to date, these programs allow students to keep up with market changes and acquire the skills most valued by employers. In this way, those who complete their studies at TECH receive a comprehensive education that provides them with a notable competitive advantage to further their careers.

And what's more, they will be able to do so from any device, pc, tablet or smartphone.

> *TECH's model is asynchronous, so it allows you to study with your pc, tablet or your smartphone wherever you want, whenever you want and for as long as you want"*

Case Studies and Case Method

The case method has been the learning system most used by the world's best business schools. Developed in 1912 so that law students would not only learn the law based on theoretical content, its function was also to present them with real complex situations. In this way, they could make informed decisions and value judgments about how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

With this teaching model, it is students themselves who build their professional competence through strategies such as Learning by Doing or Design Thinking, used by other renowned institutions such as Yale or Stanford.

This action-oriented method will be applied throughout the entire academic itinerary that the student undertakes with TECH. Students will be confronted with multiple real-life situations and will have to integrate knowledge, research, discuss and defend their ideas and decisions. All this with the premise of answering the question of how they would act when facing specific events of complexity in their daily work.

Relearning Methodology

At TECH, case studies are enhanced with the best 100% online teaching method: Relearning.

This method breaks with traditional teaching techniques to put the student at the center of the equation, providing the best content in different formats. In this way, it manages to review and reiterate the key concepts of each subject and learn to apply them in a real context.

In the same line, and according to multiple scientific researches, reiteration is the best way to learn. For this reason, TECH offers between 8 and 16 repetitions of each key concept within the same lesson, presented in a different way, with the objective of ensuring that the knowledge is completely consolidated during the study process.

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.

A 100% online Virtual Campus with the best teaching resources

In order to apply its methodology effectively, TECH focuses on providing graduates with teaching materials in different formats: texts, interactive videos, illustrations and knowledge maps, among others. All of them are designed by qualified teachers who focus their work on combining real cases with the resolution of complex situations through simulation, the study of contexts applied to each professional career and learning based on repetition, through audios, presentations, animations, images, etc.

The latest scientific evidence in the field of Neuroscience points to the importance of taking into account the place and context where the content is accessed before starting a new learning process. Being able to adjust these variables in a personalized way helps people to remember and store knowledge in the hippocampus to retain it in the long term. This is a model called Neurocognitive context-dependent e-learning that is consciously applied in this university qualification.

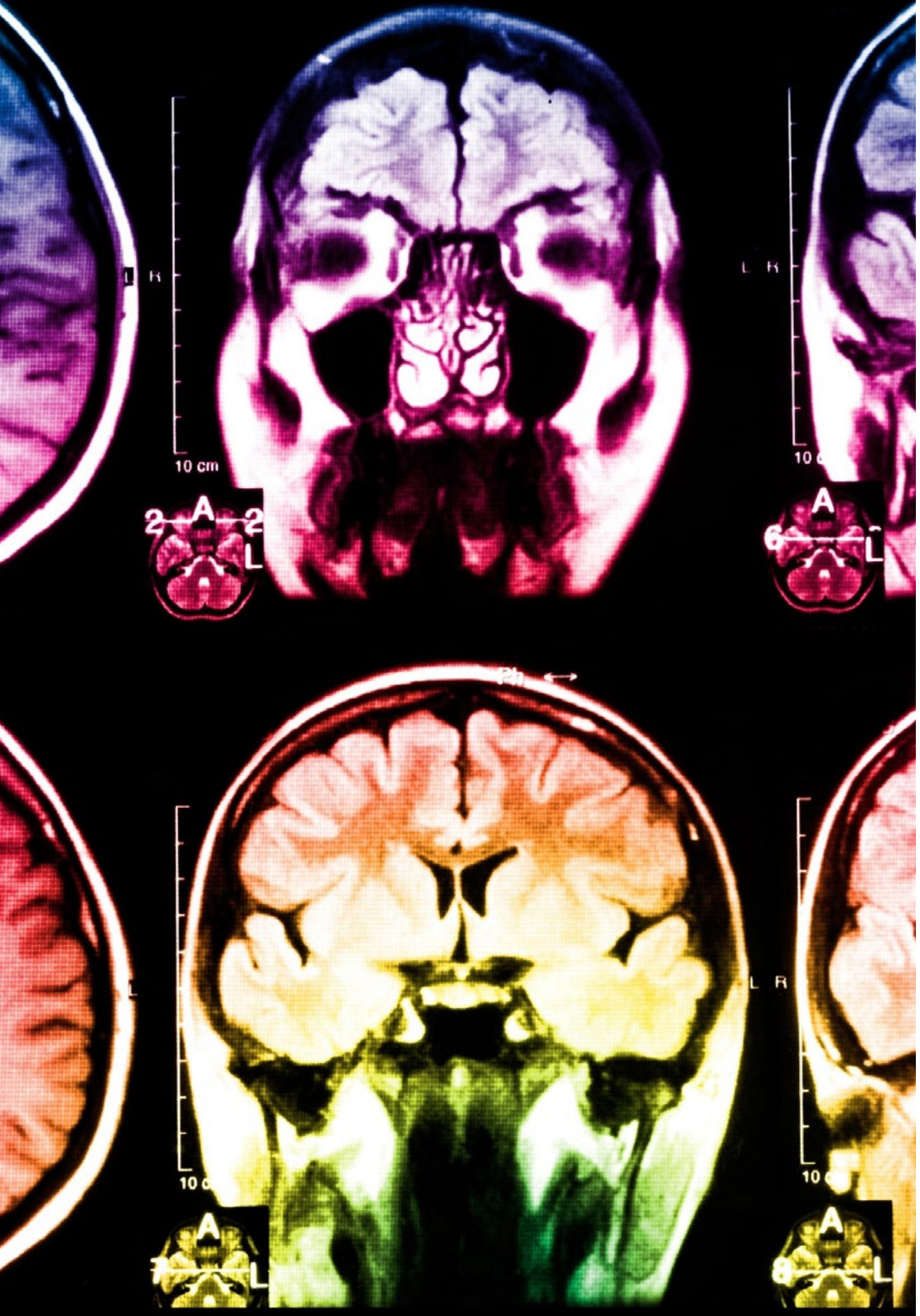
In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

