Executive Master's Degree

Artificial Intelligence in Human Resources

MAIHR

tech global university

tech global university

Executive Master's Degree
Artificial Intelligence in Human Resources

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Accreditation: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**
- Target Group: **University graduates who have previously completed any degree in the fields of Social and Legal Sciences, Administrative and Business Sciences, or Design and Artificial Intelligence**

Website: **www.techtitute.com/us/school-of-business/executive-master-degree/master-artificial-intelligence-human-resources**

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01

Welcome

Artificial Intelligence (AI) is profoundly transforming the Human Resources (HR) Department, optimizing processes and improving operational efficiency. AI-based tools, such as talent management systems and predictive analytics platforms, allow companies to automate recruitment and selection tasks by evaluating resumes and predicting the suitability of candidates for certain roles. In this scenario, TECH presents a cutting-edge university program aimed at providing graduates with the essential tools to successfully lead the digital transformation. It should also be noted that the course is conducted entirely online, allowing students to manage their schedules independently.

Executive Master's Degree in Artificial Intelligence in Human Resources
TECH Global University

With this 100% online Executive Master's Degree, you will acquire advanced knowledge on how to implement AI solutions to automate and optimize processes, from recruitment to performance management"

02

Why Study at TECH?

TECH is the world's largest 100% online business school. It is an elite business school, with a model based on the highest academic standards. A world-class center for intensive managerial skills education.

TECH is a university at the forefront of technology, and puts all its resources at the student's disposal to help them achieve entrepreneurial success"

At TECH Global University

Innovation

The university offers an online learning model that balances the latest educational technology with the most rigorous teaching methods. A unique method with the highest international recognition that will provide students with the keys to develop in a rapidly-evolving world, where innovation must be every entrepreneur's focus.

"Microsoft Europe Success Story", for integrating the innovative, interactive multi-video system.

The Highest Standards

Admissions criteria at TECH are not economic. Students don't need to make a large investment to study at this university. However, in order to obtain a qualification from TECH, the student's intelligence and ability will be tested to their limits. The institution's academic standards are exceptionally high...

95% | **of TECH students successfully complete their studies**

Networking

Professionals from countries all over the world attend TECH, allowing students to establish a large network of contacts that may prove useful to them in the future.

+100000
executives prepared each year

+200
different nationalities

Empowerment

Students will grow hand in hand with the best companies and highly regarded and influential professionals. TECH has developed strategic partnerships and a valuable network of contacts with major economic players in 7 continents.

+500 | **collaborative agreements with leading companies**

Talent

This program is a unique initiative to allow students to showcase their talent in the business world. An opportunity that will allow them to voice their concerns and share their business vision.

After completing this program, TECH helps students show the world their talent.

Multicultural Context

While studying at TECH, students will enjoy a unique experience. Study in a multicultural context. In a program with a global vision, through which students can learn about the operating methods in different parts of the world, and gather the latest information that best adapts to their business idea.

TECH students represent more than 200 different nationalities.

Learn with the best

In the classroom, TECH's teaching staff discuss how they have achieved success in their companies, working in a real, lively, and dynamic context. Teachers who are fully committed to offering a quality specialization that will allow students to advance in their career and stand out in the business world.

Teachers representing 20 different nationalities.

At TECH, you will have access to the most rigorous and up-to-date case analyses in academia"

TECH strives for excellence and, to this end, boasts a series of characteristics that make this university unique:

Analysis

TECH explores the student's critical side, their ability to question things, their problem-solving skills, as well as their interpersonal skills.

Academic Excellence

TECH offers students the best online learning methodology. The university combines the Relearning method (postgraduate learning methodology with the best international valuation) with the Case Study. Tradition and vanguard in a difficult balance, and in the context of the most demanding educational itinerary.

Economy of Scale

TECH is the world's largest online university. It currently boasts a portfolio of more than 10,000 university postgraduate programs. And in today's new economy, **volume + technology = a ground-breaking price**. This way, TECH ensures that studying is not as expensive for students as it would be at another university.

03

Why Our Program?

Studying this TECH program means increasing the chances of achieving professional success in senior business management.

It is a challenge that demands effort and dedication, but it opens the door to a promising future. Students will learn from the best teaching staff and with the most flexible and innovative educational methodology.

We have highly qualified teachers and the most complete syllabus on the market, which allows us to offer you education of the highest academic level"

This program will provide you with a multitude of professional and personal advantages, among which we highlight the following:

01

A Strong Boost to Your Career

By studying at TECH, students will be able to take control of their future and develop their full potential. By completing this program, students will acquire the skills required to make a positive change in their career in a short period of time.

70% of students achieve positive career development in less than 2 years.

02

Develop a strategic and global vision of the company

TECH offers an in-depth overview of general management to understand how each decision affects each of the company's different functional fields.

Our global vision of companies will improve your strategic vision.

03

Consolidate the student's senior management skills

Studying at TECH means opening the doors to a wide range of professional opportunities for students to position themselves as senior executives, with a broad vision of the international environment.

You will work on more than 100 real senior management cases.

04

You will take on new responsibilities

The program will cover the latest trends, advances and strategies, so that students can carry out their professional work in a changing environment.

45% of graduates are promoted internally.

05

Access to a powerful network of contacts

TECH connects its students to maximize opportunities. Students with the same concerns and desire to grow. Therefore, partnerships, customers or suppliers can be shared.

You will find a network of contacts that will be instrumental for professional development.

06

Thoroughly develop business projects.

Students will acquire a deep strategic vision that will help them develop their own project, taking into account the different fields in companies.

20% of our students develop their own business idea.

07

Improve *soft skills* and management skills

TECH helps students apply and develop the knowledge they have acquired, while improving their interpersonal skills in order to become leaders who make a difference.

Improve your communication and leadership skills and enhance your career.

08

You will be part of an exclusive community

Students will be part of a community of elite executives, large companies, renowned institutions, and qualified teachers from the most prestigious universities in the world: the TECH Technological University community.

We give you the opportunity to study with a team of world-renowned teachers.

04

Objectives

The main objective of the university program will be to train business leaders to transform talent management and optimize HR operations through advanced technologies. Therefore, professionals will be equipped with tools and specialized knowledge in the use of Artificial Intelligence to automate selection processes, improve personnel and payroll administration, and develop effective strategies for talent retention. In addition, experts will be empowered to implement predictive analytics in performance evaluation and work climate management, ensuring more accurate decision making and greater operational efficiency.

