

# Hybrid Master's Degree

## Artificial Intelligence in Marketing and Communication



## Hybrid Master's Degree Artificial Intelligence in Marketing and Communication

Modality: Hybrid (Online + Internship)

Duration: 12 months

Certificate: TECH Global University

Accreditation: 60 + 4 ECTS

Website: [www.techtute.com/us/artificial-intelligence/hybrid-master-degree/hybrid-master-degree-artificial-intelligence-marketing-communication](http://www.techtute.com/us/artificial-intelligence/hybrid-master-degree/hybrid-master-degree-artificial-intelligence-marketing-communication)

# Index

01

Introduction

---

p. 4

02

Why Study this Hybrid Master's Degree?  
Objectives

---

p. 8

03

---

p. 12

04

Skills

---

p. 20

05

Course Management

---

p. 24

06

Educational Plan

---

p. 28

07

Clinical Internship

---

p. 46

08

Where Can I Do the Internship?

---

p. 52

09

Methodology

---

p. 56

10

Certificate

---

p. 64

# 01

# Introduction

Artificial Intelligence (AI) has become a key tool in Marketing and Communication, transforming the way companies interact with their audiences. In fact, platforms such as Google and Meta use advanced AI to optimize audience targeting, personalize ads and predict buying behavior, which significantly improves the return on advertising investment. Therefore, companies continue to adopt generative AI solutions, such as ChatGPT or DALL-E, which enable the generation of personalized texts, images and videos, boosting creativity and innovation in advertising campaigns. In this context, TECH has designed a comprehensive hybrid program, with a 100% online format for the theory and a practical stay of 3 weeks in a prestigious company.







“

*With this Hybrid Master's Degree, you will acquire specialized knowledge in the use of AI to optimize marketing strategies, automate processes and personalize the customer experience”*

The adoption of Artificial Intelligence in Marketing continues to rise, with tools that allow to optimize advertising campaigns in real time through predictive analytics and programmatic advertising. Chatbots and virtual assistants have improved customer service, offering instant and accurate responses, which has enhanced the user experience.

This is how this Hybrid Master's Degree is born, in which professionals will apply advanced machine learning tools to improve communication with customers, as well as personalize user experiences, both on websites and social networks. They will also develop skills in the creation and management of chatbots and virtual assistants, essential to optimize customer interaction and customer service.

Likewise, experts will acquire knowledge on the use of AI to improve search engine positioning (SEO and SEM), using predictive analytics and Big Data to create more effective Marketing strategies. In addition, they will specialize in the personalization and automation of Email Marketing campaigns, while examining emerging trends and staying at the forefront of the industry.

Finally, they will delve into the automation and optimization of Marketing processes through AI, with a focus on the integration of data and platforms to improve advertising campaigns through machine learning. In this sense, advanced technologies will be used for the analysis of large volumes of data, developing predictive analytics that facilitate informed decision-making.

In this way, TECH has developed a complete program that will be divided into two sections. The first, fully online, will focus on theory, using the revolutionary Relearning methodology, consisting of continuous reiteration of key concepts for optimal assimilation of content. The second section will consist of a 3-week practical internship in a leading company in the sector.

This **Hybrid Master's Degree in Artificial Intelligence in Marketing and Communication** contains the most complete and up-to-date program on the market. The most important features include:

- ♦ Development of more than 100 case studies presented by Artificial Intelligence professionals, experts in Marketing and Communication, as well as university professors with extensive experience in these fields
- ♦ Its graphic, schematic and eminently practical contents, with which they are conceived, gather essential information on those techniques and tools that are essential for professional practice
- ♦ All of this will be complemented by 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
- ♦ Furthermore, you will be able to carry out a internship in one of the best companies



*You'll be able to predict consumer needs using virtual assistants and other AI tools, optimizing lead generation and commercial strategies"*

“

*The 3-week hands-on experience will allow you to face real challenges, preparing you to lead innovation projects in the field of Digital Marketing with Artificial Intelligence”*

This Hybrid Master's Degree, which has a professionalizing nature and a blended learning modality, is aimed at updating Artificial Intelligence professionals who perform their duties in the Marketing and Communication Departments, and who require a high level of qualification. The contents are based on the latest scientific evidence, and oriented in a didactic way to integrate theoretical knowledge into practice, as well as the theoretical-practical elements will facilitate the updating of knowledge.

Thanks to its multimedia content elaborated with the latest educational technology, they will allow the Artificial Intelligence professional a situated and contextual learning, that is to say, a simulated environment that will provide an immersive learning programmed to prepare in real situations. This program is designed around Problem-Based Learning, whereby the physician must try to solve the different professional practice situations that arise during the course.

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

*You will develop chatbots, predictive analytics and automated campaigns, gaining technical skills that are in high demand in the industry, from the best digital university in the world, according to Forbes: TECH.*

*Upon completion, you will be prepared to take on strategic roles and lead the digital transformation in Marketing and Communication, increasing your opportunities for employment and professional growth.*



# 02

## Why Study this Hybrid Master's Degree?

This university program will allow graduates to develop advanced skills in the use of AI to optimize marketing campaigns, automate processes and improve interaction with customers, skills that are increasingly in demand. In addition, being hybrid learning, it offers the flexibility to learn from a distance without giving up valuable practical experience, providing specialization adapted to current professional needs. Therefore, they will be able to apply the knowledge in real practical cases, preparing to lead innovation projects in Digital Marketing and communication.





“

*Attending this Hybrid master's degree in Artificial Intelligence in Marketing and Communication will be a strategic decision for those who wish to position themselves at the forefront of digital transformation”*

### 1. Updating from the latest technology available

Generative AI solutions, such as GPT and DALL-E language models, enable the automated creation of highly personalized content, improving the efficiency of Marketing campaigns. In addition, advanced predictive analytics and Machine Learning tools help companies predict consumer behaviors and make more informed decisions in real time. Natural Language Processing (NLP) technologies are also being used to enhance chatbots and virtual assistants, ensuring a smoother and more personalized user experience when communicating with customers.

### 2. Gaining in-depth knowledge from the experience of top specialists

The large team of professionals that will accompany the specialist throughout the practical period is a first-class and an unprecedented guarantee of updating. With a specifically designated tutor, students will be able to see real patients in a state-of-the-art environment, which will allow them to incorporate the most effective procedures and approaches in Artificial Intelligence in Marketing and Communication into their daily practice.

### 3. Entering first-class professional environments

TECH carefully selects all available centers for Internship Programs. Thanks to this, specialists will have guaranteed access to a prestigious clinical environment in the area of Artificial Intelligence applied to Marketing and Communication. In this way, they will be able to experience the day-to-day of a demanding, rigorous and exhaustive area of work, always applying the latest strategies and tools in their work methodology.





#### 4. Combining the best theory with state-of-the-art practice

The academic market is plagued by teaching programs that are poorly adapted to the daily work of the specialist and that require long teaching hours, often not very compatible with personal and professional life. TECH offers a new learning model, 100% practical, that allows them to get in front of state-of-the-art procedures in the field of Artificial Intelligence applied to Marketing and Communication and, best of all, to put it into professional practice in just 3 weeks.

#### 5. Opening the door to new opportunities

By adopting AI tools, professionals can develop more effective campaigns, anticipate market trends and proactively respond to customer needs. In addition, companies that implement AI solutions can improve operational efficiency, reduce costs and increase their competitiveness in a crowded marketplace. This innovative approach not only opens new doors for professional growth and value creation, but also promotes a more agile and adaptive business culture.



*You will have full practical immersion at the center of your choice"*



# 03

## Objectives

Through a comprehensive specialization, this academic program will develop skills to implement advanced machine learning and data analysis, which allow to personalize the customer experience and automate Marketing processes. In addition, it will promote the understanding of how AI can improve strategic decision making, facilitating predictive analytics and audience segmentation. Another key objective will be to prepare graduates to lead innovation in their organizations, exploring emerging trends and applying technological solutions.