Likewise, this very complete Virtual Campus will allow TECH students to organize their study schedules according to their personal availability or work obligations. In this way, they will have global control of the academic content and teaching tools, based on their fast-paced professional update.

> *The online study mode of this program will allow you to organize your time and learning pace, adapting it to your schedule"*

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 assess 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.



The university methodology top-rated by its students

The results of this innovative teaching model can be seen in the overall satisfaction levels of TECH graduates.

The students' assessment of the teaching quality, the quality of the materials, the structure of the program and its objectives is excellent. Not surprisingly, the institution became the top-rated university by its students according to the global score index, obtaining a 4.9 out of 5.

Access the study contents from any device with an Internet connection (computer, tablet, smartphone) thanks to the fact that TECH is at the forefront of technology and teaching.

You will be able to learn with the advantages that come with having access to simulated learning environments and the learning by observation approach, that is, Learning from an expert.

As such, the best educational materials, thoroughly prepared, will be available in this program:

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.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.

Practicing Skills and Abilities

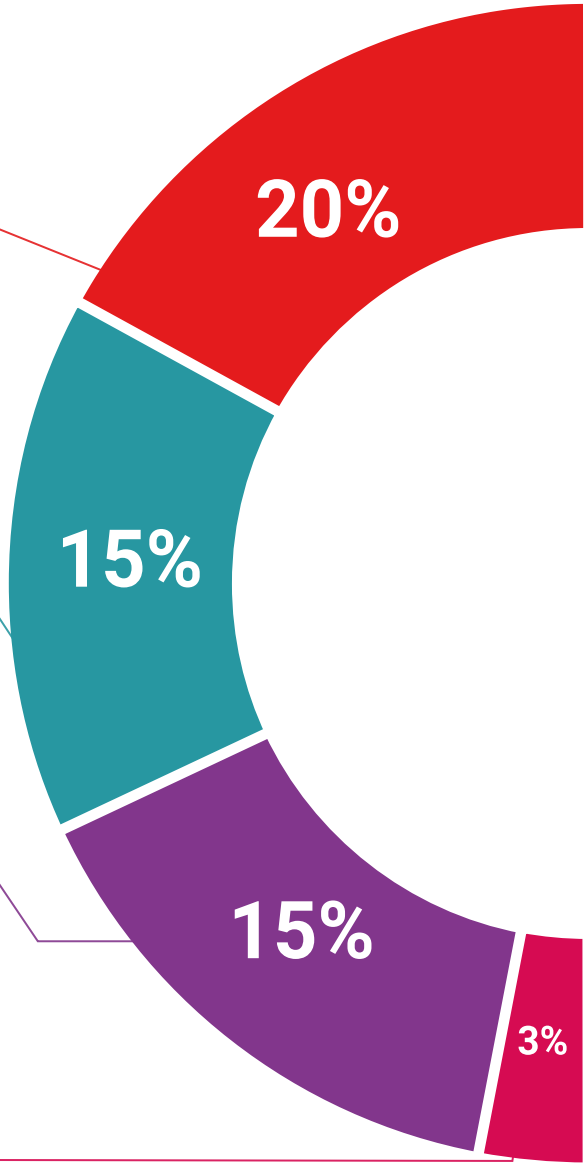
You will carry out activities to develop specific competencies and skills in each thematic field. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop within the framework of the globalization we live in.