You will leverage the potential of AI to drive innovation, achieving a significant competitive advantage in the market, through the best teaching materials, at the technological and educational forefront"

TECH makes the goals of their students their own goals too
Working together to achieve them

The **Executive Master's Degree in Artificial Intelligence in Human Resources** will enable students to:

01 Analyze the historical evolution of Artificial Intelligence (AI) and its key developments

02 Understand the operation and applications of neural networks and genetic algorithms

03 Explore principles and applications of thesauri, vocabularies and taxonomies in AI

04 Study fundamental concepts of statistics and their application in data analysis

05 Identify data types and analyze the data lifecycle

06 Explore the concept and design of Datawarehouses

07 Master data science, transformation, and visualization techniques and tools

08 Apply data mining techniques, including preprocessing, cleansing, and integration

09 Analyze and apply algorithms for solving complex problems in AI

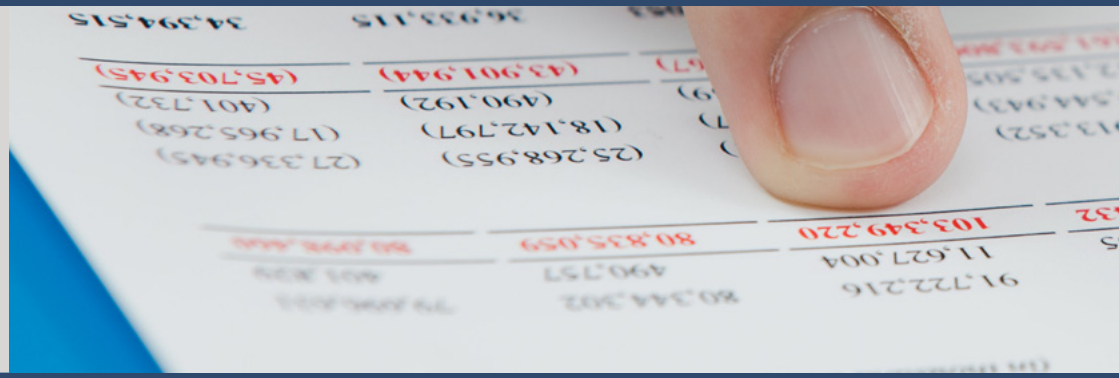
10 Explore agent theory and knowledge representation in intelligent systems

11 Introduce and apply machine learning methods, including neural networks and Bayesian modeling

12 Study and apply advanced deep learning techniques, including deep neural networks and transfer learning

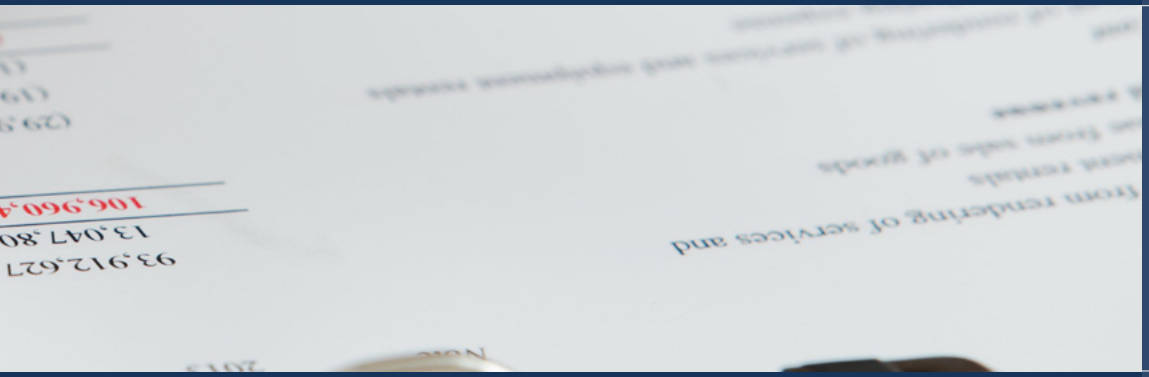
13 Use TensorFlow to customize and train Deep Learning models

14 Apply Convolutional Neural Networks (CNN) to computer vision



15 Develop Natural Language Processing (NLP) skills with Recurrent Neural Networks (RNN) and Transformers

16 Implement Autoencoders, GANs and Diffusion Models for Data Generation



17 Introduce and apply concepts of bio-inspired computation and neural networks in optimization

18 Develop AI strategies for applications in various sectors, such as finance, health, and public administration

19 Implement AI solutions for personnel management, payroll and recruitment processes

20 Use AI to personalize career development, evaluate performance, and improve the work environment

05

Skills

This academic program has been designed to develop key competencies that enable employers to lead the digital transformation in the field of Human Resources. Therefore, they will acquire advanced skills in the implementation of Artificial Intelligence solutions to automate selection processes, optimize payroll and personnel management, and improve performance evaluations through data analysis. In addition, they will be trained to apply AI techniques in talent management and professional development, using predictive analytics tools to identify and retain key talent.

Bet on TECH! You will be able to manage the work climate and foster a data-driven organizational culture, thus ensuring greater efficiency, equity and strategic decision making in your Human Resources Department"

01 Apply AI techniques and strategies to improve efficiency in the retail sector

02 Delve into understanding and application of genetic algorithms

03 Implement noise removal techniques using automatic encoders

04 Effectively create training data sets for natural language processing (NLP) tasks

05 Run grouping layers and their use in Deep Computer Vision models with Keras

06 Use TensorFlow features and graphics to optimize the performance of custom models

07 Optimize the development and application of chatbots and virtual assistants, understanding their operation and potential applications

08 Master reuse of pre-workout layers to optimize and accelerate the training process

09 Build the first neural network, applying the concepts learned in practice

10 Activate Multilayer Perceptron (MLP) using the Keras library

11 Apply data scanning and preprocessing techniques, identifying and preparing data for effective use in machine learning models

12 Implement effective strategies for handling missing values in datasets, applying imputation or elimination methods according to context

13 Investigate languages and software for the creation of ontologies, using specific tools for the development of semantic models

14 Develop data cleaning techniques to ensure the quality and accuracy of the information used in subsequent analyses

15 Monitor and improve work climate through sentiment analysis with AI

16 Use AI to eliminate biases in selection and evaluation, promoting inclusiveness

17 Facilitate organizational adaptation with AI support

18 Develop predictive analytics to anticipate staffing and resource needs

19 Apply ethical principles in the use of AI in Human Resources

20 Ensure transparency in the implementation of AI in HR processes

06

Structure and Content

The program will cover a wide range of essential topics, from the automation of personnel and payroll administration to the optimization of selection processes through artificial intelligence. Employers will learn about predictive analytics for talent management and the personalization of professional development, advanced techniques for evaluating performance and improving the work environment. In addition, they will explore the practical application of emerging technologies in recruitment and the elimination of biases, providing concrete tools to implement effective, data-driven solutions.

The content of the Executive Master's Degree has been carefully designed to address the strategic and operational needs of HR departments in the digital era"

Syllabus

The curriculum has been designed to equip professionals with the necessary skills to revolutionize personnel administration by integrating advanced technologies. They will be able to optimize payroll administration and personnel management using Artificial Intelligence. In this sense, they will be able to automate critical processes, ensure regulatory compliance and improve resource allocation. In addition, the application of AI in recruitment and selection processes will be addressed, using tools and techniques to automate the evaluation of resumes, conduct AI-assisted virtual interviews and eliminate biases in candidate selection.

It will also focus on talent management and professional development through the use of AI, so that employers are able to identify and retain key talent, customize development plans and use predictive analytics to manage competencies and skills gaps. It will also analyze how AI can support mentoring and virtual coaching, as well as facilitate the assessment of leadership potential and organizational change management.

