Master's Degree

Artificial Intelligence in Translation and Interpreting

tech global university

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Master's Degree
Artificial Intelligence in Translation and Interpreting

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Accreditation: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/us/artificial-intelligence/master-degree/master-artificial-intelligence-translation-interpreting**

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01

Introduction

Artificial Intelligence (AI) has revolutionized the field of Translation and Interpreting, offering advanced tools that optimize the accuracy and speed of linguistic work. With the development of language models, such as GPT-4, and neural machine translation systems, such as those implemented by Google and DeepL, AI not only facilitates real-time text translation, but also improves simultaneous interpretation in multilingual contexts. In this context, TECH has developed a fully online program that adapts to graduates' personal and professional schedules. In addition, it employs an innovative learning methodology called Relearning, which is a pioneer in this university.

With this 100% online Master's Degree, you will gain access to specialized knowledge in the most advanced technologies, such as neural machine translation and speech recognition"

In recent years, Artificial Intelligence has revolutionized the field of Translation and Interpreting, becoming an essential tool for Humanities experts. Advanced technologies, such as Neural Machine Translation (NMT), used by platforms such as Google Translate and DeepL, have reached unprecedented levels of accuracy, approaching human quality in certain contexts.

This is how this Master's Degree was created, thanks to which professionals will immerse themselves in the analysis and application of linguistic models in Artificial Intelligence, analyzing from the fundamentals to the most avant-garde developments. In addition, they will be able to handle probabilistic models based on rules and deep learning, for use in translation and interpretation, also addressing technologies such as language generation and sentiment analysis.

Furthermore, the experts will acquire knowledge about Neural Machine Translation (NMT) and Natural Language Processing (NLP), implementing and evaluating these technologies in working environments. They will also be prepared to face the ethical and social challenges of using AI in real-time translation, ensuring comprehensive training in technology and its practical and moral implications.

Finally, you will delve into advanced AI-assisted translation tools, as well as the integration of speech recognition technologies in machine interpreting. In turn, you will be able to use and evaluate specialized platforms, optimizing the user experience in translation and interpretation through AI, culminating with a focus on the design of multilingual interfaces and chatbots, to develop innovative solutions for global communication.

In this way, TECH has designed a complete online university program, making it easy for graduates to access educational materials through a device with Internet access. This eliminates the need to travel to a physical location or follow a rigid schedule. Additionally, it includes the revolutionary Relearning methodology, focused on the repetition of key concepts to improve the understanding of the content.

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

- The development of case studies presented by experts in Artificial Intelligence focused on Translation and Interpreting
- The graphic, schematic, and practical contents with which they are created, provide practical information on the disciplines that are essential for professional practice
- Practical exercises where the self-assessment process can be carried out to improve learning
- Its special emphasis on innovative methodologies
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection

You will not only be proficient in the use of new technologies, but you will also be aware of their cultural and professional impact, through the best didactic materials, at the forefront of technology and education"

You will delve into the fundamentals of linguistic models, exploring from classical approaches to more advanced ones, such as deep learning models. With all the TECH quality guarantees!"

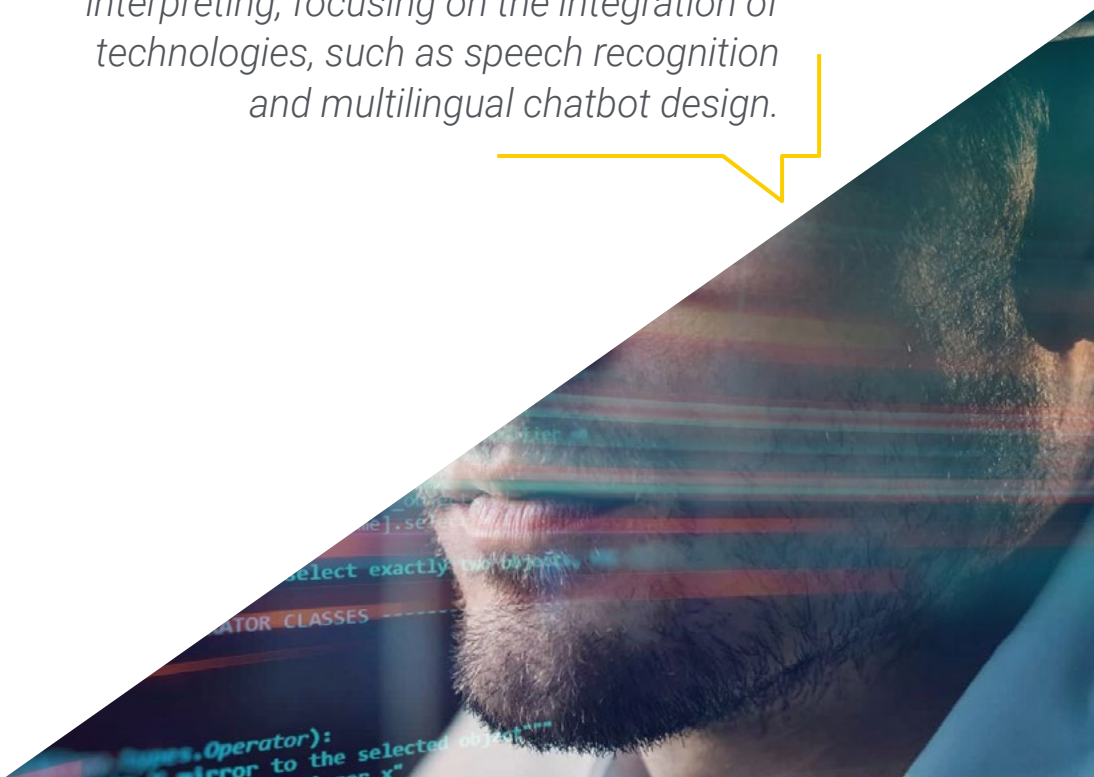
You will approach real-time translation in a comprehensive way, understanding Natural Language Processing and Neural Machine Translation, thanks to an extensive library of innovative multimedia resources.

Bet on TECH! You'll delve deeper into AI-assisted translation and machine interpreting, focusing on the integration of technologies, such as speech recognition and multilingual chatbot design.

The program's teaching staff includes professionals from the field who contribute their work experience to this educational 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 in the field of educational coaching with extensive experience.



02

Objectives

The main objective of the program will be to equip professionals with an advanced and practical understanding of how Artificial Intelligence can transform and optimize translation and interpreting. As such, they will develop key competencies in the use of emerging technologies, such as Neural Machine Translation and speech recognition, applied to multilingual and multicultural contexts. In addition, they will focus on the integration of AI tools and platforms into the professional workflow, promoting a critical reflection on the associated ethical and social challenges.