“

*You will analyze emerging trends in Artificial Intelligence and their potential impact on the future of Digital Marketing, thanks to an extensive library of innovative multimedia resources”*



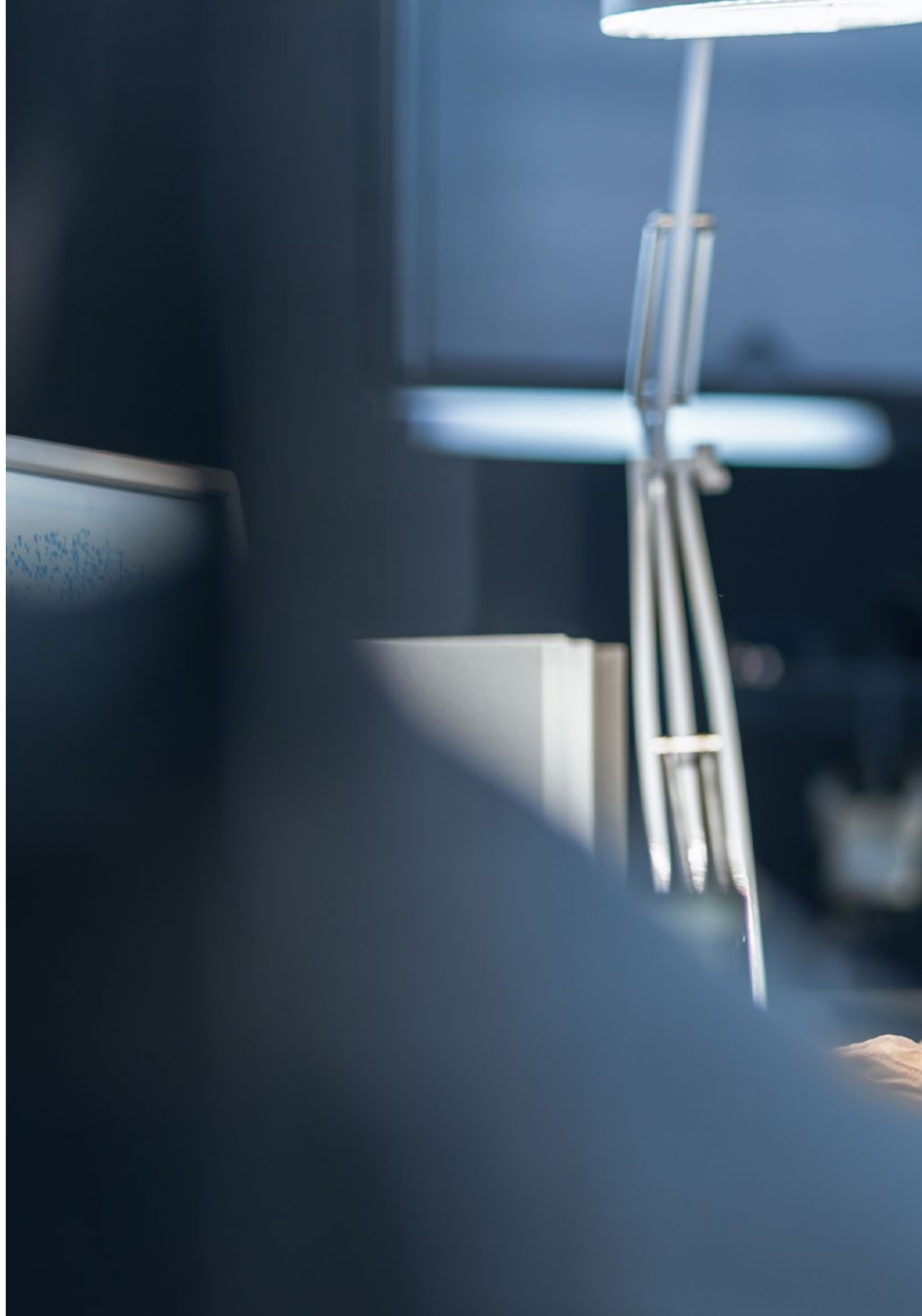
## General Objective

---

- The general objective that the Hybrid master's degree in Artificial Intelligence in Marketing and Communication will be to provide professionals with a deep understanding of how AI is revolutionizing Digital Marketing strategies. Therefore, they will develop, integrate and manage chatbots and virtual assistants, improving interaction with customers. In addition, they will delve into the automation and optimization of online ad buying through programmatic advertising, as well as the interpretation of large volumes of data for strategic decision making



*You will apply Artificial Intelligence in Email Marketing campaigns, optimizing their personalization and automation, through the best didactic materials, at the forefront of technology and education”*





## Specific Objectives

---

### Module 1. Fundamentals of Artificial Intelligence

- ◆ Understand the fundamental concepts of Artificial Intelligence applied to Digital Marketing, including its evolution and impact on business strategies
- ◆ Apply specific AI tools for search engine optimization, improving the visibility and effectiveness of digital campaigns
- ◆ Develop skills to implement chatbots and virtual assistants, improving customer interaction and personalization of experiences

### Module 2. Data Types and Life Cycle

- ◆ Perform the most descriptive statistics, taking into account factors ranging from the population to its sources
- ◆ Properly differentiate the data life cycle, taking into account the FAIR Principles
- ◆ Employ the Gantt Chart tool to manage both projects and communication of planning and scheduling tasks
- ◆ Perform data collection and data cleansing functions
- ◆ Acquire an extensive knowledge of regulatory issues such as the Data Protection Act

### Module 3. Data in Artificial Intelligence

- ◆ Implement advanced automation techniques, such as advertising campaign optimization and efficient CRM management with AI-based tools
- ◆ Develop skills in lead identification and qualification using AI, improving effectiveness in both lead generation and lead management
- ◆ Apply sentiment analysis with AI in social networks and customer feedback, optimizing interaction to improve brand perception



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

- ♦ Gain extensive insight into statistical inference
- ♦ Perform effective treatments of missing values, applying maximum likelihood imputation methods
- ♦ Select data based on major perspectives and criteria
- ♦ Drive data preprocessing work in Big Data environments

#### Module 5. Algorithm and Complexity in Artificial Intelligence

- ♦ Understand the fundamentals of algorithmics and computational complexity in the context of AI
- ♦ Become familiar with the key concepts of algorithms, data structures and algorithm design techniques used in applications
- ♦ Study and apply search, optimization and Machine Learning algorithms in AI problems
- ♦ Explore how existing algorithms can be improved and new algorithms developed to address AI challenges
- ♦ Develop practical skills in the implementation and evaluation of algorithms

#### Module 6. Intelligent Systems

- ♦ Analyze in depth the Theory of Agents, to know what factors influence AI and software engineering
- ♦ Perform an effective evaluation of data quality, keeping in mind the distinction between information and knowledge
- ♦ Build domain ontologies at a higher level and master their respective languages
- ♦ Delve into the current and future state of the semantic web in order to carry out innovation processes







### **Module 7. Machine Learning and Data Mining**

- ◆ Delve deeply into the key concepts of Machine Learning discovery processes
- ◆ Explore data processing, visualization and exploration of variables
- ◆ Appropriately master the mechanisms of Neural Networks, using the Backpropagation Algorithm
- ◆ Analyze text mining and natural language processing

### **Module 8. Neural Networks, the Basis of Deep Learning**

- ◆ Obtain a comprehensive view on Deep Learning and its various applications in the communication domain
- ◆ Design architectures taking into account the connection between layers and forward propagation
- ◆ Build Neural Networks establishing both weights and training
- ◆ Apply the basic principles of Neural Networks, adjusting parameters as necessary.
- ◆ Implement MLP with Keras

### **Module 9. Deep Neural Networks Training**

- ◆ Identify Gradient problems and perform techniques to optimize them
- ◆ Perform learning rate scheduling by applying smoothing terms
- ◆ Acquire practical guidelines in model design, selection of metrics and evaluation parameters
- ◆ Execute maximum entropy regularization procedures

### Module 10. Model Customization and Training with TensorFlow

- ◆ Conduct model training with TensorFlow, performing operations with graphs
- ◆ Effectively customize models and training algorithms
- ◆ Gain a broad understanding of TensorFlow functions and graphs
- ◆ Use the tfdata API for data processing
- ◆ Elaborate Deep Learning applications with the most advanced TensorFlow tools

### Module 11. Deep Computer Vision with Convolutional Neural Networks

- ◆ Master the Visual Cortex Architecture, taking into account the functions of the visual cortex and the theories of computer vision
- ◆ Implement a CNN ResNet using Keras
- ◆ Perform transfer learning processes, knowing its advantages
- ◆ Execute object detection methods and tracking techniques

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

- ◆ Generate texts using RNN and handle their natural language in an optimal way
- ◆ Create training data sets and perform the corresponding cleaning and transformation of the information
- ◆ Use encoder-decoder networks for machine translation
- ◆ Employ Transformer Models for language vision
- ◆ Develop NLP applications with RNN and Attention

### Module 13. Autoencoders, GANs and Diffusion Models

- ◆ Represent data in an efficient way, reducing dimensionality through deep learning.
- ◆ Perform PCA processes with an incomplete linear autoencoder
- ◆ Eliminate noise from automatic encoders by applying filters and regularization techniques
- ◆ Generate fashion MNIST images
- ◆ Understand generative adversarial networks and diffusion models