In this way, TECH has created a comprehensive university program, in a fully online format, allowing graduates to access educational materials from any device with an Internet connection. This eliminates the need to travel to a physical location and adapt to predetermined schedules. In addition, it uses the revolutionary Relearning methodology, which focuses on the repetition of key concepts to ensure a complete understanding of the content.

This Executive Master's Degree takes place over 12 months and is divided into 20 modules:

Module 1	Fundamentals of Artificial Intelligence
Module 2	Data Types and Data Life Cycle
Module 3	Data in Artificial Intelligence
Module 4	Data Mining: Selection, Pre-Processing and Transformation
Module 5	Algorithm and Complexity in Artificial Intelligence
Module 6	Intelligent Systems
Module 7	Machine Learning and Data Mining
Module 8	Neural Networks, the Basis of Deep Learning
Module 9	Deep Neural Networks Training
Module 10	Model Customization and Training with TensorFlow

Module 11	Deep Computer Vision with Convolutional Neural Networks
Module 12	Natural Language Processing (NLP) with Recurrent Neural Networks (RNN) and Attention
Module 13	Autoencoders, GANs, and Diffusion Models
Module 14	Bio-Inspired Computing
Module 15	Artificial Intelligence: Strategies and Applications
Module 16	Personnel and Payroll Management with AI
Module 17	Selection Processes and Artificial Intelligence
Module 18	AI and Its Application in Talent Management and Professional Development
Module 19	Performance Evaluations
Module 20	Monitoring and Improving Work Climate with AI

Where, When and How is it Taught?

TECH offers the possibility to develop this Executive Master's Degree in Artificial Intelligence in Human Resources completely online. Throughout the 12 months of the educational program, the students will be able to access all the contents of this program at any time, allowing them to self-manage their study time.

A unique, key, and decisive educational experience to boost your professional development and make the definitive leap.

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 Inferences
2.1.2. Population, Sample, Individual
2.1.3. Variables: Definition, Measurement Scales

2.2. Types of Data Statistics
2.2.1. According to Type
2.2.1.1. Quantitative: Continuous Data and Discrete Data
2.2.1.2. Qualitative: Binomial Data, Nominal Data and Ordinal Data
2.2.2. According to Its Shape
2.2.2.1. Numeric
2.2.2.2. Text:
2.2.2.3. Logical
2.2.3. According to Its Source
2.2.3.1. Primary
2.2.3.2. Secondary

2.3. Life Cycle of Data
2.3.1. Stages of the Cycle
2.3.2. Milestones of the Cycle
2.3.3. FAIR Principles

2.4. Initial Stages of the Cycle
2.4.1. Definition of Goals
2.4.2. Determination of Resource Requirements
2.4.3. Gantt Chart
2.4.4. Data Structure

2.5. Data Collection
2.5.1. Methodology of Data Collection
2.5.2. Data Collection Tools
2.5.3. Data Collection Channels

2.6. Data Cleaning
2.6.1. Phases of Data Cleansing
2.6.2. Data Quality
2.6.3. Data Manipulation (with R)

2.7. Data Analysis, Interpretation and Evaluation of Results
2.7.1. Statistical Measures
2.7.2. Relationship Indexes
2.7.3. Data Mining

2.8. Datawarehouse
2.8.1. Elements that Comprise It
2.8.2. Design
2.8.3. Aspects to Consider

2.9. Data Availability
2.9.1. Access
2.9.2. Uses
2.9.3. Security

2.10. Regulatory Framework
2.10.1. Data Protection Law
2.10.2. Good Practices
2.10.3. Other Regulatory Aspects

Module 3. Data in Artificial Intelligence

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4.7. From Continuous to Discrete Attributes
4.7.1. Continuous Data Vs. Discreet Data
4.7.2. Discretization Process

4.8. The Data
4.8.1. Data Selection
4.8.2. Prospects and Selection Criteria
4.8.3. Selection Methods

4.9. Instance Selection
4.9.1. Methods for Instance Selection
4.9.2. Prototype Selection
4.9.3. Advanced Methods for Instance Selection

4.10. Data Pre-processing in Big Data Environments

Module 5. Algorithm and Complexity in Artificial Intelligence

5.1. Introduction to Algorithm Design Strategies
5.1.1. Recursion
5.1.2. Divide and Conquer
5.1.3. Other Strategies

5.2. Efficiency and Analysis of Algorithms
5.2.1. Efficiency Measures
5.2.2. Measuring the Size of the Input
5.2.3. Measuring Execution Time
5.2.4. Worst, Best and Average Case
5.2.5. Asymptotic Notation
5.2.6. Mathematical Analysis Criteria for Non-Recursive Algorithms
5.2.7. Mathematical Analysis of Recursive Algorithms
5.2.8. Empirical Analysis of Algorithms

5.3. Sorting Algorithms
5.3.1. Concept of Sorting
5.3.2. Bubble Sorting
5.3.3. Sorting by Selection
5.3.4. Sorting by Insertion
5.3.5. 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. Transfer Learning Training
9.2.2. Feature Extraction
9.2.3. Deep Learning

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

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

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

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

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

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

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

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

Module 10. Model Customization and Training with TensorFlow

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

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

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

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

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

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

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

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

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

10.10. Building a Deep Learning App with TensorFlow
10.10.1. Practical Application
10.10.2. Building a Deep Learning App with TensorFlow
10.10.3. Model Training with TensorFlow
10.10.4. 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. 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
11.10.1. 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 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. Personnel and Payroll Management with AI

16.1. Artificial Intelligence for Diversity and Inclusion in the Workplace
16.1.1. Diversity Analysis Using IBM Watson to Detect Trends and Biases
16.1.2. AI Tools for Detecting and Correcting Biases in HR Processes
16.1.3. Evaluating the Impact of Inclusion Policies using Data Analytics

16.2. Fundamentals of Personnel Administration with AI
16.2.1. Automation of Hiring and Onboarding Processes
16.2.2. Use of AI-Based Personnel Data Management Systems
16.2.3. Improving the Employee Experience through Intelligent Platforms

16.3. AI Technologies Applied to Payroll
16.3.1. AI Systems for Automated Payroll Calculation
16.3.2. Intelligent Profit Management with Platforms such as Gusto
16.3.3. Detection of Errors and Fraud in Payrolls Using AI Algorithms

16.4. Optimizing Resource Allocation with AI
16.4.1. Personnel Planning with Kronos Predictive Tools
16.4.2. AI Models for Shift and Task Assignment Optimization
16.4.3. Workload Analysis and Resource Allocation with Power BI

16.5. AI in HR Regulatory and Legal Compliance
16.5.1. Automation of Compliance with Labor Policies
16.5.2. AI Systems to Ensure Fairness and Transparency in HR
16.5.3. Contract and Regulatory Management with IBM Watson Legal Advisor

16.6. Predictive Analytics in Workforce Management
16.6.1. Predictive Models for Employee Retention with Retain's AI
16.6.2. Sentiment Analysis in Internal Communications
16.6.3. Predicting Training and Development Needs