You will be trained to implement innovative and ethically responsible solutions in the field of translation and interpreting, contributing to the advancement of the field with an informed and technical perspective"

General Objectives

- Understand the theoretical foundations of Artificial Intelligence
- Study the different types of data and understand the data lifecycle
- Evaluate the crucial role of data in the development and implementation of AI solutions
- Delve into algorithms and complexity to solve specific problems
- Explore the theoretical basis of neural networks for Deep Learning development
- Explore bio-inspired computing and its relevance in the development of intelligent systems
- Understand classical and modern linguistic models and their application in Artificial Intelligence
- Acquire skills to use and optimize AI tools in real-time translation, ensuring accuracy and fluency in multilingual contexts
- Become skilled in the use of the main AI-assisted translation platforms and tools, integrating them effectively into the professional workflow
- Learn how to integrate speech recognition technologies into machine interpreting systems, improving accessibility and efficiency
- Design and program multilingual chatbots using AI, enhancing interaction with users in different languages
- Develop criteria and methods for assessing the quality of translations and interpretations performed with AI tools
- Integrate AI tools and platforms into the workflow of translators and interpreters, optimizing productivity and consistency
- Train in identifying and resolving ethical and social challenges related to the use of Artificial Intelligence in translation and interpreting
- Explore and implement innovations in the field of AI-assisted translation and interpretation, anticipating emerging trends
- Equip yourself with the necessary skills to lead projects and teams in the implementation of AI solutions in the field of translation and interpreting

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 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. Linguistic Models and AI Application

- Acquire a solid knowledge of the different linguistic models, from classical to AI-based, and their relevance in translation and interpreting
- Develop the skills to apply probabilistic, rule-based and deep learning models in Natural Language Processing (NLP) tasks

Module 17. AI and Real-Time Translation

- Learn to handle AI-based real-time translation tools, improving efficiency and accuracy in multilingual communication
- Develop skills to evaluate the quality of real-time translations, using specific metrics and indicators

Module 18. AI-Assisted Translation Tools and Platforms

- Familiarize yourself with the main AI-assisted translation tools and platforms (TAIA) and learn how to integrate them into your professional workflow
- Learn how to integrate linguistic resources and databases into TAIA tools, optimizing translation productivity and consistency

Module 19 Integration of Speech Recognition Technologies in Automatic Interpretation

- Develop skills to integrate speech recognition technologies into machine interpreting systems, improving the accessibility and quality of interpretations
- Learn how to improve the user experience in automatic interpreting systems through the optimization of speech recognition technologies

Module 20. Design of Multilanguage Interfaces and Chatbots Using AI Tools

- Acquire skills in the design and development of multilanguage chatbots using Artificial Intelligence, applying Natural Language Processing (NLP) techniques
- Learn to analyze data and optimize the performance of multilanguage chatbots, improving their interaction capacity in different contexts and platforms

You will be equipped with in-depth and specialized knowledge in the integration of AI technologies in the field of Translation and Interpreting, from the best online university in the world, according to Forbes: TECH"

03

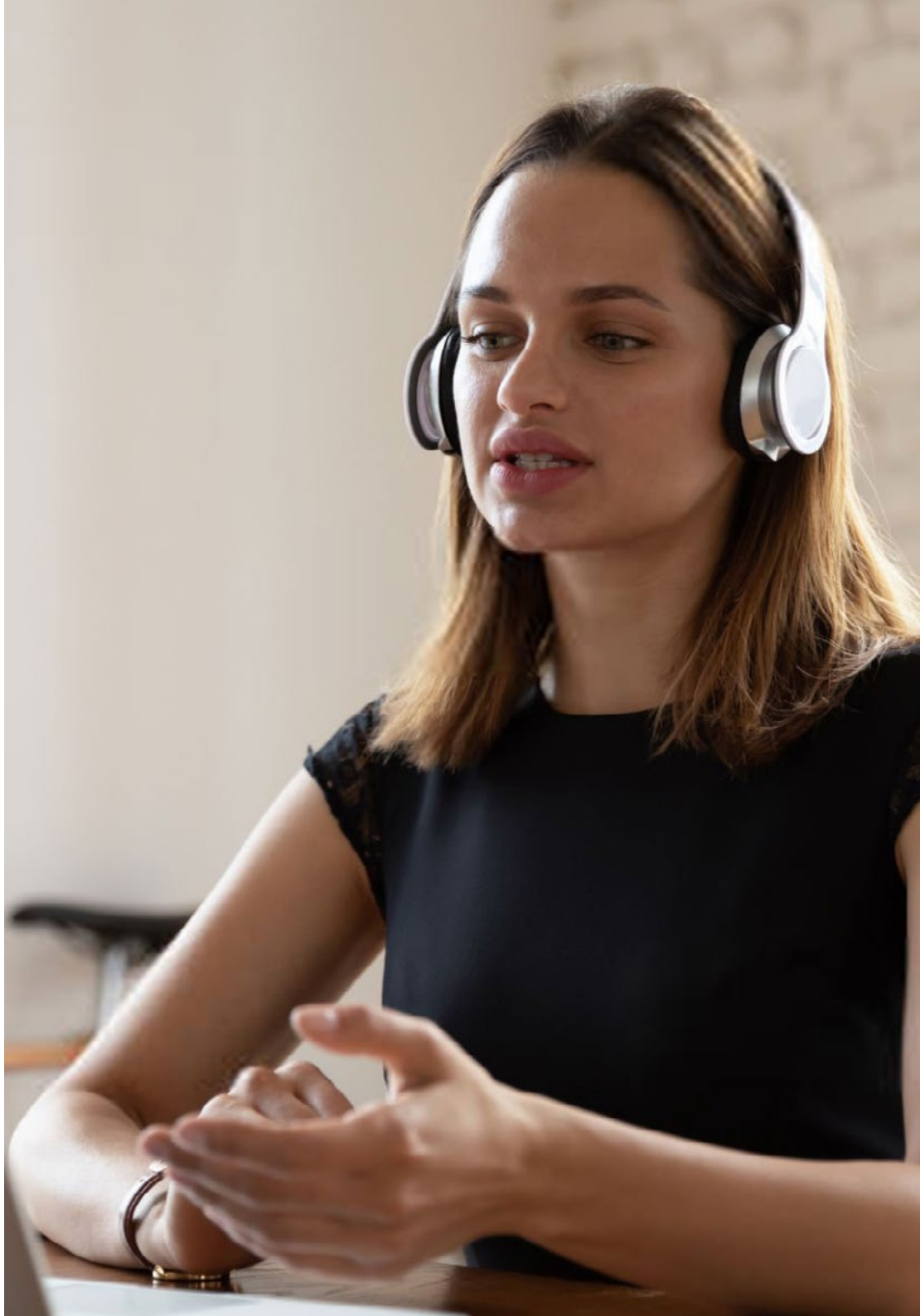
Skills

This academic program will develop a series of key competencies, focusing on the advanced mastery of emerging technologies applied to the field of Translation and Interpreting. Therefore, professionals will acquire skills in the implementation and evaluation of advanced linguistic models, such as Neural Machine Translation and speech recognition, allowing them to optimize their work processes and offer innovative solutions. In addition, a critical capacity to analyze the ethical and social impacts of Artificial Intelligence will be fostered, ensuring that not only are these technologies used effectively, but also that the associated cultural and professional implications are handled responsibly.