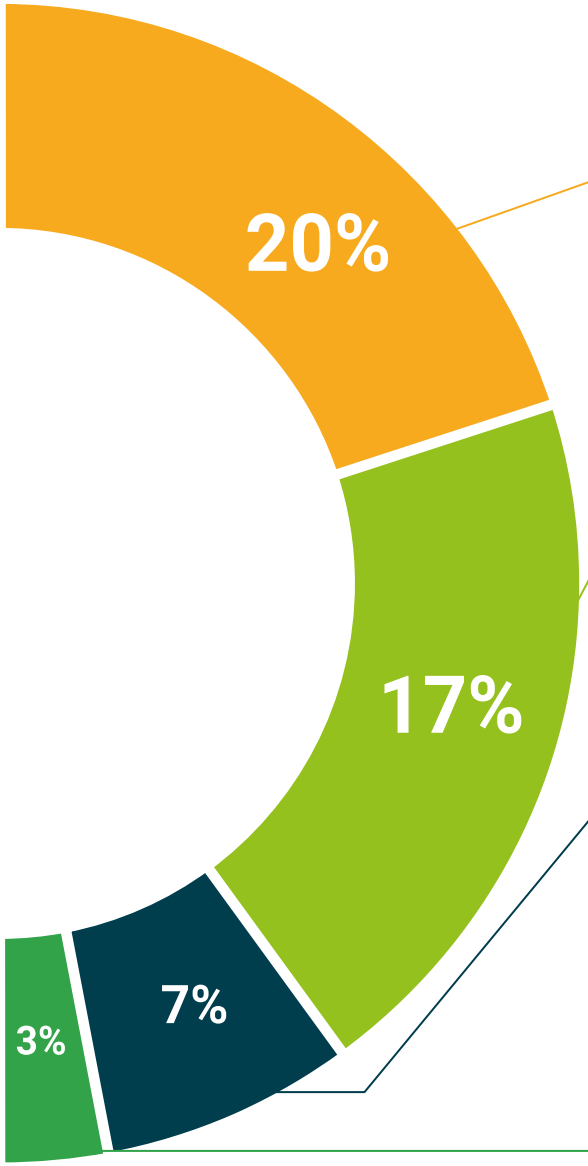
Interactive Summaries

We present 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, international guides... In our virtual library you will have access to everything you need to complete your education.





Case Studies

Students will complete a selection of the best case studies in the field.
Cases that are presented, analyzed, and supervised by the best specialists in the world.

Testing & Retesting

We periodically assess and re-assess your knowledge throughout the program. We do this on 3 of the 4 levels of Miller's Pyramid.

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 for 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.

07

Teaching Staff

TECH's fundamental premise is to make available to anyone the most complete and updated university programs in the academic panorama, which is why it rigorously selects its teaching staff. For the delivery of this Professional Master's Degree, TECH has enlisted the services of authentic references in the use of Artificial Intelligence in Aesthetic Medicine. Accordingly, they have developed a variety of teaching materials that stand out for their high quality and full adaptation to the demands of the labor market. As a result, graduates will have access to an immersive experience that will broaden their professional horizons.

You will enjoy the personalized advice of the teaching team, composed of experts in the application of Artificial Intelligence in Aesthetic Medicine"

Management

Dr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometeus Global Solutions
- CTO at Korporate Technologies
- CTO at AI Shepherds GmbH
- Consultant and Strategic Business Advisor at Alliance Medical
- Director of Design and Development at DocPath
- Doctorate in Psychology from the University of Castilla La Mancha
- Doctorate in Economics, Business and Finance from the Camilo José Cela University
- Doctorate in Psychology from University of Castilla La Mancha
- Master's Degree in Executive MBA from the Isabel I University
- Master's Degree in Sales and Marketing Management from the 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 Didactic and Scientific Content
- Nutritionist and Community Dietitian
- Community Pharmacist
- Researcher
- Master's Degree in Nutrition and Health from 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

Mr. Del Rey Sánchez, Alejandro

- Degree in Industrial Organization Engineering
- Certification in Big Data and Business Analytics
- Certification in Microsoft Excel Advanced, VBA, KPI and DAX
- Certification in CIS Telecommunication and Information Systems

Ms. Del Rey, Cristina

- Talent Management Administrator at Securitas Seguridad España, S.L.
- Extracurricular Activities Center Coordinator
- Support classes and pedagogical interventions with Primary and Secondary Education students
- Postgraduate in Development, Delivery and Tutoring of e-Learning Training Actions
- Postgraduate in Early Childhood Care
- Degree in Pedagogy from the Complutense University of Madrid

