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Sign Up

Certified Artificial Intelligence Professional (CAIP) Certification Training

5 days (35 hours)

Overview

Artificial intelligence enables you to transform data into decisions, recognize images, and automate complex tasks. Through machine learning, deep learning, natural language processing, and robotics, develop the technical skills and governance best practices necessary for responsible projects.

Our Certified Artificial Intelligence Professional (CAIP) Certification Training prepares you for the official certification of the same name, offered by PECB. It combines exam preparation, guided exercises, and real-world scenarios.

You will learn to analyze and visualize data, apply supervised, unsupervised, and reinforcement learning, and then build simple neural networks. You will also explore convolutional networks, natural language processing, computer vision, and expert systems.

Upon completion of the course, you will be able to compare models, interpret their results, and propose risk management measures tailored to privacy, security, and compliance challenges.

This course incorporates an ethical AI strategy aligned with your organization’s values and societal needs. Quizzes and a practice exam will help you reinforce what you’ve learned before taking the actual exam.

Like all our training courses, this one will introduce you to **the latest stable version** of the technology and its new features.

Objectives

- Explain the principles of artificial intelligence and select applications suited to business needs
- Prepare, analyze, and visualize data to support an AI project
- Apply supervised, unsupervised, and reinforcement learning to real-world problems
- Implement a simple neural network and a convolutional network, then interpret their results
- Evaluate approaches to natural language processing, computer vision, robotics, and expert systems
- Define a responsible AI strategy and prepare for the topics covered on the certification exam

Target Audience

- Python Developer
- Data Analyst
- Data Scientist
- AI Project Manager
- AI Governance Consultant

Prerequisites

- Basic knowledge of programming in Python and working with functions and collections
- Basic understanding of descriptive statistics, probability, and matrix algebra
- Experience working with tabular data and interpreting graphs
- Ability to read technical English to make use of instructional resources

Technical Prerequisites

- Computer running Windows 11, macOS, or Ubuntu 24.04 LTS with installation privileges
- A quad-core processor, 16 GB of RAM, and 10 GB of available disk space are recommended for the workshops
- Learning environment with Python 3.11, JupyterLab, NumPy, pandas, Matplotlib, scikit-learn, and PyTorch installed according to the provided instructions
- Stable internet connection and Chrome or Firefox browser allowing access to learning resources, without blocking the services used
- For the remote exam: a myPECB account, the PECB Exams app, and a webcam, with of device compatibility

Curriculum for our Certified Artificial Intelligence Professional (CAIP) training

[Day 1 - Morning]

Fundamentals of Artificial Intelligence

- Overview of the Certified Artificial Intelligence Professional (CAIP) certification and organization of review sessions by subject area
- Principles of AI, machine learning, and deep learning
- Symbolic and statistical approaches, knowledge representation, and reasoning
- Business applications, system limitations, and the distinction between automation and learning
- Hands-on Workshop: Analyze various business needs and justify the choice of an AI approach based on certification preparation scenarios.

[Day 1 - Afternoon]

Data Analysis and Visualization

- Data manipulation with NumPy and pandas in a notebook
- Handling missing values, duplicates, outliers, and variable types
- Descriptive statistics, distributions, and interpreting correlations
- Choosing relevant visualizations and separating data to prevent information leakage
- Hands-on Workshop: Clean a dataset, create three visualizations, and present findings useful for framing a model.

[Day 2 - Morning]

Supervised learning and evaluation

- Formulating a regression or classification problem based on a business objective
- Preprocessing, encoding, and normalization in a scikit-learn pipeline
- Linear regression, logistic regression, decision trees, and random forests
- Cross-validation, overfitting, regularization, and selection of performance metrics
- Hands-on Workshop: Compare two supervised models, analyze their errors, and justify a selection using appropriate metrics.