Don't miss this unique opportunity that only TECH offers you! You will develop skills in the design of multilingual interfaces and chatbots, optimizing the user experience on digital platforms"

General Skills

- Master data mining techniques, including complex data selection, preprocessing and transformation
- Design and develop intelligent systems capable of learning and adapting to changing environments
- Control machine learning tools and their application in data mining for decision making
- Employ Autoencoders, GANs and Diffusion Models to solve specific challenges in Artificial Intelligence
- Implement an encoder-decoder network for neural machine translation
- Apply the fundamental principles of neural networks in solving specific problems
- Understand and apply classical and modern linguistic models in Artificial Intelligence tools
- Use and optimize AI tools for real time translation, improving accuracy and fluency
- Implement AI-assisted translation platforms and tools in professional environments, optimizing workflows
- Integrate speech recognition technologies into machine interpreting systems, improving accessibility and efficiency



Specific Skills

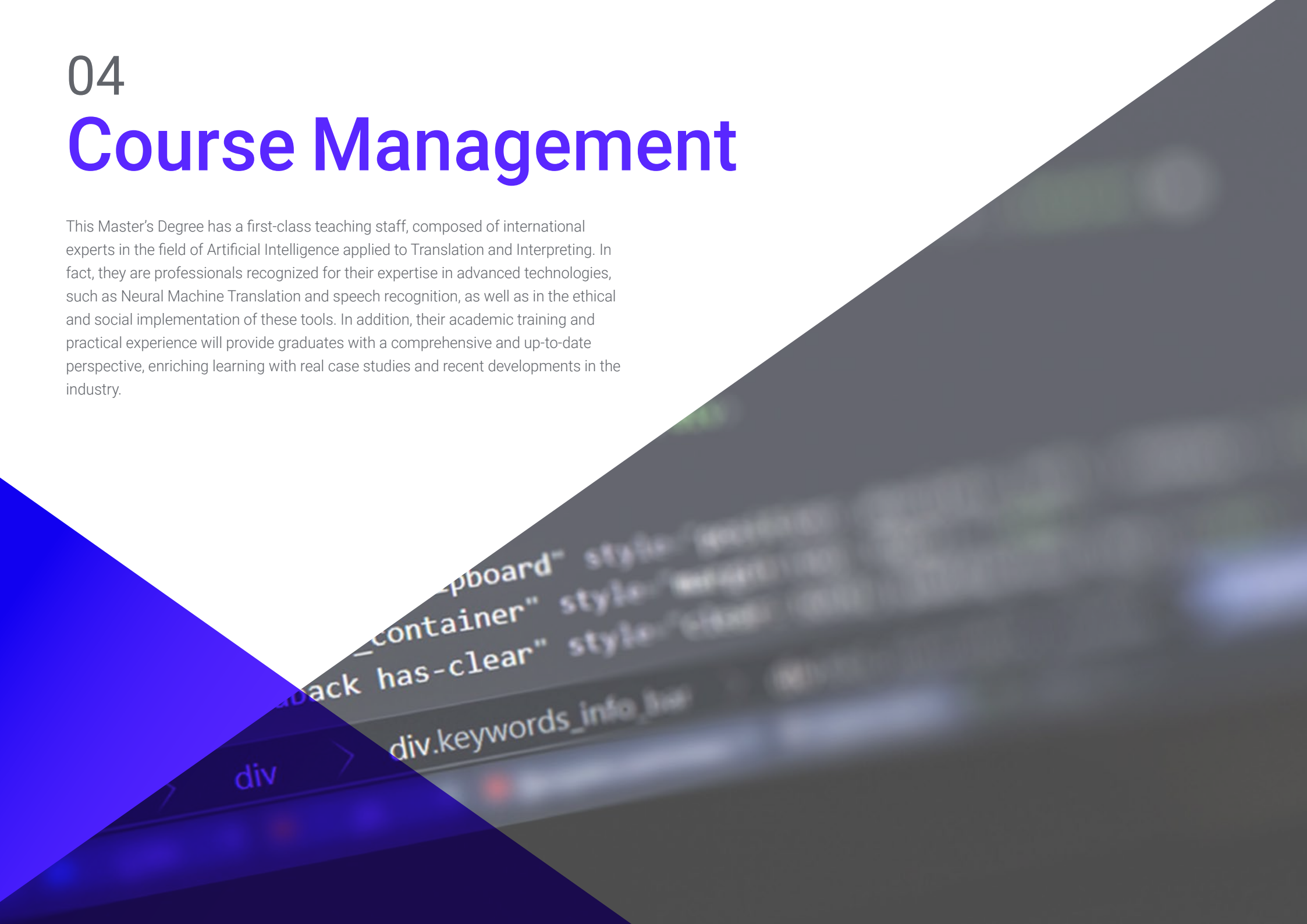
- Apply AI techniques and strategies to improve efficiency in the retail sector
- Delve into understanding and application of genetic algorithms
- Implement noise removal techniques using automatic encoders
- Effectively create training data sets for natural language processing (NLP) tasks
- Run grouping layers and their use in Deep Computer Vision models with Keras
- Use TensorFlow features and graphics to optimize the performance of custom models
- Optimize the development and application of chatbots and virtual assistants, understanding their operation and potential applications
- Master reuse of pre-workout layers to optimize and accelerate the training process
- Build the first neural network, applying the concepts learned in practice
- Activate Multilayer Perceptron (MLP) using the Keras library
- Apply data scanning and preprocessing techniques, identifying and preparing data for effective use in machine learning models
- Implement effective strategies for handling missing values in datasets, applying imputation or elimination methods according to context
- Investigate languages and software for the creation of ontologies, using specific tools for the development of semantic models
- Develop data cleaning techniques to ensure the quality and accuracy of the information used in subsequent analyses
- Apply PLN techniques in translation and interpretation, increasing multilingual language processing capacity
- Develop chatbots with multilingual capabilities through the use of AI, improving interaction with users in different languages
- Evaluate the quality of AI-assisted translations and interpretations, ensuring high professional standards
- Integrate AI tools into the workflow of translators and interpreters, improving productivity and consistency
- Address the ethical and social challenges related to the implementation of AI in translation and interpretation
- Explore emerging trends and the future of AI in the field of translation and interpreting, preparing to lead innovation

These competencies will position you as a leader at the intersection of Artificial Intelligence and the Humanities, ready to tackle industry challenges with an informed and ethical perspective"

04

Course Management

This Master's Degree has a first-class teaching staff, composed of international experts in the field of Artificial Intelligence applied to Translation and Interpreting. In fact, they are professionals recognized for their expertise in advanced technologies, such as Neural Machine Translation and speech recognition, as well as in the ethical and social implementation of these tools. In addition, their academic training and practical experience will provide graduates with a comprehensive and up-to-date perspective, enriching learning with real case studies and recent developments in the industry.