16.7. Automating Benefits Management with AI
16.7.1. Benefits Administration Using Intelligent Platforms such as Zenefits
16.7.2. Customizing Benefit Packages using AI
16.7.3. Optimizing Benefit Costs Using Data Analytics

16.8. Integrating HR Systems with AI
16.8.1. Integrated Systems for Personnel Management with Salesforce Einstein
16.8.2. Interface and Usability in AI-Based HR Systems
16.8.3. Data Security and Privacy in Integrated Systems

16.9. AI-Supported Training and Development of Personnel
16.9.1. Adaptive and Personalized Learning Systems
16.9.2. AI-Powered E-Learning Platforms
16.9.3. Performance Assessment and Monitoring Using Intelligent Technologies

16.10. Crisis and Change Management with AI in HR
16.10.1. Using AI for Effective Management of Organizational Change
16.10.2. Predictive Tools for Crisis Preparedness with Predictive Layer
16.10.3. Data Analysis to Evaluate and Adapt HR Strategies in Times of Crisis

Module 17. Artificial Intelligence: Strategies and Applications

17.1. Introduction to the Application of Artificial Intelligence in Personnel Selection
17.1.1. Definition of Artificial Intelligence in the Human Resources Context. Entelo
17.1.2. Importance of Applying AI in Selection Processes
17.1.3. Benefits of Using AI in Selection Processes

17.2. Automating Tasks in the Recruitment Process
17.2.1. Using AI to Automate Job Postings
17.2.2. Implementing Chatbots to Answer Candidates' Frequently Asked Questions
17.2.3. Tools XOR

17.3. Resume Analysis with AI
17.3.1. Using AI Algorithms to Analyze and Evaluate Resumes. Talview
17.3.2. Automatic Identification of Skills and Experience Relevant to the Position
17.3.3. Advantages and Disadvantages

17.4. Candidate Filtering and Ranking
17.4.1. Applying AI to Automatically Filter Candidates Based on Specific Criteria. Vervoe
17.4.2. Ranking Candidates According to Suitability for the Position Using Machine Learning Techniques
17.4.3. Using AI for Dynamic Customization of Filtering Criteria based on Job Needs

17.5. Pattern Recognition on Social Networks and Professional Platforms
17.5.1. Using AI to Analyze Candidate Profiles on Social Networks and Professional Platforms
17.5.2. Identifying Behavioral Patterns and Trends Relevant to Recruiting
17.5.3. Assessing the Online Presence and Digital Influence of Candidates Using AI Tools

17.6. AI-Assisted Virtual Interviewing
17.6.1. Implementing Virtual Interviewing Systems with Language and Emotion Analysis. Talentoday
17.6.2. Automatic Evaluation of Candidate Responses Using Natural Language Processing Techniques
17.6.3. Developing Automatic and Personalized Feedback for Candidates Based on AI Interview Analysis

17.7. Evaluation of Skills and Competencies
17.7.1. Using AI-Based Assessment Tools to Measure Technical and Soft Skills. OutMatch
17.7.2. Automatically Analyzing Tests and Assessment Exercises Performed by Candidates. Harver
17.7.3. Correlation of Assessment Results with Success on the Job Using AI Predictive Analytics

17.8. Elimination of Selection Biases
17.8.1. Applying AI to Identify and Mitigate Unconscious Bias in the Selection Process
17.8.2. Implementing Unbiased and Fair AI Algorithms in Decision Making
17.8.3. Training and Continuous Tuning of AI Models to Ensure Fairness in Personnel Selection

17.9. Prediction of Fit and Retention
17.9.1. Using Predictive AI Models to Predict Candidate Suitability and Likelihood of Retention Hiretual
17.9.2. Analyzing Historical Data and Performance Metrics to Identify Patterns of Success
17.9.3. AI Models for Simulating Job Scenarios and Their Impact on Candidate Retention

17.10. Ethics and Transparency in AI Selection
17.10.1. Ethical Considerations in the Use of AI in the Personnel Selection Processes
17.10.2. Ensuring Transparency and Explainability in AI Algorithms Used in Hiring Decisions
17.10.3. Developing Audit and Review Policies for Automated Decisions

Module 18. AI and Its Application in Talent Management and Professional Development

18.1. Introduction to the Application of AI in Talent Management and Professional Development
18.1.1. Historical Evolution of AI in Talent Management and How It Has Transformed the Industry
18.1.2. Definition of Artificial Intelligence in the Human Resources Context
18.1.3. Importance of Talent Management and Professional Development. Glint

18.2. Automation of Talent Management Processes
18.2.1. Using AI to Automate Administrative Tasks in Talent Management
18.2.2. Implementing AI-Based Talent Management Systems
18.2.3. Assessing Operational Efficiency and Cost Reduction through Automation with AI

18.3. Talent Identification and Retention with AI
18.3.1. Using AI Algorithms to Identify and Retain Talent in the Organization
18.3.2. Predictive Analytics for the Detection of Employees with High Growth Potential
18.3.3. Integrating AI with HR Management Systems for Continuous Performance and Development Tracking

18.4. Personalization of Professional Development. Leader Amp
18.4.1. Implementing Customized AI-Based Professional Development Programs
18.4.2. Using Recommendation Algorithms to Suggest Learning and Growth Opportunities
18.4.3. Matching Career Development Pathways to Labor Market Evolution Predictions Using AI

18.5. Competency and Skill Gap Analysis
18.5.1 Using AI to Analyze Employees' Current Skills and Competencies
18.5.2. Identification of Skills Gaps and Training Needs Using Data Analytics
18.5.3. Implementing Real-Time Training Programs Based on Automated AI Recommendations

18.6. Mentoring and Virtual Coaching
18.6.1. Implementation of AI-Assisted Virtual Mentoring Systems. Crystal
18.6.2. Using Chatbots and Virtual Assistants to Provide Personalized Coaching
18.6.3. Impact Assessment of Virtual Coaching Using Data Analysis and Automated AI Feedback

18.7. Achievement and Performance Recognition
18.7.1. Using AI-Based Achievement Recognition Systems to Motivate Employees BetterUp
18.7.2. Automatically Analyzing Employee Performance and Productivity Using AI
18.7.3. Developing an AI-Based Reward and Recognition System

18.8. Evaluation of Leadership Potential
18.8.1. Applying AI Techniques to Assess Leadership Potential of Employees
18.8.2. Identifying Emerging Leaders and Developing Tailored Leadership Programs
18.8.3. Using AI-Driven Simulations to Train and Evaluate Leadership Skills

18.9. Change Management and Organizational Adaptability
18.9.1. Predictive Analytics to Anticipate Change Needs and Promote Organizational Resilience
18.9.2. Organizational Change Planning Using AI
18.9.3. Using AI to Manage Organizational Change and Promote Adaptability Cognician

18.10. Ethics and Accountability in Talent Management with AI
18.10.1. Ethical Considerations in the Use of AI in Talent Management and Professional Development. Reflektive
18.10.2. Ensuring Fairness and Transparency in AI Algorithms Used in Talent Management Decision-Making
18.10.3. Implementation of Audits to Monitor and Adjust AI Algorithms to Ensure Ethical Practices