### Module 14. Bio-Inspired Computing

- ◆ Efficiently employ social adaptation algorithms using ant colony and particle cloud-based computing
- ◆ Apply space exploration-exploitation strategies for genetic algorithms
- ◆ Delve into the different models of evolutionary computation
- ◆ Understand the various uses of Neural Networks in fields such as medical research, economics or computer vision

### Module 15. Artificial Intelligence: Strategies and Applications

- ◆ Address the implications of AI in financial services, to overcome challenges and take advantage of opportunities
- ◆ Understand the implications of Machine Learning in healthcare services, Retail, Education and Public Administrations
- ◆ Analyze the latest trends in this field and analyze their challenges for the future

**Module 16. Artificial Intelligence in Digital Marketing Strategies**

- ◆ Perform Digital Marketing transformation processes with AI
- ◆ Control the most advanced tools of Machine Learning for customer communication
- ◆ Personalize users' experiences on websites and social media
- ◆ Develop chatbots and virtual assistants in Digital Marketing

**Module 17. Content Generation with AI**

- ◆ Master AI systems for SEO and SEM optimization
- ◆ Execute Predictive Analytics and use Big Data in Digital Marketing
- ◆ Use Email Marketing for Personalization and Automation in Campaigns
- ◆ Analyze future trends in AI for Digital Marketing

**Module 18. Automation and Optimization of Marketing Processes with AI**

- ◆ Develop Marketing Automation Processes with AI
- ◆ Integrate data and platforms in Automated Marketing Strategies
- ◆ Optimize advertising campaigns through Machine Learning
- ◆ Analyze sentiment with AI on social networks, leveraging customer feedback

**Module 19. Communication and Marketing Data Analysis for Decision Making**

- ◆ Master specific technologies for the analysis of Communication and Marketing data
- ◆ Apply AI to the analysis of large volumes of data
- ◆ Develop Predictive Analytics for informed decision making
- ◆ Improve Marketing strategies with AI

**Module 20. Sales and Leads Generation with Artificial Intelligence**

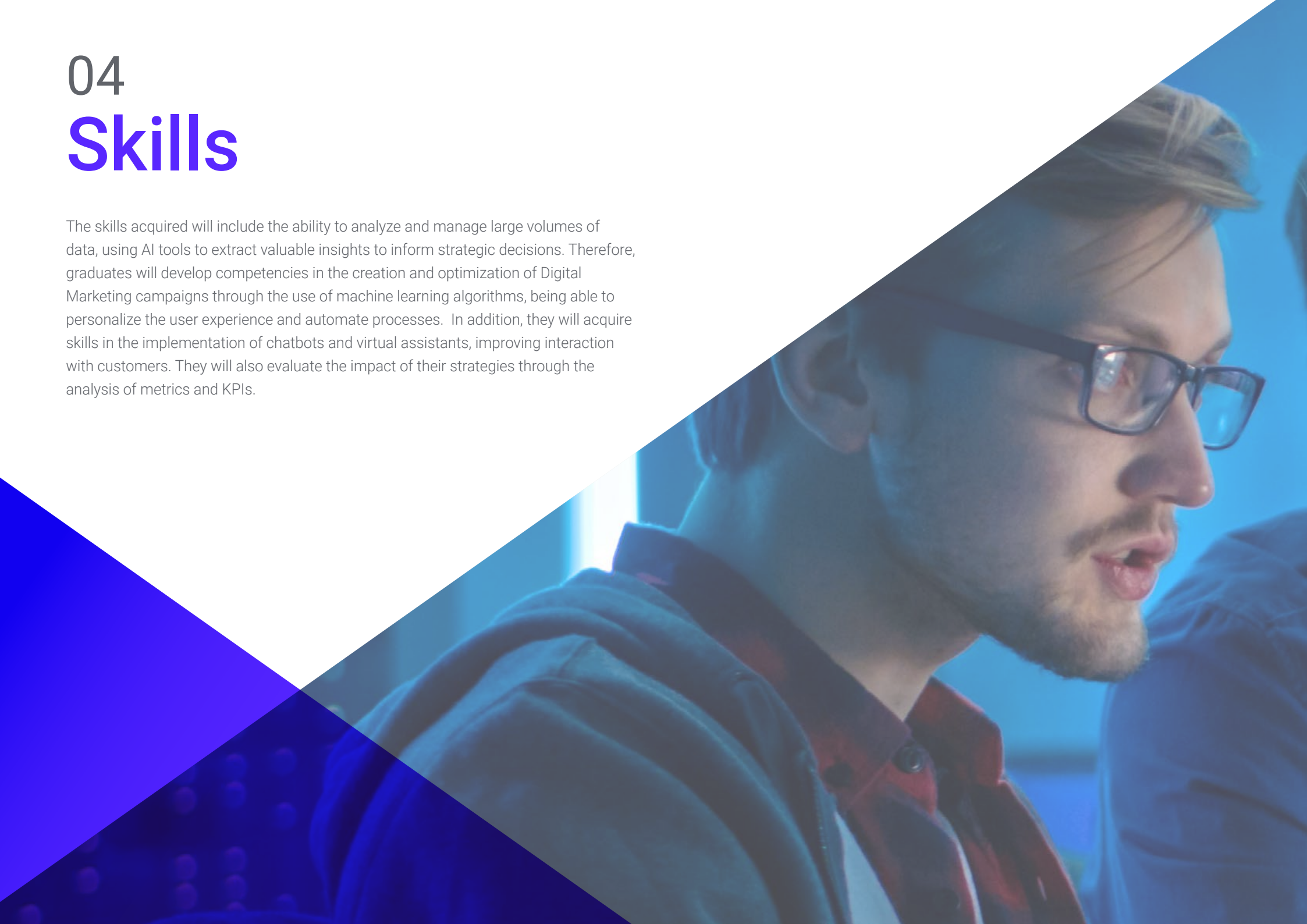
- ◆ Nurture Leads generation tools and procedures with AI
- ◆ Implement Virtual Assistants in sales processes
- ◆ Predict consumer needs through Machine Learning
- ◆ Learn about the main innovations and predictions in the sales field



*Delve into the most relevant theory in this field, subsequently applying it in a real work environment"*

# 04 Skills

The skills acquired will include the ability to analyze and manage large volumes of data, using AI tools to extract valuable insights to inform strategic decisions. Therefore, graduates will develop competencies in the creation and optimization of Digital Marketing campaigns through the use of machine learning algorithms, being able to personalize the user experience and automate processes. In addition, they will acquire skills in the implementation of chatbots and virtual assistants, improving interaction with customers. They will also evaluate the impact of their strategies through the analysis of metrics and KPIs.





A man with glasses and a blue shirt is looking at a screen in a server room. The background is filled with server racks and blue lighting. The image is split diagonally into a blue upper-left section and a white lower-right section.

“

*This Hybrid Master's Degree in Artificial Intelligence in Marketing and Communication equips students with key skills that are essential in today's digital environment”*

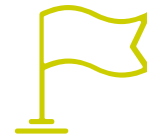


## General Skills

---

- Apply AI tools to optimize SEO, SEM and improve search engine visibility
- Implement automation and predictive analytics in social networks to boost online presence
- Use AI content generation tools for text, images, music and video in Marketing contexts
- Personalize user experiences on websites and applications using advanced AI techniques
- Develop, integrate and manage chatbots and virtual assistants to improve customer interactions





## Specific Skills

---

- Create effective ChatGPT prompts and get targeted results in content generation
- Apply tools such as Midjourney for image creation, and Fliki for video generation, developing practical skills in visual content creation with AI
- Apply AI sentiment analysis to social media and customer feedback, optimizing interaction and improving brand awareness
- Master the automation and optimization of online ad buying through programmatic advertising with AI
- Apply Email Marketing strategies to automate campaigns

“

*These skills will prepare you to lead innovation and digital transformation projects in your organization, always with the support of the revolutionary Relearning learning methodology”*



# 05

# Course Management

The teaching team is composed of highly qualified professionals with extensive experience in their respective areas. In fact, these experts not only have strong academic backgrounds, but have also worked in the industry, offering a practical and up-to-date perspective on emerging trends and technologies in digital marketing and artificial intelligence. In addition, they are committed to the professional development of the graduates, providing mentoring and guidance to help them apply their knowledge in the working world.