The faculty will ensure that you acquire technical skills and a deep understanding of the cultural and professional implications of the use of AI in Translation and Interpreting"

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
- 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
- Master's Degree in Executive MBA from the Isabel I University
- Master's Degree in Sales and Marketing Management, Isabel I University
- Expert Master's Degree in Big Data by Hadoop Training
- Master's Degree in Advanced Information Technologies from the University of Castilla La Mancha
- Member of: SMILE Research Group

Professors

Ms. Martínez Cerrato, Yésica

- Responsible for Technical Training at Securitas Seguridad España
- Education, Business and Marketing Specialist
- Product Manager in Electronic Security at Securitas Seguridad España
- Business Intelligence Analyst at Ricopia Technologies
- Computer Technician and Responsible for OTEC computer classrooms at the University of Alcalá de Henares
- Collaborator in the ASALUMA Association
- Degree in Electronic Communications Engineering at the Polytechnic School, University of Alcalá de Henares

Ms. Del Rey Sánchez, Cristina

- Talent Management Administrative Officer 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

05

Structure and Content

Humanities experts will be immersed in the study of advanced linguistic models, exploring everything from traditional approaches to deep learning and language generation techniques. Detailed training in the application of Artificial Intelligence for real-time translation and speech recognition will also be included, providing professionals with the necessary tools to integrate these technologies effectively in professional environments. In addition, crucial aspects such as AI-assisted translation and the design of multilingual chatbots will be addressed.

The Master's Degree in Artificial Intelligence in Translation and Interpreting will offer you a comprehensive content, covering the main technological innovations in the field of Translation and Interpreting"

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 Data Life Cycle

2.1. Statistics
  2.1.1. Statistics: Descriptive Statistics, Statistical inferential
  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. Perspect
- 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. 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. 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. 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. 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. Grap 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 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 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 Application
- 10.10.2. Building a Deep Learning
- 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 Cortex Visual 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 Preprocessing
- 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
- 14.1.1. 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 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 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 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. Linguistic Models and AI Application

16.1. Classical Models of Linguistics and their Relevance to AI
- 16.1.1. Generative and Transformational Grammar
- 16.1.2. Structural Linguistic Theory
- 16.1.3. Formal Grammar Theory
- 16.1.4. Applications of Classical Models in AI

16.2. Probabilistic Models in Linguistics and Their Application in AI
- 16.2.1. Hidden Markov Models (HMM)
- 16.2.2. Statistical Language Models
- 16.2.3. Supervised and Unsupervised Learning Algorithms
- 16.2.4. Applications in Speech Recognition and Text Processing

16.3. Rule-Based Models and Their Implementation in AI. GPT
- 16.3.1. Formal Grammars and Rule Systems
- 16.3.2. Knowledge Representation and Computational Logic
- 16.3.3. Expert Systems and Inference Engines
- 16.3.4. Applications in Dialog Systems and Virtual Assistants

16.4. Deep Learning Models in Linguistics and Their Use in AI
- 16.4.1. Convolutional Neural Networks for Text Processing
- 16.4.2. Recurrent Neural Networks and LSTM for Sequence Modeling
- 16.4.3. Attention Models and Transformers. APERTIUM
- 16.4.4. Applications in Machine Translation, Text Generation and Sentiment Analysis.

16.5. Distributed Language Representations and Their Impact on AI
- 16.5.1. Word Embeddings and Vector Space Models
- 16.5.2. Distributed Representations of Sentences and Documents
- 16.5.3. Bag-of-Words Models and Continuous Language Models
- 16.5.4. Applications in Information Retrieval, Document Clustering and Content Recommendation

16.6. Machine Translation Models and Their Evolution in AI. Lilt
- 16.6.1. Statistical and Rule-Based Translation Models
- 16.6.2. Advances in Neural Machine Translation
- 16.6.3. Hybrid Approaches and Multilingual Models
- 16.6.4. Applications in Online Translation and Content Localization Services

16.7. Sentiment Analysis Models and Their Usefulness in AI
- 16.7.1. Sentiment Classification Methods
- 16.7.2. Detection of Emotions in Text
- 16.7.3. Analysis of User Opinions and Comments
- 16.7.4. Applications in Social Networks, Analysis of Product Opinions and Customer Service

16.8. Language Generation Models and Their Application in AI. TransPerfect Globallink
- 16.8.1. Autoregressive Text Generation Models
- 16.8.2. Conditioned and Controlled Text Generation
- 16.8.3. GPT-Based Natural Language Generation Models
- 16.8.4. Applications in Automatic Typing, Text Summarization, and Intelligent Conversation

16.9. Speech Recognition Models and Their Integration in AI
- 16.9.1. Audio Feature Extraction Methods
- 16.9.2. Speech Recognition Models Based on Neural Networks
- 16.9.3. Improvements in Speech Recognition Accuracy and Robustness
- 16.9.4. Applications in Virtual Assistants, Transcription Systems and Speech-based Device Control

16.10. Challenges and Future of Linguistic Models in AI
- 16.10.1. Challenges in Natural Language Understanding
- 16.10.2. Limitations and Biases in Current Linguistic Models
- 16.10.3. Research and Future Trends in AI Linguistic Modeling
- 16.10.4. Impact on Future Applications such as General Artificial Intelligence (AGI) and Human Language Understanding. SmartCAt

Module 17. AI and Real-Time Translation

17.1. Introduction to Real-Time Translation with AI
- 17.1.1. Definition and Basic Concepts
- 17.1.2. Importance and Applications in Different Contexts
- 17.1.3. Challenges and Opportunities
- 17.1.4. Tools such as Fluently or Voice Tra

17.2. Artificial Intelligence Fundamentals in Translation
- 17.2.1. Brief Introduction to Artificial Intelligence
- 17.2.2. Specific Applications in Translation
- 17.2.3. Relevant Models and Algorithms

17.3. AI-Based Real-Time Translation Tools
- 17.3.1. Description of the Main Tools Available
- 17.3.2. Comparison of Functionalities and Features
- 17.3.3. Use Cases and Practical Examples