Module 19. Performance Evaluations

19.1. Introduction to the Application of AI in Performance Appraisals
19.1.1. Definition of Artificial Intelligence and Its Role in Performance Appraisals. 15Five
19.1.2. Importance of Using AI to Improve the Objectivity and Efficiency of Appraisals
19.1.3. Limitations of AI in Performance Appraisals

19.2. Automation of Evaluation Processes
19.2.1. Using AI to Automate Data Collection and Analysis in Performance Appraisals Peakon
19.2.2. Implementing AI-Based Automated Evaluation Systems
19.2.3. Successful Studies in Automation with AI

19.3. Data Analysis and Performance Metrics
19.3.1. Using AI Algorithms to Analyze Performance Data and Trends
19.3.2. Identifying Key Metrics and KPIs Using Advanced Data Analysis Techniques
19.3.3. AI Data Analytics Training

19.4. Continuous Evaluation and Real-Time Feedback
19.4.1. Implementing AI-Assisted Continuous Assessment Systems. Lattice
19.4.2. Using Chatbots and Real-Time Feedback Tools to Provide Feedback to Employees
19.4.3. Impact of AI-Based Feedback

19.5. Identification of Strengths and Areas for Improvement
19.5.1. Applying AI to Identify Employee Strengths and Weaknesses
19.5.2. Automatic Analysis of Competencies and Skills Using Machine Learning Techniques. Workday Performance Management
19.5.3. Connection with Professional Development and Planning

19.6. Detection of Trends and Performance Patterns
19.6.1. Using AI to Detect Trends and Patterns in Employee Performance. TAlentSoft
19.6.2. Predictive Analytics to Anticipate Potential Performance Problems and Take Proactive Measures
19.6.3. Advanced Data Visualization Dashboards

19.7. Customization of Objectives and Development Plans
19.7.1. Implementing AI-Based Personalized Target Setting Systems. Reflektive
19.7.2. Using Recommendation Algorithms to Suggest Individualized Development Plans
19.7.3. Long-Term Impact of Personalized Targets

19.8. Elimination of Bias in Evaluations
19.8.1. Applying AI to Identify and Mitigate Bias in Performance Appraisals
19.8.2. Implementing Impartial and Equitable Algorithms in Evaluation Processes
19.8.3. AI Ethics Training for Evaluators

19.9. Data Security and Protection in AI Evaluations
19.9.1. Ethical and Legal Considerations in the Use of Personal Data in Performance Evaluations with AI. LEver
19.9.2. Ensuring the Privacy and Security of Employee Information in AI-Based Evaluation Systems
19.9.3. Implementing Data Access Protocols

19.10. Continuous Improvement and Adaptability of the System
19.10.1. Using Feedback and Data Analysis to Continuously Improve Evaluation Processes
19.10.2. Adapting Evaluation Systems as the Organization's Needs and Objectives Change
19.10.3. Review Committee for Adjustment of Metrics

Module 20. Monitoring and Improving Work Climate with AI

20.1. Applying AI in Workplace Climate Management
20.1.1. Definition and Relevance of Work Climate
20.1.2. Overview of AI in the Management of Workplace Climate
20.1.3. Benefits of Using AI to Monitor Workplace Climate

20.2. AI Tools for Workplace Data Collection
20.2.1. Real-Time Feedback Systems with IBM Watson
20.2.2. Automated Survey Platforms
20.2.3. Sensors and Wearables for Physical and Environmental Data Collection

20.3. Sentiment Analysis with AI
20.3.1. Fundamentals of Sentiment Analysis
20.3.2. Using Google Cloud Natural Language to Analyze Emotions in Written Communication
20.3.3. Applying Sentiment Analysis in Emails and Corporate Social Networks

20.4. Machine Learning for the Identification of Behavioral Patterns
20.4.1. Clustering with K-Means in Python for Segmenting Workplace Behaviors
20.4.2. Pattern Recognition in Behavioral Data
20.4.3. Predicting Trends in Work Climate

20.5. AI in the Proactive Detection of Workplace Problems
20.5.1. Predictive Models to Identify Conflict Risks
20.5.2. AI-Based Early Warning Systems
20.5.3. Detection of Harassment and Discrimination Using Text Analytics with spaCy

20.6. Improving Internal Communication with AI
20.6.1. Chatbots for Internal Communication
20.6.2. Network Analysis with AI to Improve Collaboration Using Gephi
20.6.3. AI Tools to Personalize Internal Communications

20.7. Change Management with AI Support
20.7.1. AI Simulations to Predict Impacts of Organizational Change with AnyLogic
20.7.2. AI Tools to Manage Resistance to Change
20.7.3. AI Models for Optimizing Change Strategies

20.8. Assessment and Continuous Improvement of Work Climate with AI
20.8.1. Continuous Work Climate Monitoring Systems
20.8.2. Algorithms for Analyzing the Effectiveness of Interventions
20.8.3. AI for the Customization of Work Climate Improvement Plans

20.9. Integration of AI and Organizational Psychology
20.9.1. Psychological Theories Applied to AI Analysis
20.9.2. AI Models for Understanding Motivation and Job Satisfaction
20.9.3. AI Tools to Support Employee Emotional Well-Being

20.10. Ethics and Privacy in the Use of AI to Monitor Workplace Climate
20.10.1. Ethical Considerations of Workplace Monitoring
20.10.2. Data Privacy and Regulatory Compliance
20.10.3. Transparent and Responsible Data Management

This comprehensive approach will equip you with key competencies to lead the digital transformation in HR and maximize the strategic value of your teams. With all the TECH quality guarantees!"

07

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"

TECH Business School uses the 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"

This program prepares you to face business challenges in uncertain environments and achieve business success.

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

A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch to present executives with challenges and business decisions at the highest level, whether at the national or international level. 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 business reality is taken into account.

> *You will learn, through collaborative activities and real cases, how to solve complex situations in real business environments"*

The case method has been the most widely used learning system among the world's leading business 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 we face in the case method, an action-oriented learning method. Throughout the program, the studies will be presented with multiple real cases. They must integrate all their knowledge, research, argue and defend their ideas and decisions.