08

Certificate

The Professional Master's Degree in Artificial Intelligence in Aesthetic Medicine guarantees students, 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 **Professional Master's Degree in Artificial Intelligence in Aesthetic Medicine** 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: **Professional Master's Degree in Artificial Intelligence in Aesthetic Medicine**

Modality: **online**

Duration: **12 months**

Accreditation: **90 ECTS**


tech global university

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

Professional Master's Degree in Artificial Intelligence in Aesthetic Medicine

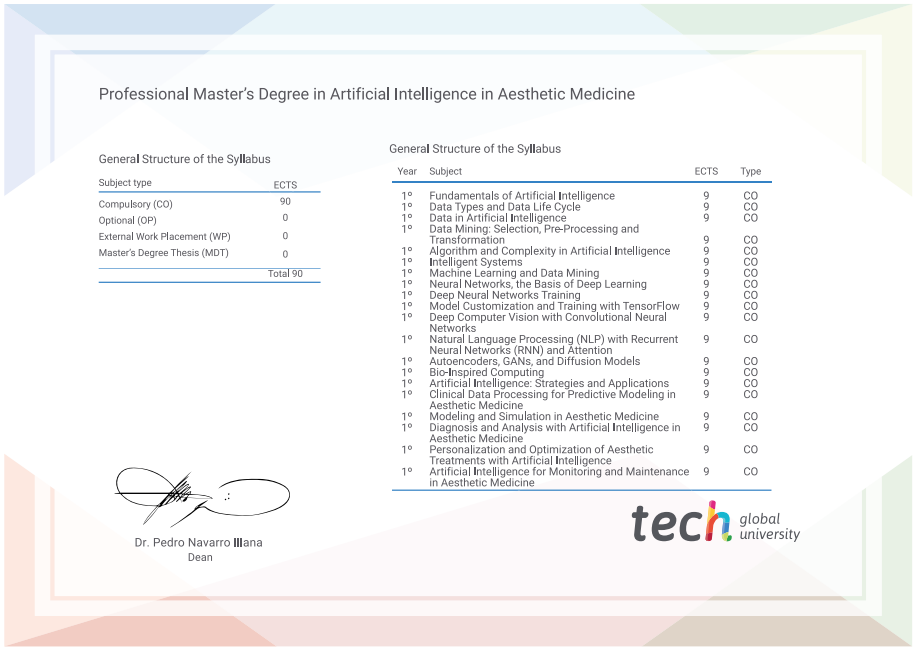
This is a private qualification of 2,700 hours of duration equivalent to 90 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

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

Unique TECH Code: AFWORD23S techtitute.com/certificates


Professional Master's Degree in Artificial Intelligence in Aesthetic Medicine

General Structure of the Syllabus

Subject type	ECTS
Compulsory (CO)	90
Optional (OP)	0
External Work Placement (WP)	0
Master's Degree Thesis (MDT)	0
	Total 90

General Structure of the Syllabus

Year	Subject	ECTS	Type
1º	Fundamentals of Artificial Intelligence	9	CO
1º	Data Types and Data Life Cycle	9	CO
1º	Data in Artificial Intelligence	9	CO
1º	Data Mining: Selection, Pre-Processing and Transformation	9	CO
1º	Algorithm and Complexity in Artificial Intelligence	9	CO
1º	Intelligent Systems	9	CO
1º	Machine Learning and Data Mining	9	CO
1º	Neural Networks, the Basis of Deep Learning	9	CO
1º	Deep Neural Networks Training	9	CO
1º	Model Customization and Training with TensorFlow	9	CO
1º	Deep Computer Vision with Convolutional Neural Networks	9	CO
1º	Natural Language Processing (NLP) with Recurrent Neural Networks (RNN) and Attention	9	CO
1º	Autoencoders, GANs, and Diffusion Models	9	CO
1º	Bio-Inspired Computing	9	CO
1º	Artificial Intelligence: Strategies and Applications	9	CO
1º	Clinical Data Processing for Predictive Modeling in Aesthetic Medicine	9	CO
1º	Modeling and Simulation in Aesthetic Medicine	9	CO
1º	Diagnosis and Analysis with Artificial Intelligence in Aesthetic Medicine	9	CO
1º	Personalization and Optimization of Aesthetic Treatments with Artificial Intelligence	9	CO
1º	Artificial Intelligence for Monitoring and Maintenance in Aesthetic Medicine	9	CO

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*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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Professional Master's Degree
Artificial Intelligence in Aesthetic Medicine

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Accreditation: **90 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Professional Master's Degree

Artificial Intelligence in Aesthetic Medicine

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