“

*The faculty's approach will foster dynamic and collaborative learning, using real case studies and innovative tools that will facilitate the understanding of complex concepts”*

## Management



### Dr. Peralta Martín-Palomino, Arturo

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



### Mr. Sánchez Mansilla, Rodrigo

- ♦ Digital Advisor at AI Shepherds GmbH
- ♦ Digital Account Manager at Kill Draper
- ♦ Head of Digital at Kuarere
- ♦ Digital Marketing Manager at Arconi Solutions, Deltoid Energy and Brinergy Tech
- ♦ *Founder and National Sales and Marketing Manager*
- ♦ Master's Degree in Digital Marketing (MDM) by The Power Business School
- ♦ Bachelor's Degree in Business Administration (BBA) from the University of Buenos Aires

## Professors

### Ms. González Risco, Verónica

- ♦ Freelance Digital Marketing Consultant
- ♦ Product Marketing/International Business Development at UNIR - The University on the Internet
- ♦ Digital Marketing Specialist at Código Kreativo Comunicación SL
- ♦ Professional Master's Degree in Online Marketing and Advertising Management by Indisoft- Upgrade
- ♦ Diploma in Business Studies from the University of Almería

### Ms. Parreño Rodríguez, Adelaida

- ♦ Technical Developer & Energy Communities Engineer at the University of Murcia
- ♦ Technical Developer & Energy Communities Engineer at the University of Murcia
- ♦ Manager in Research & Innovation in European Projects at the University of Murcia
- ♦ Content Creator in Global UC3M Challenge
- ♦ Ginés Huertas Martínez Award (2023)
- ♦ Master's Degree in Renewable Energies by the Polytechnic University of Cartagena
- ♦ Degree in Electrical Engineering (bilingual) from the Carlos III University of Madrid

06

# Educational Plan

Through this program, professionals will use machine learning technologies to transform marketing strategies, personalizing user experiences and optimizing communication with customers. They will also delve into the generation of automated content and the application of predictive analytics and Big Data for informed decision making. In addition, they will be able to develop chatbots and virtual assistants, as well as automate marketing processes to improve the efficiency and effectiveness of campaigns.



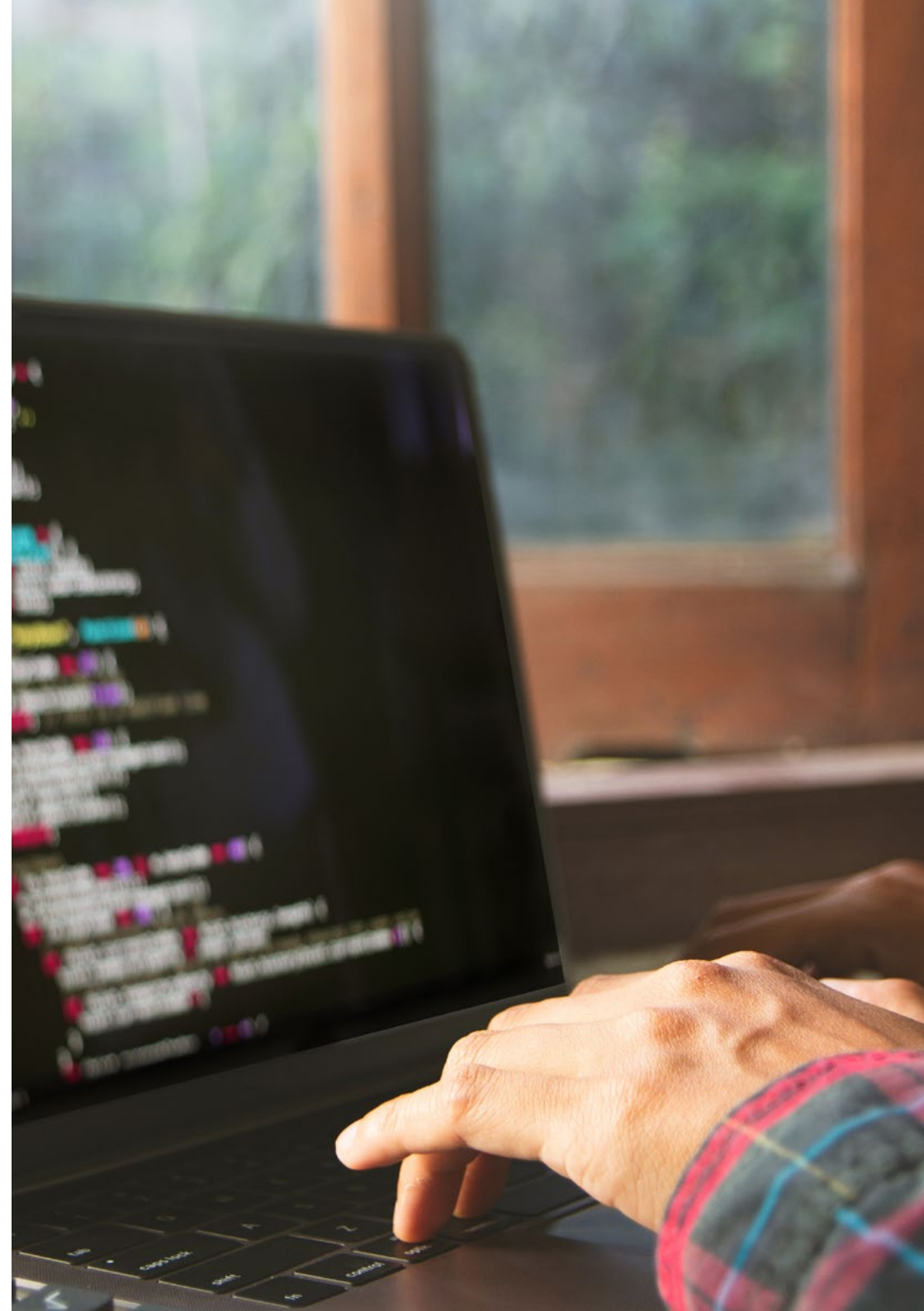


“

*This Hybrid Master's Degree will offer a comprehensive content that will cover several key areas to master the intersection between Artificial Intelligence and Digital Marketing”*

## 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 Dialog 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 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 their 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. Discret 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. Criteria for Mathematical Analysis of 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. Merge Sort
  - 5.3.6. 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 Matrixes
  - 7.4.2. Numerical Evaluation Matrixes
  - 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. Surgery
  - 8.2.1. Sum
  - 8.2.2. Product
  - 8.2.3. Transfer
- 8.3. Layers
  - 8.3.1. Input Layer
  - 8.3.2. Cloak
  - 8.3.3. Output Layer
- 8.4. Layer Bonding 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. Learning Transfer 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. Learning Transfer 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. Learning Transfer 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. Preprocessing Data with TensorFlow
    - 10.5.3. Using TensorFlow Tools for Data Manipulation
  - 10.6. The Tfdata API
    - 10.6.1. Using the Tfdata API for Data Processing
    - 10.6.2. Construction of Data Streams with Tfdata
    - 10.6.3. Using the Tfdata 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 Preprocessing Layers
    - 10.8.1. Using the Keras Preprocessing API
    - 10.8.2. Preprocessing Pipelined Construction with Keras
    - 10.8.3. Using the Keras Preprocessing API for Model Training
  - 10.9. The TensorFlow Datasets Project
    - 10.9.1. Using TensorFlow Datasets for Data Loading
    - 10.9.2. Preprocessing Data 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 Applications
    - 10.10.2. Building a Deep Learning App with TensorFlow
    - 10.10.3. Model Training with TensorFlow
    - 10.10.4. Use of 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. Learning by Transfer
  - 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
  - 11.10.1. Edge Detection
  - 11.10.1. 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 Preprocessing
  - 12.7.3. Training a Transformers Model for Vision
- 12.8. Hugging Face's Transformers Bookstore
  - 12.8.1. Using the 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 Applications
  - 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
  - 14.1.1. 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 Uses
  - 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 the Healthcare Service
  - 15.2.1. Implications of AI in the Healthcare Sector Opportunities and Challenges
  - 15.2.2. Case Uses
- 15.3. Risks Related to the Use of AI in the Health 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 Uses
  - 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 Uses
- 15.6. Potential Risks Related to the Use of AI in Industry
  - 15.6.1. Case Uses
  - 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 Uses
  - 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 Uses
  - 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 Uses
  - 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 for Human Resources Opportunities and Challenges
  - 15.10.2. Case Uses
  - 15.10.3. Potential Risks Related to the Use of AI
  - 15.10.4. Potential Future Developments/Uses of AI