Relearning Methodology

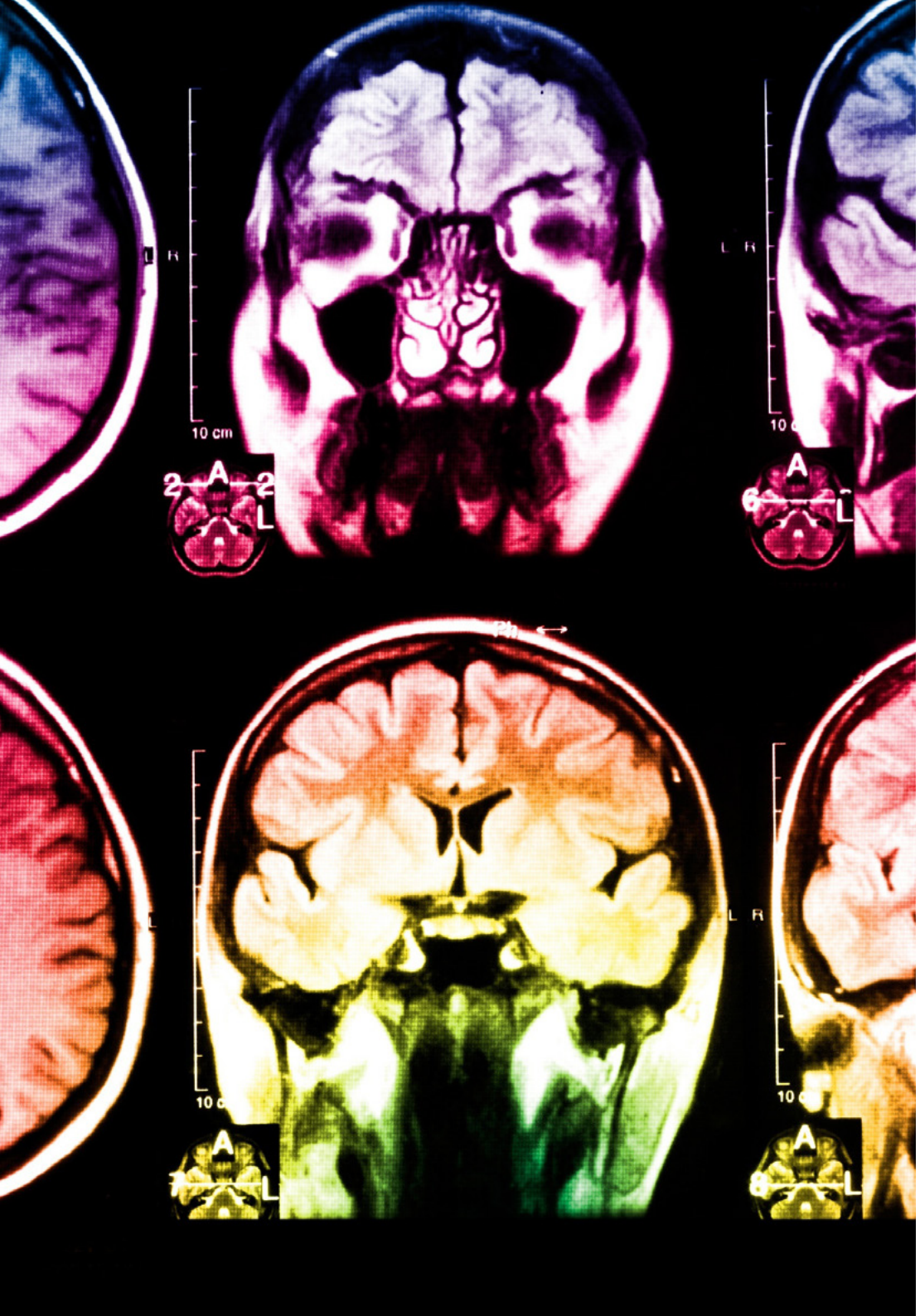
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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

Our online system will allow you to organize your time and learning pace, adapting it to your schedule. You will be able to access the contents from any device with an internet connection.

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 online business school is the only one in the world licensed to incorporate 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. With this methodology we have 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, markets, and financial 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 specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to 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.

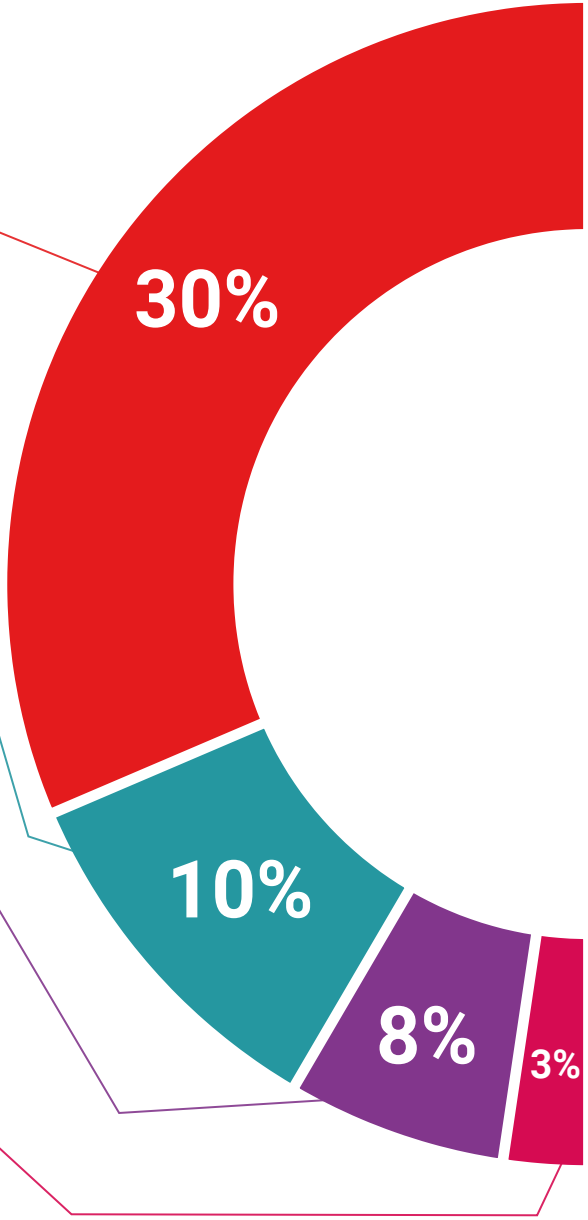
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

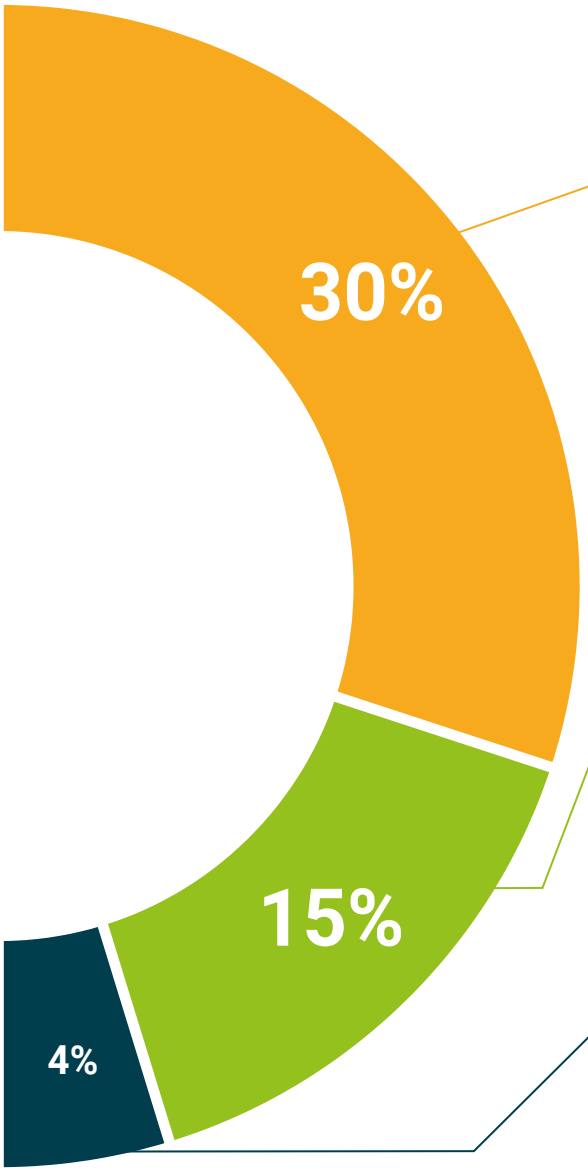
Management Skills Exercises

They will carry out activities to develop specific executive competencies in each thematic area. Practices and dynamics to acquire and develop the skills and abilities that a high-level manager needs to develop in the context of the globalization we live in.