17.4. Neural Machine Translation (NMT) Models. SDL Language Cloud
- 17.4.1. Principles and Operation of NMT Models
- 17.4.2. Advantages over Traditional Approaches
- 17.4.3. Development and Evolution of NMT Models

17.5. Natural Language Processing (NLP) in Real-Time Translation. SayHi TRanslate
- 17.5.1. Basic NLP Concepts Relevant to Translation
- 17.5.2. Preprocessing and Post-Processing Techniques
- 17.5.3. Improving the Coherence and Cohesion of the Translated Text

17.6. Multilingual and Multimodal Translation Models
- 17.6.1. Translation Models that Support Multiple Languages
- 17.6.2. Integration of Modalities such as Text, Speech and Images
- 17.6.3. Challenges and Considerations in Multilingual and Multimodal Translation

17.7. Quality Assessment in Real-Time Translation with AI
- 17.7.1. Translation Quality Assessment Metrics
- 17.7.2. Automatic and Human Evaluation Methods. iTranslate Voice
- 17.7.3. Strategies to Improve Translation Quality

17.8. Integration of Real-Time Translation Tools in Professional Environments
- 17.8.1. Use of Translation Tools in Daily Work
- 17.8.2. Integration with Content Management and Localization Systems
- 17.8.3. Adaptation of Tools to Specific User Needs

17.9. Ethical and Social Challenges in Real-Time Translation with AI
- 17.9.1. Biases and Discrimination in Machine Translation
- 17.9.2. Privacy and Security of User Data
- 17.9.3. Impact on Linguistic and Cultural Diversity

17.10. Future of AI-Based Real-Time Translation. Applingua
- 17.10.1. Emerging Trends and Technological Advances
- 17.10.2. Future Prospects and Potential Innovative Applications
- 17.10.3. Implications for Global Communication and Language Accessibility

Module 18. AI-Assisted Translation Tools and Platforms

18.1. Introduction to AI-Assisted Translation Tools and Platforms
- 18.1.1. Definition and Basic Concepts
- 18.1.2. Brief History and Evolution
- 18.1.3. Importance and Benefits in Professional Translation

18.2. Main AI-Assisted Translation Tools
- 18.2.1. Description and Functionalities of the Leading Tools on the Market
- 18.2.2. Comparison of Features and Prices
- 18.2.3. Use Cases and Practical Examples

18.3. Professional AI-Assisted Translation Platforms. Wordfast
- 18.3.1. Description of Popular AI-Assisted Translation Platforms
- 18.3.2. Specific Functionalities for Translation Teams and Agencies
- 18.3.3. Integration with Other Project Management Systems and Tools

18.4. Machine Translation Models Implemented in AI-Assisted Translation Tools
- 18.4.1. Statistical Translation Models
- 18.4.2. Neural Translation Models
- 18.4.3. Advances in Neural Machine Translation (NMT) and Its Impact on AI-Assisted Translation Tools

18.5. Integration of Linguistic Resources and Databases in AI-Assisted Translation Tools
- 18.5.1. Using Corpus and Linguistic Databases to Improve Translation Accuracy
- 18.5.2. Integrating Specialized Dictionaries and Glossaries
- 18.5.3. Importance of Context and Specific Terminology in AI-Assisted Translation

18.6. User Interface and User Experience in AI-Assisted Translation Tools
- 18.6.1. User Interface Design and Usability
- 18.6.2. Customization and Preference Settings
- 18.6.3. Accessibility and Multilingual Support on AI-Assisted Translation Platforms

18.7. Quality Assessment in AI-Assisted Translation
- 18.7.1. Translation Quality Assessment Metrics
- 18.7.2. Machine vs. Human Evaluation
- 18.7.3. Strategies to Improve the Quality of AI-Assisted Translation

18.8. Integration of AI-Assisted Translation Tools into the Translator's Workflow
- 18.8.1. Incorporation of AI-Assisted Translation Tools into the Translation Process
- 18.8.2. Optimizing Workflow and Increasing Productivity
- 18.8.3. Collaboration and Teamwork in AI-Assisted Translation Environments

18.9. Ethical and Social Challenges in the Use of AI-Assisted Translation Tools
- 18.9.1. Biases and Discrimination in Machine Translation
- 18.9.2. Privacy and Security of User Data
- 18.9.3. Impact on the Translation Profession and on Linguistic and Cultural Diversity

18.10. Future of AI-Assisted Translation Tools and Platforms.Wordbee
- 18.10.1. Emerging Trends and Technological Developments
- 18.10.2. Future Prospects and Potential Innovative Applications
- 18.10.3. Implications for Training and Professional Development in the Field of Translation

Module 19. Integration of Speech Recognition Technologies in Machine Interpreting

19.1. Introduction to the Integration of Speech Recognition Technologies in Machine Interpreting
- 19.1.1. Definition and Basic Concepts
- 19.1.2. Brief History and Evolution. Kaldi
- 19.1.3. Importance and Benefits in the Field of Interpretation

19.2. Principles of Speech Recognition for Machine Interpreting
- 19.2.1. How Speech Recognition Works
- 19.2.2. Technologies and Algorithms Used
- 19.2.3. Types of Speech Recognition Systems

19.3. Development and Improvements in Speech Recognition Technologies
- 19.3.1. Recent Technological Advances. Speech Recognition
- 19.3.2. Improvements in Accuracy and Speed
- 19.3.3. Adaptation to Different Accents and Dialects

19.4. Speech Recognition Platforms and Tools for Machine Interpreting
- 19.4.1. Description of the Main Platforms and Tools Available
- 19.4.2. Comparison of Functionalities and Features
- 19.4.3. Use Cases and Practical Examples. Speechmatics

19.5. Integrating Speech Recognition Technologies into Machine Interpreting Systems
- 19.5.1. Design and Implementation of Machine Interpreting Systems with Speech Recognition
- 19.5.2. Adaptation to Different Interpreting Environments and Situations
- 19.5.3. Technical and Infrastructure Considerations

19.6. Optimization of the User Experience in Machine Interpreting with Speech Recognition
- 19.6.1. Design of Intuitive and Easy to Use User Interfaces
- 19.6.2. Customization and Configuration of Preferences. OTTER.ai
- 19.6.3. Accessibility and Multilingual Support in Machine Interpreting Systems

19.7. Assessment of the Quality in Machine Interpreting with Speech Recognition
- 19.7.1. Interpretation Quality Assessment Metrics
- 19.7.2. Machine vs. Human Evaluation
- 19.7.3. Strategies to Improve the Quality in Machine Interpreting with Speech Recognition

19.8. Ethical and Social Challenges in the Use of Speech Recognition Technologies in Machine Interpreting
- 19.8.1. Privacy and Security of User Data
- 19.8.2. Biases and Discrimination in Speech Recognition
- 19.8.3. Impact on the Interpreting Profession and on Linguistic and Cultural Diversity