[Day 2 - Afternoon]

Unsupervised and Reinforcement Learning

- Objectives of unsupervised learning and exploration of unlabeled structures
- Segmentation with k-means, dimensionality reduction with PCA, and limitations of interpretation
- Evaluation of clusterings and an introduction to anomaly detection
- Reinforcement learning, agents, environments, rewards, and the exploration-exploitation trade-off
- Hands-on Workshop: Build a segmentation model, then implement a Q-learning agent in a simplified environment and analyze its rewards.

[Day 3 - Morning]

Neural Networks and Deep Learning

- Structure of a neural network, layers, weights, and activation functions
- Loss function, backpropagation, gradient descent, and optimizers
- Training loop with PyTorch, data batches, and validation monitoring
- Preventing overfitting using dropout, regularization, and early stopping
- Hands-on Workshop: Implement a simple multilayer perceptron, plot learning curves, and measure the effect of two settings.

[Day 3 - Afternoon] Natural

Language Processing

- NLP processing pipeline, text cleaning, tokenization, and representation
- TF-IDF vectorization, lexical embeddings, and document classification
- Principles of recurrent networks, attention mechanisms, and Transformer architectures
- Sentiment analysis, entity extraction, and limitations of language models, including hallucinations
- Hands-on Workshop: Build a text classifier, examine errors, and answer a contextualized quiz on NLP architectures.

[Day 4 - Morning]

Computer Vision and Convolutional Neural Networks

- Image representation, pixels, channels, and preprocessing operations
- Distinction between classification, object detection, and segmentation
- CNN architecture, convolutions, filters, pooling, and output layers
- Data augmentation, transfer learning, and evaluation on unseen images
- Hands-on Workshop: Implement a small image classification CNN, measure its performance, and analyze misclassified examples.

[Day 4 - Afternoon] Robotics

and Expert Systems

- Fundamentals of robotics, sensors, actuators, and control loops
- The relationship between perception, planning, and decision-making in an autonomous system
- Components of an expert system, knowledge base, and inference engine
- Forward chaining, backward chaining, and the complementarity between business rules and learned models
- Hands-on workshop: Develop a simple rule engine to control a simulated robot and test its decisions in various situations.

[Day 5 - Morning]

Security, compliance, and responsible strategy

- Identifying AI risks, data poisoning, adversarial attacks, and prompt injection
- Protecting data and models through access control, input validation, and human
- Compliance benchmarks, GDPR, the AI Act, and obligations to consider based on the context of use
- Ethics and governance, fairness, explainability, accountability, and trade-offs related to societal impacts
- Hands-on Workshop: Building a Risk Register and a Responsible AI Roadmap Aligned with an organization’s values, objectives, and stakeholders.

[Day 5 - Afternoon]

Final certification training

- Summary of competency areas and consolidation of technical and governance concepts
- Methods for solving multiple-choice questions and contextualized scenarios
- Time management, organization of authorized reference materials, and identifying distractors
- Procedures for taking the official exam, scheduling based on the exam notice, and the distinction between passing the exam and receiving the certification
- Hands-on workshop: Take a timed practice exam, then use the annotated answer key to develop an individual study plan.

Target Companies

This training is intended for both individuals and companies—large or small—seeking to train their teams in new, advanced IT technology or to acquire specific professional knowledge or modern methods.

Entry-Level Assessment

The pre-training assessment complies with Qualiopi quality standards. Upon final registration, the learner receives a self-assessment questionnaire that allows us to evaluate their estimated proficiency in various types of technologies, as well as their expectations and personal goals regarding the upcoming training, within the limits imposed by the selected format. This questionnaire also allows us to anticipate certain connection or internal security issues within the company (intra-company or virtual classroom) that could pose challenges for monitoring and ensuring the smooth operation of the training session.

Teaching Methods

Hands-On Training: 60% Hands-On, 40% Theory. Training materials distributed in digital format to all participants.

Organization

The course alternates between theoretical presentations by the instructor, supported by examples and

reflection sessions and group work.

Assessment

At the end of the session, a multiple-choice quiz is administered to verify that participants have successfully acquired the skills.

Certification

A certificate will be issued to each trainee who has completed the entire training program.

Training organization registered under number 11 75 54743 75. This registration does not constitute state accreditation.
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