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 senior management 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.

08

Our Students’ Profiles

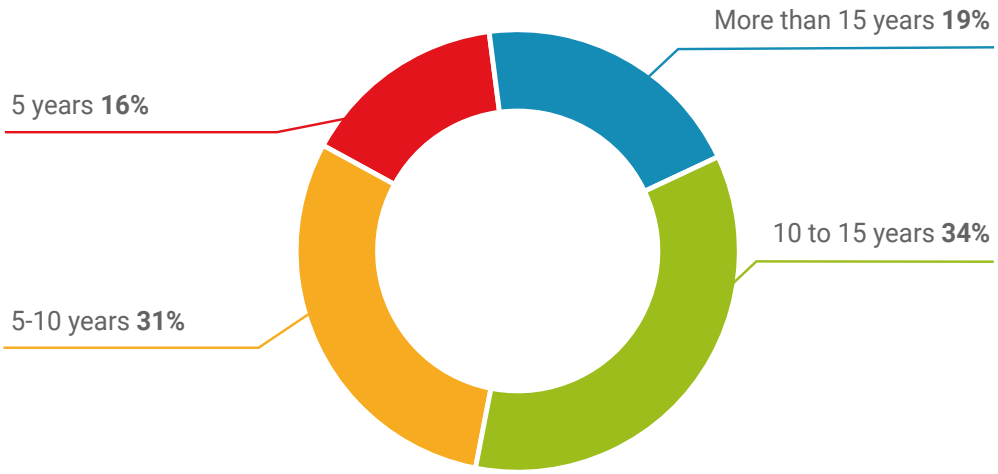
Students are typically HR directors, talent managers, people managers and other business leaders with prior industry experience who wish to update and expand their competencies in the use of artificial intelligence. These individuals have a strong background in HR and are motivated by the desire to implement innovative solutions that improve operational efficiency, recruitment equity and strategic talent development. Therefore, the diversity of participants with different academic profiles and coming from multiple nationalities will shape the multidisciplinary approach of this program.

The student profile for this Executive Master's Degree is composed of high-level professionals seeking to integrate advanced technologies in talent management and HR process optimization"

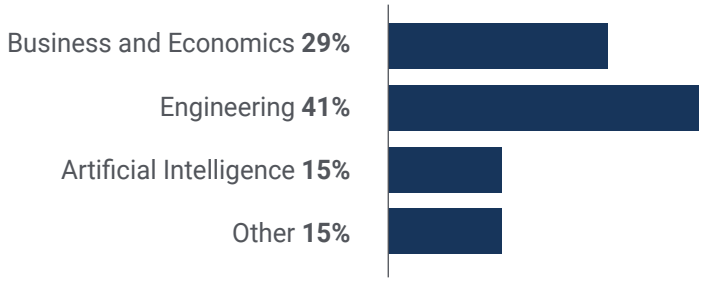
Average Age

Between **35** and **45** years old

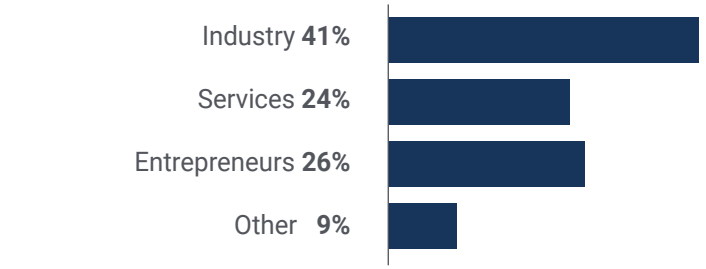
Years of Experience



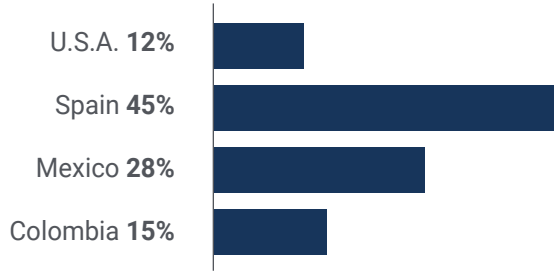
Training



Academic Profile



Geographical Distribution



Margarita Gutiérrez Castillo

Head of Personnel Administration

"I can say with complete confidence that the Executive Master's Degree in Artificial Intelligence in Human Resources Department has been a transformative experience. Not only did it provide me with a deep understanding of how AI can optimize my daily operations, but it also gave me practical tools to automate processes and improve accuracy in payroll and recruitment management. What impressed me most was how the knowledge gained has had an immediate impact on my efficiency in my job. Now, I feel more confident and prepared to lead the digital evolution. It has definitely paid off!"

09

Course Management

This Executive Master's Degree in Artificial Intelligence in Human Resources is taught by a high-level teaching team, composed of international experts and leaders in the field of AI and HR management. In fact, these professionals combine a solid academic background with a vast practical experience in the application of advanced technologies in corporate environments. Moreover, their expertise ranges from the development of AI algorithms and tools to the strategic implementation of these technologies in talent management and personnel administration.

This training will provide you with a cutting-edge academic perspective, as well as a practical and applicable vision, gaining relevant skills to face current and future challenges in your HR Department"

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. 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

10

Impact on Your Career

By mastering the use of AI to optimize key processes in talent management, personnel administration and performance evaluation, entrepreneurs will position themselves as leaders in the integration of advanced technologies within their organizations. They will also be able to implement innovative solutions that improve operational efficiency and strategic decision making, opening doors to new leadership opportunities in the sector. In addition, the ability to apply AI ethically and effectively will reinforce their reputation as visionary leaders, capable of meeting the challenges of an ever-changing business environment.

Pursuing this Executive Master's Degree will have a significant impact on your career, raising your professional profile and expanding your leadership opportunities, hand in hand with the best online university in the world, according to Forbes: TECH"

You will use predictive analytics tools to improve decision making, applying data processing techniques to customize professional development plans. What are you waiting for to enroll?