19.9. Specific Applications of Machine Interpreting with Speech Recognition
- 19.9.1. Real-Time Interpreting in Business and Commercial Environments
- 19.9.2. Remote and Telephonic Interpreting with Speech Recognition
- 19.9.3. Interpreting at International Events and Conferences

19.10. Future of the Integration of Speech Recognition Technologies in Machine Interpreting
- 19.10.1. Emerging Trends and Technological Developments. CMU Sphinx
- 19.10.2. Future Prospects and Potential Innovative Applications
- 19.10.3. Implications for Global Communication and Elimination of Language Barriers

Module 20. Design of Multilanguage Interfaces and Chatbots Using AI Tools

20.1. Fundamentals of Multilanguage Interfaces
- 20.1.1. Design Principles for Multilingualism: Usability and Accessibility with AI
- 20.1.2. Key Technologies: Using TensorFlow and PyTorch for Interface Development
- 20.1.3. Case Studies: Analysis of Successful Interfaces Using AI

20.2. Introduction to Chatbots with AI
- 20.2.1. Evolution of Chatbots: from Simple to AI-Driven
- 20.2.2. Comparison of Chatbots: Rules vs. AI-Based Models
- 20.2.3. Components of AI-Driven Chatbots: Use of Natural Language Understanding (NLU)

20.3. Multilanguage Chatbot Architectures with AI
- 20.3.1. Design of Scalable Architectures with IBM Watson
- 20.3.2. Designing Scalable Architectures with IBM Watson
- 20.3.3. Integration of Chatbots in Platforms with Microsoft Bot Framework

20.4. Natural Language Processing (NLP) for Chatbots
- 20.4.1. Syntactic and Semantic Parsing with Google BERT
- 20.4.2. Language Model Training with OpenAI GPT
- 20.4.3. Application of PLN Tools such as spaCy in Chatbots

20.5. Development of Chatbots with AI Frameworks
- 20.5.1. Implementation with Google Dialogflow
- 20.5.2. Creating and Training Dialog Flows with IBM Watson
- 20.5.3. Advanced Customization Using AI APIs such as Microsoft LUIS

20.6. Conversation and Context Management in Chatbots
- 20.6.1. State Models with Rasa for Chatbots
- 20.6.2. Conversational Management Strategies with Deep Learning
- 20.6.3. Real-Time Ambiguity Resolution and Corrections Using AI

20.7. UX/UI Design for Multilanguage Chatbots with AI
- 20.7.1. User-Centered Design Using AI Data Analytics
- 20.7.2. Cultural Adaptation with Automatic Localization Tools
- 20.7.3. Usability Testing with AI-Based Simulations

20.8. Integration of Multi-Channel Chatbots with AI
- 20.8.1. Omni-Channel Development with TensorFlow
- 20.8.2. Secure and Private Integration Strategies with AI Technologies
- 20.8.3. Security Considerations with AI Cryptography Algorithms

20.9. Data Analysis and Chatbot Optimization
- 20.9.1. Use of Analytics Platforms such as Google Analytics for Chatbots
- 20.9.2. Performance Optimization with Machine Learning Algorithms
- 20.9.3. Machine Learning for Continuous Chatbot Refinement

20.10. Implementing a Multilanguage Chatbot with AI
- 20.10.1. Project Definition with AI Management Tools
- 20.10.2. Technical Implementation Using TensorFlow or PyTorch
- 20.10.3. Evaluation and Tuning Based on Machine Learning and User Feedback

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.

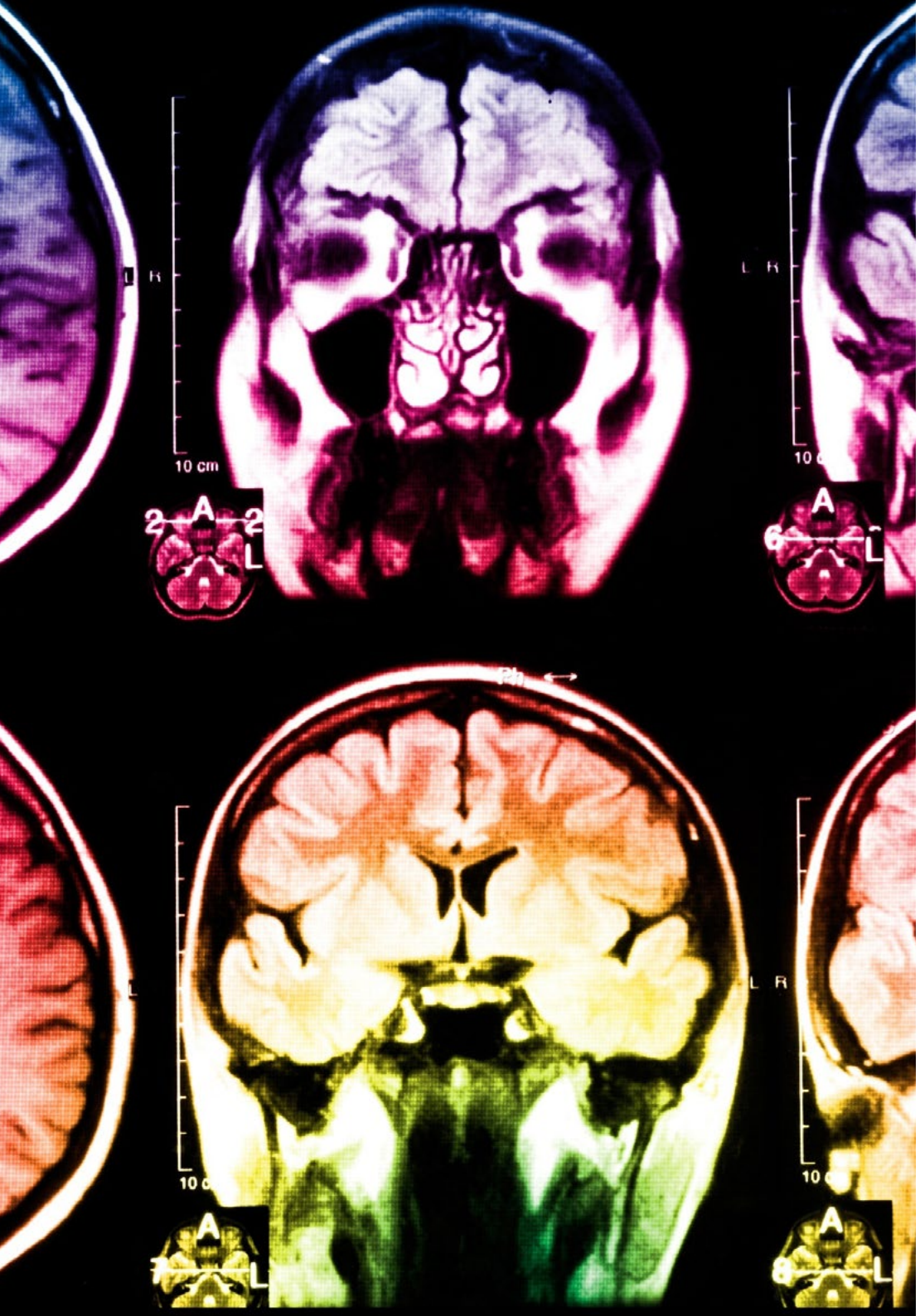
In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