## Module 16. Artificial Intelligence in Digital Marketing Strategies

- 16.1. Digital Marketing Transformation with AI and ChatGPT
  - 16.1.1. Introduction to Digital Transformation
  - 16.1.2. Impact on Content Strategy
  - 16.1.3. Automation of Marketing Processes
  - 16.1.4. Development of Customer Experience
- 16.2. AI Tools for SEO and SEM: KeywordInsights and DiiB
  - 16.2.1. Keyword Optimization with AI
  - 16.2.2. Competition Analysis
  - 16.2.3. Search Trend Forecast
  - 16.2.4. Intelligent Audience Segmentation
- 16.3. IA Application in Social Media
  - 16.3.1. Sentiment Analysis with MonkeyLearn
  - 16.3.2. Social Trend Detection
  - 16.3.3. Publication Automation with Metricool
  - 16.3.4. Automated Content Generation with PreDis
- 16.4. AI tools for Customer Communication
  - 16.4.1. Custom Chatbots using Dialogflow
  - 16.4.2. Automated Email Response Systems using Mailchimp
  - 16.4.3. Real-Time Response Optimization using Freshchat
  - 16.4.4. Customer Feedback Analysis using SurveyMonkey
- 16.5. Personalization of the User Experience of AI-enabled Tools and Websites
  - 16.5.1. Personalized Recommendations
  - 16.5.2. User Interface Adaptation
  - 16.5.3. Dynamic Audience Segmentation
  - 16.5.4. Intelligent A/B Testing with VWO (Visual Website Optimizer)
- 16.6. Chatbots and Virtual Assistants in Marketing Digital
  - 16.6.1. Proactive Interaction with MobileMonkey
  - 16.6.2. Multichannel Integration using Tars
  - 16.6.3. Contextual Responses with Chatfuel
  - 16.6.4. Conversation Analytics using Botpress
- 16.7. Programmatic Advertising with AI
  - 16.7.1. Advanced Segmentation with Adroll
  - 16.7.2. Real-Time Optimization using WordStream
  - 16.7.3. Automatic Bidding using BidIQ
  - 16.7.4. Analysis of Results
- 16.8. Predictive Analytics and Big Data in Digital Marketing
  - 16.8.1. Market Trends Forecast
  - 16.8.2. Advanced Attribution Models
  - 16.8.3. Predictive Audience Segmentation
  - 16.8.4. Sentiment Analysis in Big Data
- 16.9. AI and Email Marketing for Campaign Customization and Automation
  - 16.9.1. Dynamic List Segmentation
  - 16.9.2. Dynamic Content in Emails
  - 16.9.3. Workflow Automation with Brevo
  - 16.9.4. Optimizing Open Rate with Benchmark Email

- 16.10. Future Trends in AI for Digital Marketing
  - 16.10.1. Advanced Conversational AI
  - 16.10.2. Augmented Reality Integration using ZapWorks
  - 16.10.3. Emphasis on AI Ethics
  - 16.10.4. AI in Content Creation

## Module 17. Content Generation with AI

- 17.1. Prompt Engineering in ChatGPT
  - 17.1.1. Quality Improvement of the Generated Content
  - 17.1.2. Model Performance Optimization Strategies
  - 17.1.3. Effective Prompts Design
- 17.2. AI Image Generation Tools through ChatGPT
  - 17.2.1. Object Recognition and Generation
  - 17.2.2. Applying Custom Styles and Filters to Images
  - 17.2.3. Methods to Improve the Visual Quality of Images
- 17.3. Video Creation with AI
  - 17.3.1. Tools to Automate Video Editing
  - 17.3.2. Voice Synthesis and Automatic Dubbing
  - 17.3.3. Techniques for Object Tracking and Animation
- 17.4. AI Text Generation for Blogging and Social Media Creation through ChatGPT
  - 17.4.1. Strategies for Improving SEO Positioning in Generated Content
  - 17.4.2. Using AI to Predict and Generate Content Trends
  - 17.4.3. Creating Attractive Headlines
- 17.5. Personalization of AI Content to Different Audiences Using Optimizely
  - 17.5.1. Identification and Analysis of Audience Profiles
  - 17.5.2. Dynamic Adaptation of Content according to User Profiles
  - 17.5.3. Predictive Audience Segmentation
- 17.6. Ethical Considerations for the Responsible Use of AI in Content Generation
  - 17.6.1. Transparency in Content Generation
  - 17.6.2. Preventing Bias and Discrimination in Content Generation
  - 17.6.3. Control and Human Supervision in Generative Processes

- 17.7. Analysis of Successful Cases in Content Generation with AI
  - 17.7.1. Identification of Key Strategies in Successful Cases
  - 17.7.2. Adaptation to Different Sectors
  - 17.7.3. Importance of Collaboration between AI Specialists and Industry Practitioners
- 17.8. Integration of AI-Generated Content in Digital Marketing Strategies
  - 17.8.1. Optimization of Advertising Campaigns with Content Generation
  - 17.8.2. Personalization of User Experience
  - 17.8.3. Automation of Marketing Processes
- 17.9. Future Trends in Content Generation with AI
  - 17.9.1. Advanced and Seamless Text, Image and Audio Integration
  - 17.9.2. Hyper-Personalized Content Generation
  - 17.9.3. Improved AI Development in Emotion Detection
- 17.10. Evaluation and Measurement of the Impact of AI-Generated Content
  - 17.10.1. Appropriate Metrics to Evaluate the Performance of Generated Content
  - 17.10.2. Measurement of Audience Engagement
  - 17.10.3. Continuous Improvement of Content through Analytics

## Module 18. Automation and Optimization of Marketing Processes with AI

- 18.1. Marketing Automation with AI using Hubspot
  - 18.1.1. Audience Segmentation Based on AI
  - 18.1.2. Workflow Automation
  - 18.1.3. Continuous Optimization of Online Campaigns
- 18.2. Integration of Data and Platforms in Automated Marketing Strategies
  - 18.2.1. Analysis and Unification of Multichannel Data
  - 18.2.2. Interconnection between Different Marketing Platforms
  - 18.2.3. Real-Time Data Updating
- 18.3. Optimization of Advertising Campaigns with AI through Google Ads
  - 18.3.1. Predictive Analysis of Advertising Performance
  - 18.3.2. Automatic Advertisement Personalization According to Target Audience
  - 18.3.3. Automatic Budget Adjustment Based on Results

- 18.4. Audience Personalization with AI
  - 18.4.1. Content Segmentation and Personalization
  - 18.4.2. Personalized Content Recommendations
  - 18.4.3. Automatic Identification of Audiences or Homogeneous Groups
- 18.5. Automation of Responses to Customers through AI
  - 18.5.1. Chatbots and Machine Learning
  - 18.5.2. Automatic Response Generation
  - 18.5.3. Automatic Problem Solving
- 18.6. AI in Email Marketing for Automation and Personalization
  - 18.6.1. Automation of Email Sequences
  - 18.6.2. Dynamic Customization of Content According to Preferences
  - 18.6.3. Intelligent Segmentation of Mailing Lists
- 18.7. Social Media Sentiment Analysis with AI and Customer Feedback through Lexalytics
  - 18.7.1. Automatic Sentiment Monitoring in Comments
  - 18.7.2. Personalized Responses to Emotions
  - 18.7.3. Predictive Reputation Analysis
- 18.8. Price and Promotions Optimization with AI through Vendavo
  - 18.8.1. Automatic Price Adjustment Based on Predictive Analysis
  - 18.8.2. Automatic Generation of Offers Adapted to User Behavior
  - 18.8.3. Real-Time Competitive and Price Analysis
- 18.9. Integration of AI into Existing Marketing Tools
  - 18.9.1. Integration of AI Capabilities with Existing Marketing Platforms
  - 18.9.2. Optimization of Existing Functionalities
  - 18.9.3. Integration with CRM Systems
- 18.10. Trends and Future of Marketing Automation with AI
  - 18.10.1. AI to Improve User Experience
  - 18.10.2. Predictive Approach to Marketing Decisions
  - 18.10.3. Conversational Advertising

## Module 19. Analysis of Communication and Marketing Data for Decision Making

- 19.1. Specific Technologies and Tools for Communication and Marketing Data Analysis using Google Analytics 4
  - 19.1.1. Tools for Analyzing Conversations and Trends in Social Media
  - 19.1.2. Systems to Identify and Evaluate Emotions in Communications
  - 19.1.3. Use of Big Data to Analyze Communications
- 19.2. AI Applications in Marketing Big Data Analytics such as Google BigQuery
  - 19.2.1. Automatic Processing of Massive Data
  - 19.2.2. Identification of Behavioral Patterns
  - 19.2.3. Optimization of Algorithms for Data Analysis
- 19.3. Data Visualization and Reporting Tools for Campaigns and Communications with AI
  - 19.3.1. Creation of Interactive Dashboards
  - 19.3.2. Automatic Report Generation
  - 19.3.3. Predictive Visualization of Campaign Results
- 19.4. Application of AI in Market Research through Quid
  - 19.4.1. Automatic Survey Data Processing
  - 19.4.2. Automatic Identification of Audience Segments
  - 19.4.3. Market Trend Prediction
- 19.5. Predictive Analytics in Marketing for Decision Making
  - 19.5.1. Predictive Models of Consumer Behavior
  - 19.5.2. Campaign Performance Forecasting
  - 19.5.3. Automatic Adjustment of Strategic Optimization
- 19.6. Market Segmentation with AI using Meta
  - 19.6.1. Automated Analysis of Demographic Data
  - 19.6.2. Identification of Interest Groups
  - 19.6.3. Dynamic Personalization of Offers
- 19.7. Marketing Strategy Optimization with AI
  - 19.7.1. Use of AI to Measure Channel Effectiveness
  - 19.7.2. Strategic Automatic Adjustment to Maximize Results
  - 19.7.3. Scenario Simulation