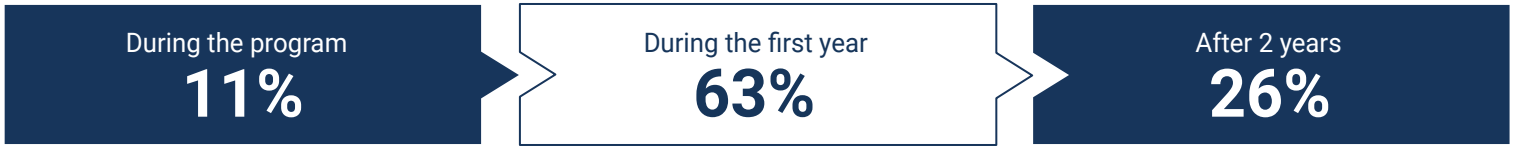
Are you ready to take the leap? Excellent professional development awaits you

The Executive Master's Degree in Artificial Intelligence in Human Resources from TECH is an intensive program that prepares you to face challenges and business decisions in the field of Artificial Intelligence applied to the Financial Department of companies. The main objective is to promote your personal and professional growth. Helping you achieve success.

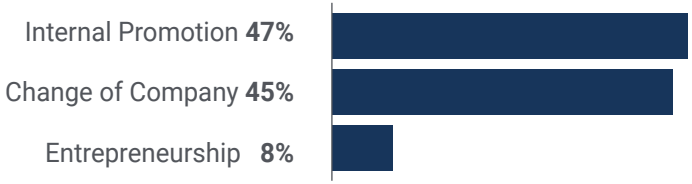
If you want to improve yourself, make a positive change at a professional level, and network with the best, then this is the place for you.

You will be trained in the use of emerging technologies to identify talent, analyze work climate and manage payroll with greater accuracy and efficiency, thanks to an extensive library of innovative multimedia resources.

Time of Change



Type of change



Salary increase

This program represents a salary increase of more than **26.24%** for our students

11

Benefits for Your Company

Professionals will be equipped with advanced knowledge on how to integrate AI technologies to optimize critical processes such as recruitment, payroll administration and performance evaluation. Therefore, their ability to automate tasks and use predictive analytics will enable companies to improve operational efficiency, reduce costs and make more informed data-driven decisions. In addition, by implementing innovative and customized solutions, they will increase accuracy in talent management, improve employee satisfaction and foster a more agile and adaptive organizational culture.

By taking this Executive Master's Degree, you will not only increase your company's operational efficiency, but also improve the accuracy and fairness of talent management"

Developing and retaining talent in companies is the best long-term investment.

01

Growth of talent and intellectual capital

The professional will introduce the company to new concepts, strategies, and perspectives that can bring about significant changes in the organization.

02

Retaining high-potential executives to avoid talent drain

This program strengthens the link between the company and the professional and opens new avenues for professional growth within the company.

03

Building agents of change

You will be able to make decisions in times of uncertainty and crisis, helping the organization overcome obstacles.

04

Increased international expansion possibilities

Thanks to this program, the company will come into contact with the main markets in the world economy.

05

Project Development

The professional can work on a real project or develop new projects in the field of R & D or business development of your company.

06

Increased competitiveness

This program will equip students with the skills to take on new challenges and drive the organization forward.

12

Certificate

The Executive Master's Degree in Artificial Intelligence in Human Resources guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.

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

This private qualification will allow you to obtain a **Executive Master's Degree diploma in Artificial Intelligence in Human Resources** 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: **Executive Master's Degree in Artificial Intelligence in Human Resources**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**


tech global university

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

Executive Master's Degree in Artificial Intelligence in Human Resources

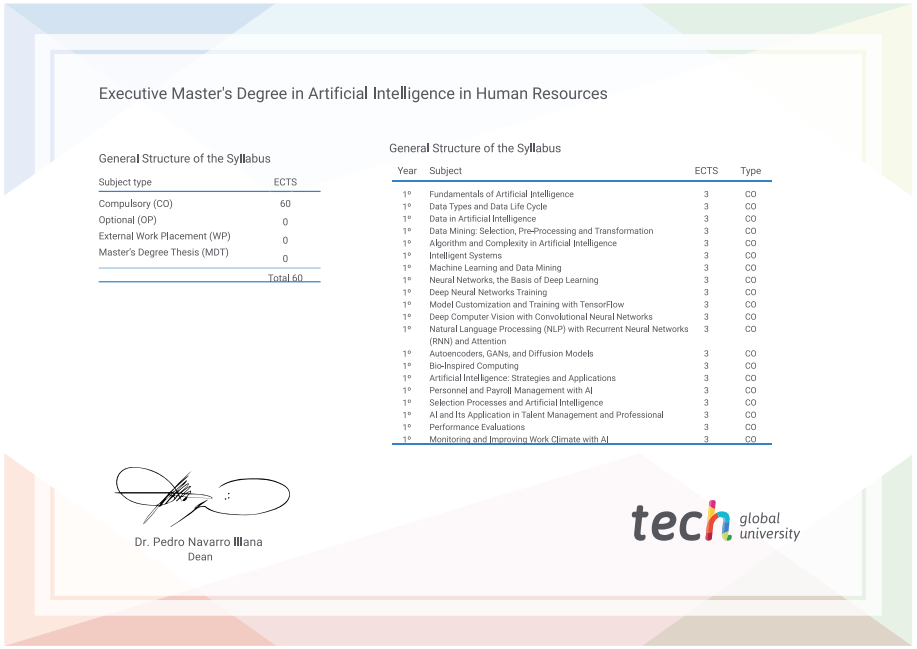
This is a private qualification of 1,800 hours of duration equivalent to 60 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

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


Executive Master's Degree in Artificial Intelligence in Human Resources

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
1º	Fundamentals of Artificial Intelligence	3	CO
1º	Data Types and Data Life Cycle	3	CO
1º	Data in Artificial Intelligence	3	CO
1º	Data Mining: Selection, Pre-Processing and Transformation	3	CO
1º	Algorithm and Complexity in Artificial Intelligence	3	CO
1º	Intelligent Systems	3	CO
1º	Machine Learning and Data Mining	3	CO
1º	Neural Networks, the Basis of Deep Learning	3	CO
1º	Deep Neural Networks Training	3	CO
1º	Model Customization and Training with TensorFlow	3	CO
1º	Deep Computer Vision with Convolutional Neural Networks	3	CO
1º	Natural Language Processing (NLP) with Recurrent Neural Networks (RNN) and Attention	3	CO
1º	Autoencoders, GANs, and Diffusion Models	3	CO
1º	Bio-Inspired Computing	3	CO
1º	Artificial Intelligence: Strategies and Applications	3	CO
1º	Personnel and Payroll Management with AI	3	CO
1º	Selection Processes and Artificial Intelligence	3	CO
1º	AI and Its Application in Talent Management and Professional	3	CO
1º	Performance Evaluations	3	CO
1º	Monitoring and Improving Work Climate with AI	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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Executive Master's Degree

Artificial Intelligence in Human Resources

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

Executive Master's Degree

Artificial Intelligence in Human Resources

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