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

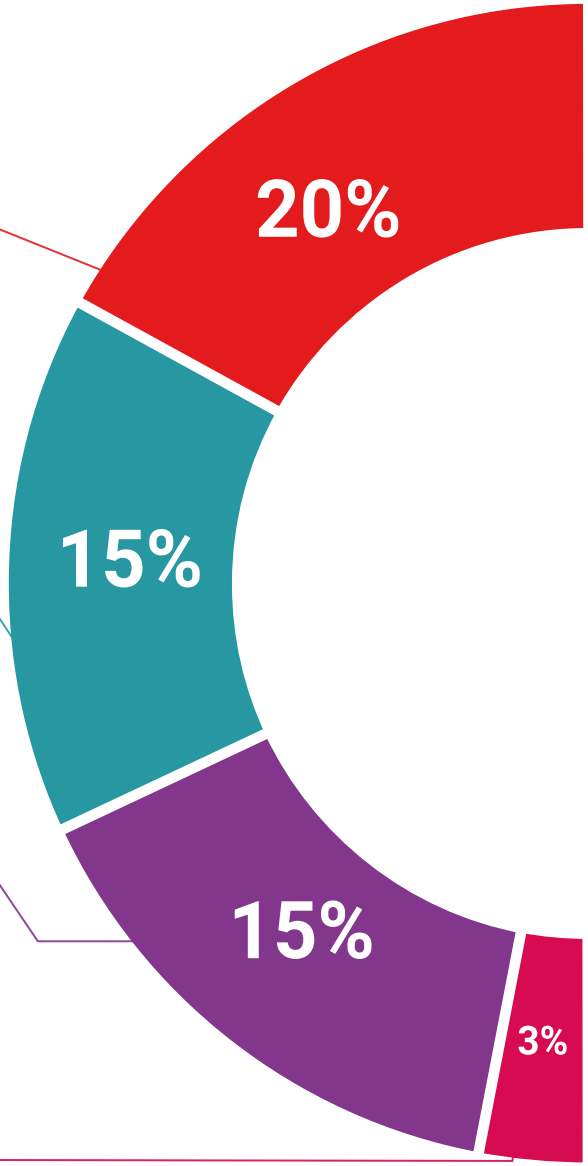
You will carry out activities to develop specific competencies and skills in each thematic field. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop within the framework of the globalization we live in.

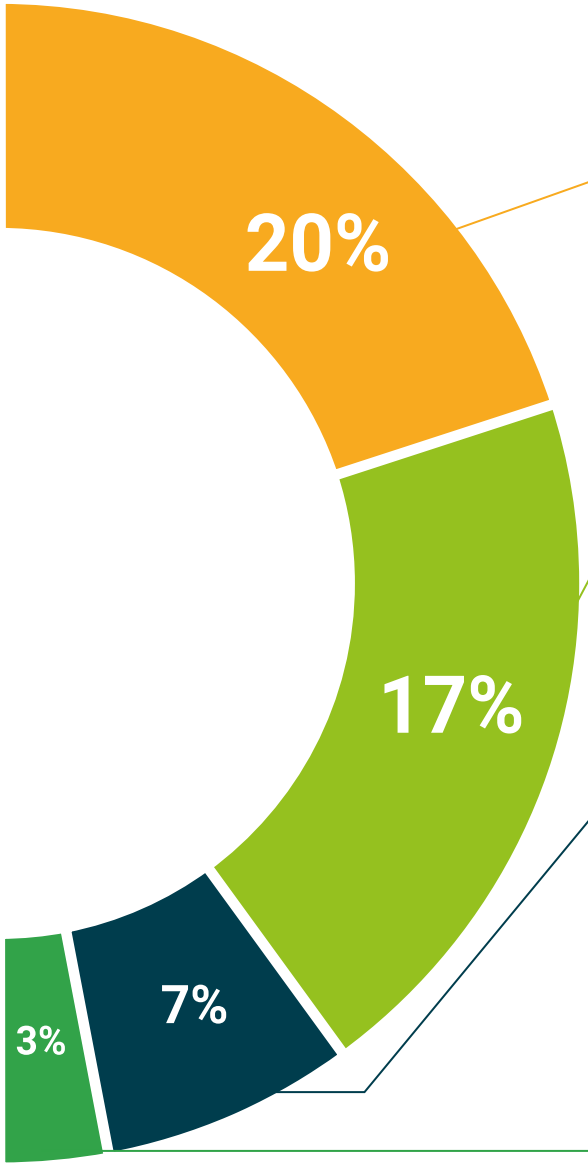
Interactive Summaries

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

Certificate

The Master's Degree in Artificial Intelligence in Translation and Interpreting guarantees students, in addition to the most rigorous and up-to-date education, access to a 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 **Master's Degree diploma in Artificial Intelligence in Translation and Interpreting** 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.

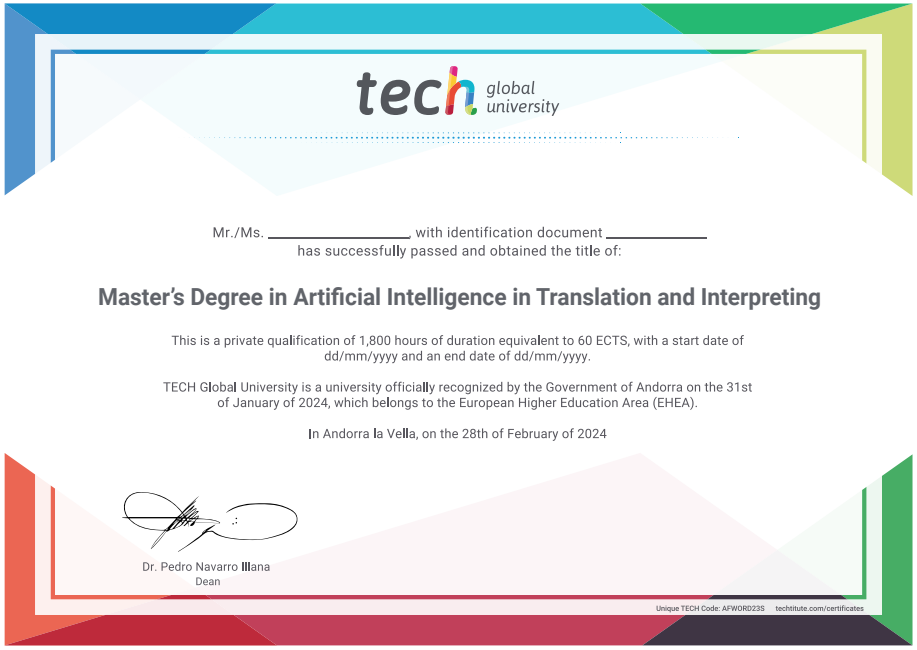
This **TECH Global University private qualification**, is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Master's Degree in Artificial Intelligence in Translation and Interpreting**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**


tech global university

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

Master's Degree in Artificial Intelligence in Translation and Interpreting

This is a private qualification of 1,800 hours of duration equivalent to 60 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