- 19.8. AI in Marketing ROI Measurement with GA4
  - 19.8.1. Conversion Attribution Models
  - 19.8.2. ROI Analysis using AI
  - 19.8.3. Customer Lifetime Value Estimation
- 19.9. Success Stories in Data Analytics with AI
  - 19.9.1. Demonstration by Practical Cases in which AI has Improved Results
  - 19.9.2. Cost and Resource Optimization
  - 19.9.3. Competitive Advantages and Innovation
- 19.10. Challenges and Ethical Considerations in AI Data Analysis
  - 19.10.1. Biases in Data and Results
  - 19.10.2. Ethical Considerations in Handling and Analyzing Sensitive Data
  - 19.10.3. Challenges and Solutions for Making AI Models Transparent

## Module 20. Sales and Lead Generation with Artificial Intelligence

- 20.1. Application of AI in the Sales Process through Salesforce
  - 20.1.1. Automation of Sales Tasks
  - 20.1.2. Predictive Analysis of the Sales Cycle
  - 20.1.3. Optimization of Pricing Strategies
- 20.2. Lead Generation Techniques and Tools with AI through Hubspot
  - 20.2.1. Automated Prospect Identification
  - 20.2.2. User Behavior Analysis
  - 20.2.3. Personalization of Content for Engagement
- 20.3. Lead Scoring with AI using Hubspot
  - 20.3.1. Automated Evaluation of Lead Qualification
  - 20.3.2. Lead Analysis Based on Interactions
  - 20.3.3. Lead Scoring Model Optimization
- 20.4. AI in Customer Relationship Management
  - 20.4.1. Automated Tracking to Improve Customer Relationships
  - 20.4.2. Personalized Customer Recommendations
  - 20.4.3. Automation of Personalized Communications
- 20.5. Implementation and Success Cases of Virtual Assistants in Sales
  - 20.5.1. Virtual Assistants for Sales Support
  - 20.5.2. Customer Experience Improvement
  - 20.5.3. Conversion Rate Optimization and Sales Closing



- 20.6. Customer Needs Prediction with AI
  - 20.6.1. Purchase Behavior Analysis
  - 20.6.2. Dynamic Offer Segmentation
  - 20.6.3. Personalized Recommendation Systems
- 20.7. Sales Offer Personalization with AI
  - 20.7.1. Dynamic Adaptation of Sales Proposals
  - 20.7.2. Behavior-Based Exclusive Offers
  - 20.7.3. Creation of Customized Packs
- 20.8. Competition Analysis with IA
  - 20.8.1. Automated Competitor Monitoring
  - 20.8.2. Automated Comparative Price Analysis
  - 20.8.3. Predictive Competitive Surveillance
- 20.9. Integration of AI in Sales Tools
  - 20.9.1. Compatibility with CRM Systems
  - 20.9.2. Empowerment of Sales Tools
  - 20.9.3. Predictive Analysis in Sales Platforms
- 20.10. Innovations and Predictions in the Sales Environment
  - 20.10.1. Augmented Reality in Shopping Experience
  - 20.10.2. Advanced Automation in Sales
  - 20.10.3. Emotional intelligence in Sales Interactions



*You will analyze the impact of AI on programmatic advertising and lead generation, preparing you to face the challenges and opportunities of contemporary Digital Marketing”*

07

# Clinical Internship

After passing the online theoretical period, the program includes a period of practical specialization in a reference company. In this way, graduates will have at their disposal the support of a tutor who will accompany them throughout the process, both in the preparation and in the development of the internship.





“

*You will work on the development and management of AI-driven Digital Marketing strategies, including the integration of chatbots and virtual assistants for the improvement of the customer experience”*



The Internship Program period of this program in Artificial Intelligence in Marketing and Communication is made up of a practical stay in a prestigious company, lasting 3 weeks, from Monday to Friday and with days of 8 consecutive hours of practical preparation, always next to an adjunct specialist. This internship will allow them to develop Artificial Intelligence projects to be applied in Marketing and Communication, together with a team of reference professionals, applying the most innovative techniques and planning strategies with the best results today.

In this specialization proposal, of a completely practical nature, the activities are aimed at developing and perfecting the skills necessary for the development of Artificial Intelligence projects in areas and conditions that require a high level of qualification, and are oriented towards specific qualification for the exercise of the activity. It is, without a doubt, an opportunity to learn by working.

The practical part will be carried out with the active participation of students performing the activities and procedures of each area of competence (learning to learn and learning to do), with the accompaniment and guidance of teachers and other fellow trainees that facilitate teamwork and multidisciplinary integration as transversal competencies for the praxis of the application of Artificial Intelligence in Marketing and Communication (learning to be and learning to relate).

The procedures described below will be the basis of the practical part of the specialization, and their completion will be subject to the center's own availability and its workload, the proposed activities being the following:





Module	Practical Activity
Development of Digital Marketing Strategies with AI	Implementing AI solutions to personalize user experiences in digital campaigns
	Apply Machine Learning algorithms to optimize audience segmentation
	Use predictive analytics tools to identify consumer trends
	Evaluate the impact of AI on the performance of digital ad campaigns
Chatbots and Virtual Assistants Management	Develop and configure chatbots to improve customer care
	Integrate virtual assistants into Digital Marketing platforms
	Optimize chatbots performance through conversational data analysis
	Adapt chatbots to automate sales and after-sales service processes
Programmatic Advertising Automation and Optimization	Set up programmatic advertising campaigns using AI tools
	Automatically monitor and adjust advertising bids based on real-time data
	Optimize advertising ROI through predictive modeling
	Conduct performance analysis of AI-based advertising campaigns
Data Analytics and Strategic Decision Making	Analyze large volumes of Marketing data to extract strategic insights
	Apply Big Data techniques to target and personalize advertising campaigns
	Use AI to generate automated performance and optimization reports
	Make strategic decisions based on AI-generated data analysis



## Civil Liability Insurance

This institution's main concern is to guarantee the safety of the trainees and other collaborating agents involved in the internship process at the company. Among the measures dedicated to achieve this is the response to any incident that may occur during the entire teaching-learning process.

To this end, this entity commits to purchasing a civil liability insurance policy to cover any eventuality that may arise during the course of the internship at the center.

This liability policy for interns will have broad coverage and will be taken out prior to the start of the practical training period. That way professionals will not have to worry in case of having to face an unexpected situation and will be covered until the end of the internship program at the center.



## General Conditions of the Internship Program

The general terms and conditions of the internship agreement for the program are as follows:

**1. TUTOR:** During the Hybrid Master's Degree, students will be assigned with two tutors who will accompany them throughout the process, answering any doubts and questions that may arise. On the one hand, there will be a professional tutor belonging to the internship center who will have the purpose of guiding and supporting the student at all times. On the other hand, they will also be assigned with an academic tutor whose mission will be to coordinate and help the students during the whole process, solving doubts and facilitating everything they may need. In this way, the student will be accompanied and will be able to discuss any doubts that may arise, both clinical and academic.

**2. DURATION:** The internship program will have a duration of three continuous weeks, in 8-hour days, 5 days a week. The days of attendance and the schedule will be the responsibility of the center and the professional will be informed well in advance so that they can make the appropriate arrangements.

**3. ABSENCE:** If the students does not show up on the start date of the Hybrid Master's Degree, they will lose the right to it, without the possibility of reimbursement or change of dates. Absence for more than two days from the internship, without justification or a medical reason, will result in the professional's withdrawal from the internship, therefore, automatic termination of the internship. Any problems that may arise during the course of the internship must be urgently reported to the academic tutor.

**4. CERTIFICATION:** Professionals who pass the Hybrid Master's Degree will receive a certificate accrediting their stay at the center.

**5. EMPLOYMENT RELATIONSHIP:** the Hybrid Master's Degree shall not constitute an employment relationship of any kind.

**6. PRIOR EDUCATION:** Some centers may require a certificate of prior education for the Hybrid Master's Degree. In these cases, it will be necessary to submit it to the TECH internship department so that the assignment of the chosen center can be confirmed.

**7. DOES NOT INCLUDE:** The Hybrid Master's Degree will not include any element not described in the present conditions. Therefore, it does not include accommodation, transportation to the city where the internship takes place, visas or any other items not listed.

However, students may consult with their academic tutor for any questions or recommendations in this regard. The academic tutor will provide the student with all the necessary information to facilitate the procedures in any case.



# 08

## Where Can I Do the Internship?

This Hybrid Master's Degree program includes in its itinerary a practical stay in a prestigious company, where graduates will put into practice everything they have learned about Artificial Intelligence in Marketing and Communication. In this sense, and to bring this program closer to more professionals, TECH offers students the opportunity to take it in different centers around the country. In this way, this institution strengthens its commitment to quality and affordable education for all.





“


*You will be able to analyze market data using advanced analysis tools, making informed decisions and optimizing results. What are you waiting for to enroll?”*



## tech 54 | Where Can I Do the Internship?



The student will be able to complete the practical part of this Hybrid master's degree at the following centers:



**Artificial Intelligence**

**Hanson\* | Agencia Creativa**

Country	City
Spain	Santa Cruz de Tenerife

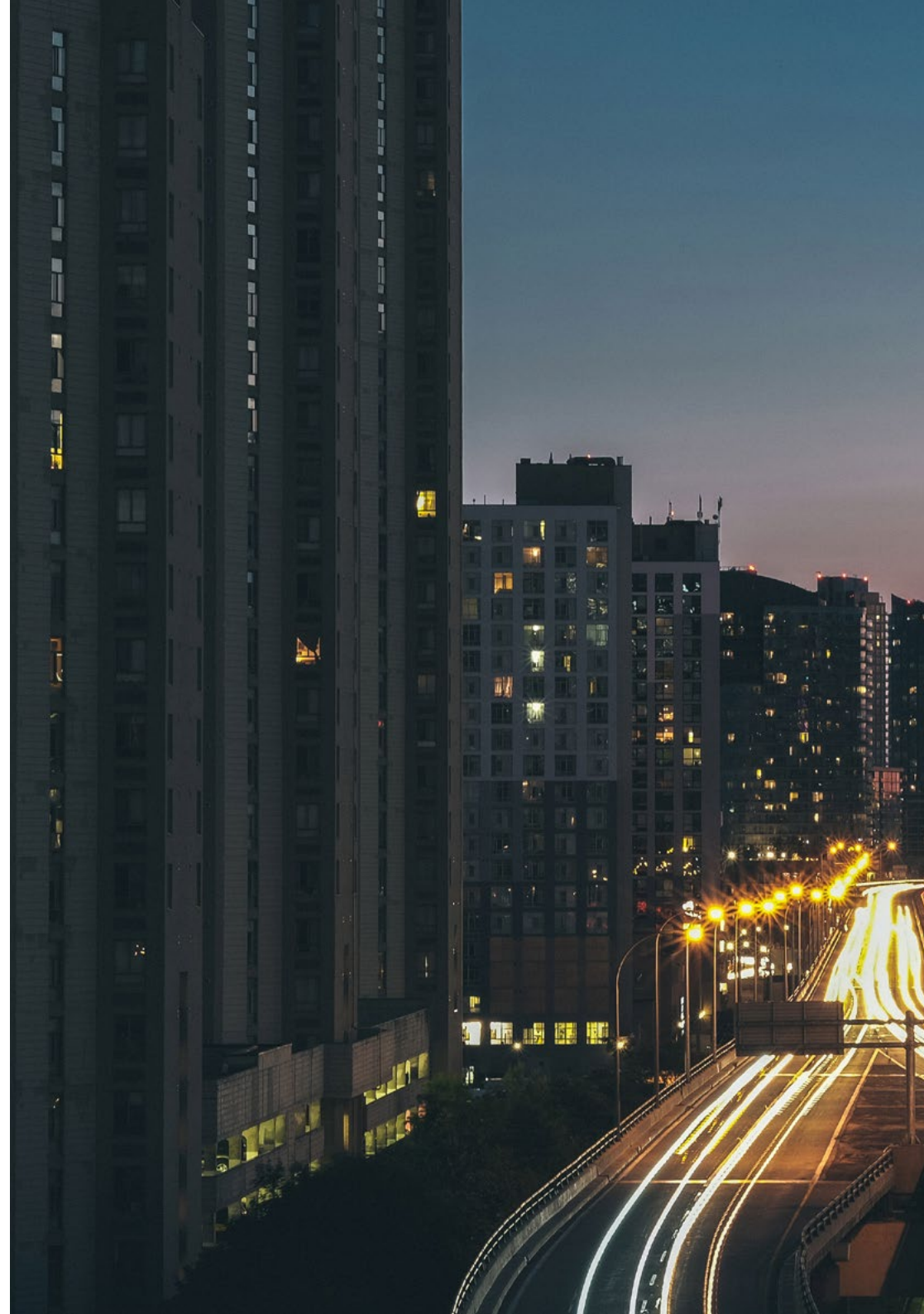
Address: Rambla de Santa Cruz, 108 cp 38004

Advertising and Marketing Agency

---

**Related internship programs:**

- Artificial Intelligence in Marketing and Communication





“

*You will combine theory and professional practice through a demanding and rewarding educational approach”*

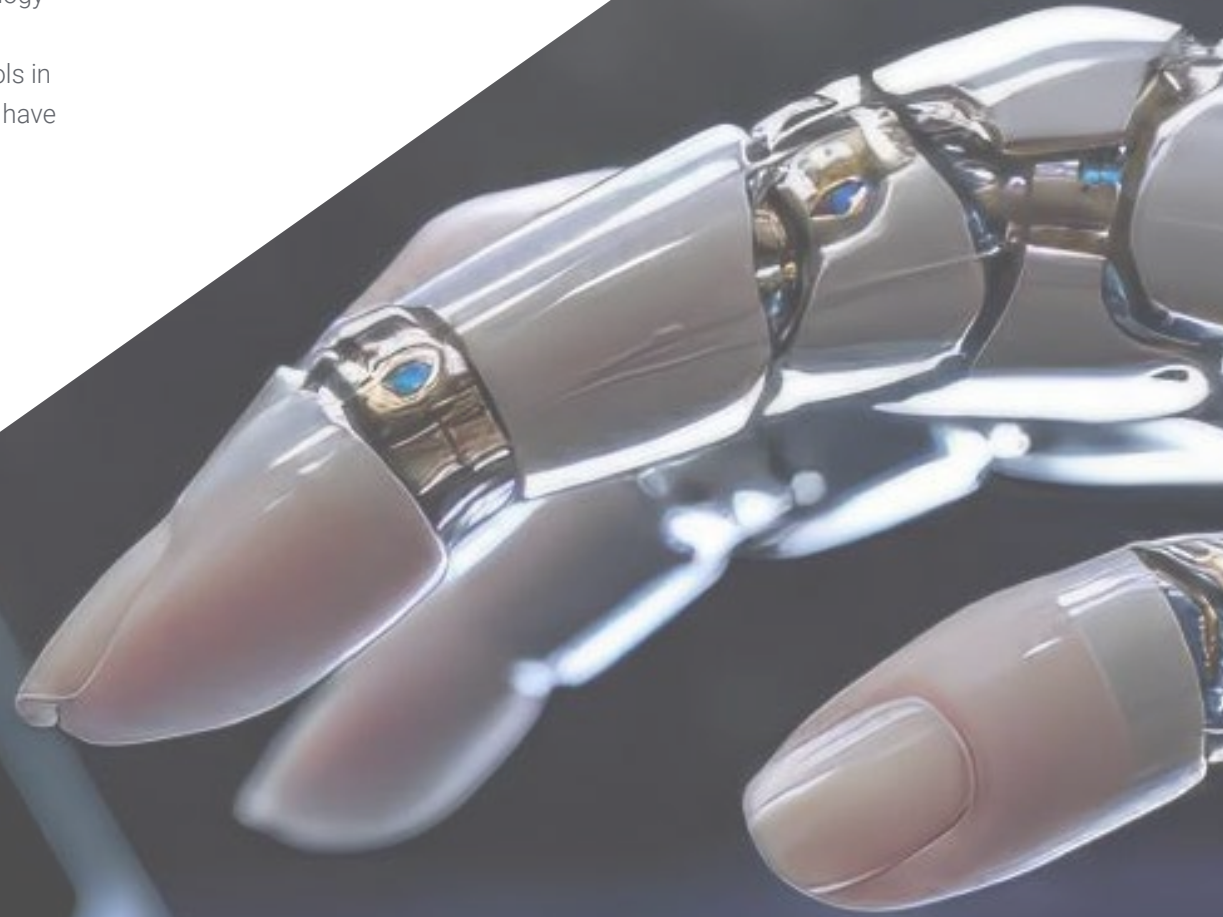


09

# Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning**.