Master's Degree in Artificial Intelligence in Translation and Interpreting

General Structure of the Syllabus

Subject type	ECTS
Compulsory (CO)	60
Optional (OP)	0
External Work Placement (WP)	0
Master's Degree Thesis (MDT)	0
	Total 60

General Structure of the Syllabus

Year	Subject	ECTS	Type
1°	Fundamentals of Artificial Intelligence	3	CO
1°	Data Types and Data Life Cycle	3	CO
1°	Data in Artificial Intelligence	3	CO
1°	Data Mining: Selection, Pre-Processing and Transformation	3	CO
1°	Algorithm and Complexity in Artificial Intelligence	3	CO
1°	Intelligent Systems	3	CO
1°	Machine Learning and Data Mining	3	CO
1°	Neural Networks, the Basis of Deep Learning	3	CO
1°	Deep Neural Networks Training	3	CO
1°	Model Customization and Training with TensorFlow	3	CO
1°	Deep Computer Vision with Convolutional Neural Networks	3	CO
1°	Natural Language Processing (NLP) with Recurrent Neural Networks (RNN) and Attention	3	CO
1°	Autoencoders, GANs and Diffusion Models	3	CO
1°	Bio-Inspired Computing	3	CO
1°	Artificial Intelligence: Strategies and Applications	3	CO
1°	Linguistic Models and AI Application	3	CO
1°	AI and Real-Time Translation	3	CO
1°	AI-Assisted Translation Tools and Platforms	3	CO
1°	Integration of Speech Recognition Technologies in Automatic Interpretation	3	CO
1°	Design of Multilanguage Interfaces and Chatbots Using AI Tools	3	CO

Dr. Pedro Navarro Illana
Dean

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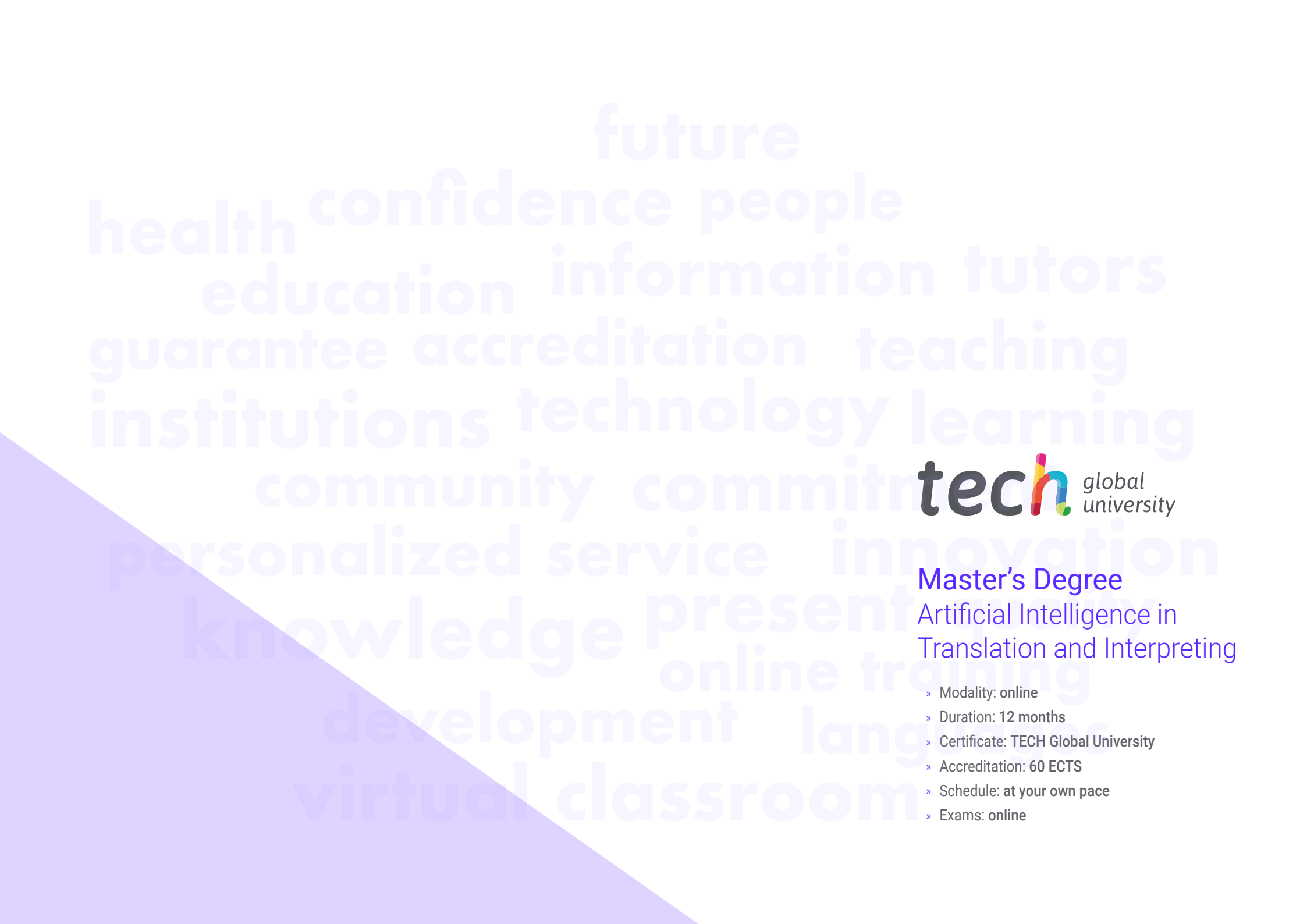
*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.



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Master's Degree
Artificial Intelligence in Translation and Interpreting

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Accreditation: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Master's Degree

Artificial Intelligence in Translation and Interpreting

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