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.





“

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

## Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

“

*At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world”*



*You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.*





## A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

“*Our program prepares you to face new challenges in uncertain environments and achieve success in your career”*

*The student will learn to solve complex situations in real business environments through collaborative activities and real cases.*

The case method has been the most widely used learning system among the world's leading Information Technology schools for as long as they have existed. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the course, students will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

## Relearning Methodology

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

We enhance the Case Study with the best 100% online teaching method: Relearning.

*In 2019, we obtained the best learning results of all online universities in the world.*

At TECH you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.





In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

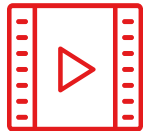
*Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success.*

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.



This program offers the best educational material, prepared with professionals in mind:



### Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.



### Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

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



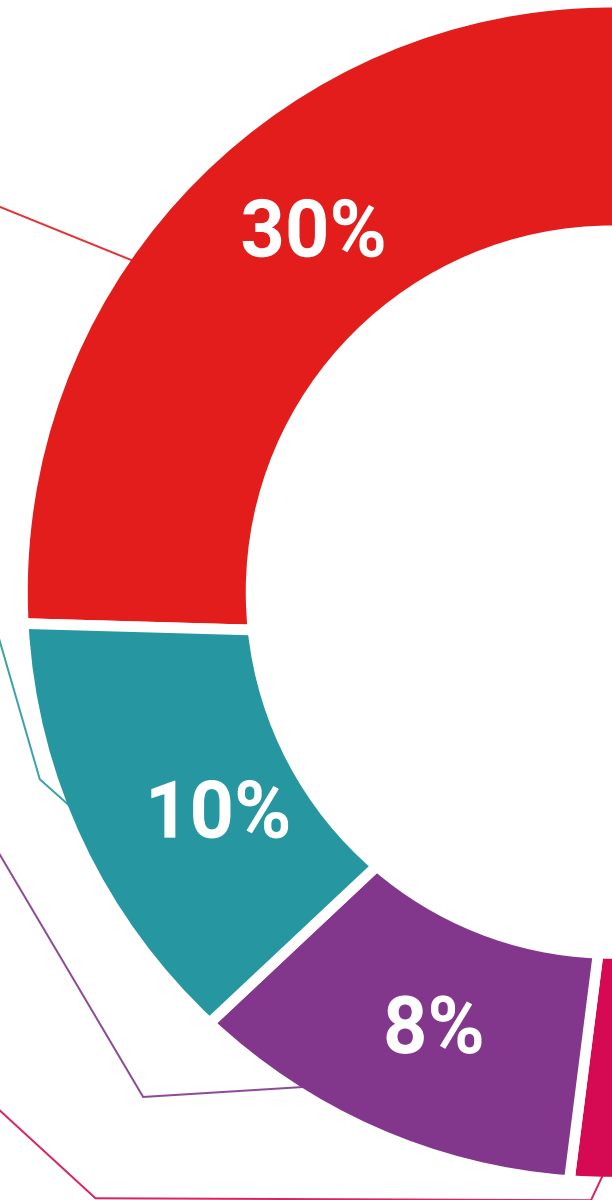
### Practising Skills and Abilities

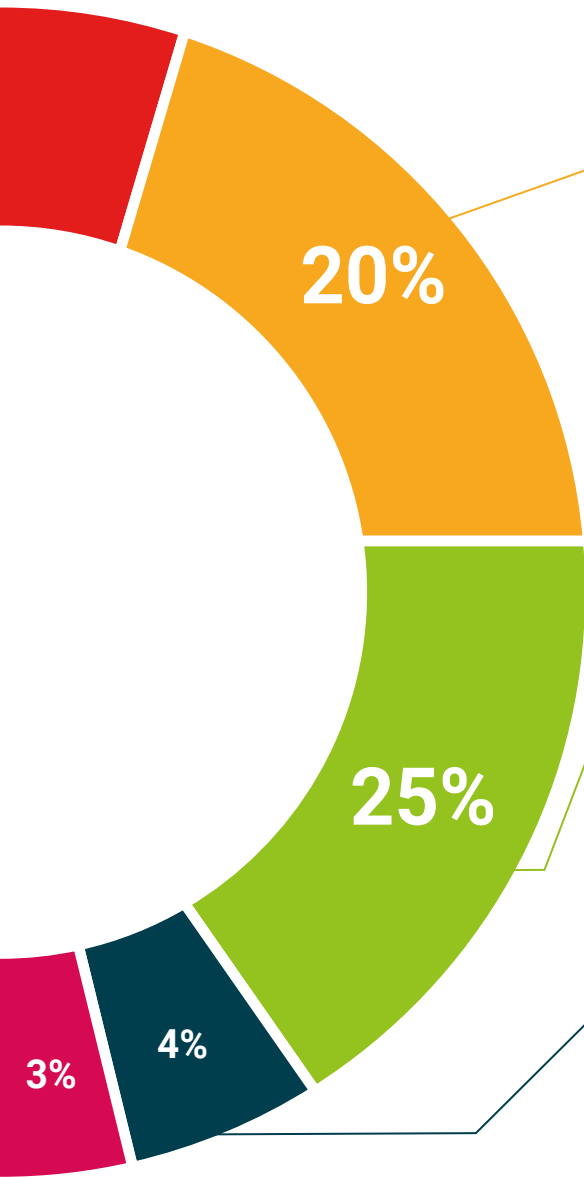
They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



### Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





### Case Studies

Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best specialists in the world.



### Interactive Summaries

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

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



### Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.





# 10 Certificate

The Hybrid Master's Degree in Artificial Intelligence in Marketing and Communication guarantees students, in addition to the most rigorous and up-to-date education, access to a Hybrid master's degree 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 **Hybrid Master's Degree in Artificial Intelligence in Marketing and Communication** 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.

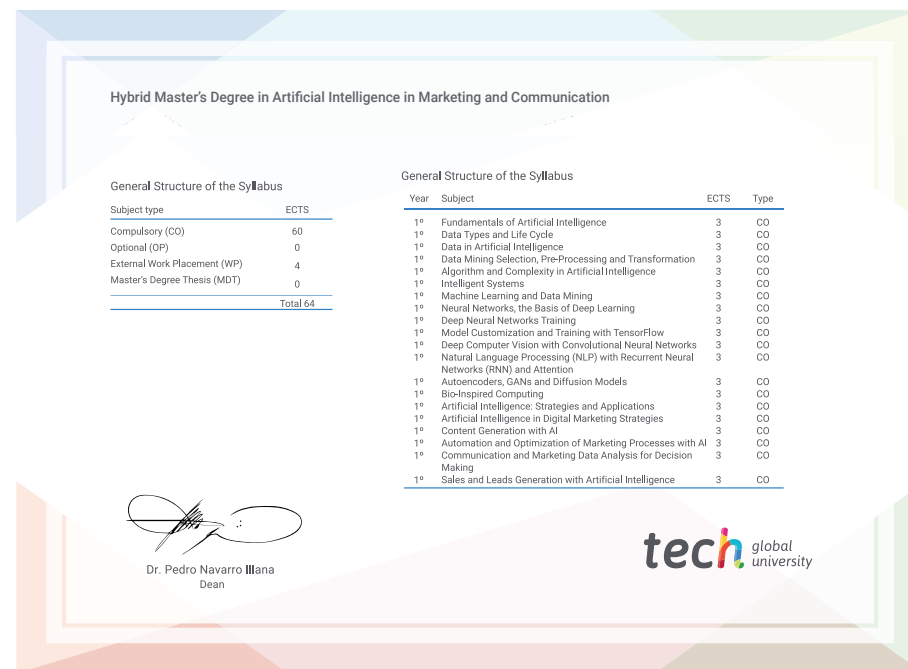
This **TECH Global University** private qualification is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Hybrid Master's Degree in Artificial Intelligence in Marketing and Communication**

Modality: **Hybrid (Online + Internship)**

Duration: **12 months**

Accreditation: **60 + 4 ECTS**



\*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.

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



## Hybrid Master's Degree Artificial Intelligence in Marketing and Communication

Modality: Hybrid (Online + Internship)

Duration: 12 months

Certificate: TECH Global University

Accreditation: 60 + 4 ECTS

# Hybrid Master's Degree

## Artificial Intelligence in Marketing and Communication