AI Consulting and Software Engineering Basics

Python für KI · Anbieter: IU Akademie IU Internationale Hochschule

FÖRDERUNG & KOSTEN

Kurspreis: auf Anfrage

Förderfähig über: Bildungsgutschein

AZAV-zertifizierter Bildungsträger — Förderung durch die Agentur für Arbeit möglich

Kursdaten auf einen Blick

Durchführung	Online
Lernformat	Self-Paced
Dauer	6 Monate in Vollzeit oder 12 Monate in Teilzeit
Unterrichtssprache	Deutsch, Englisch
Kursstart	Startet alle 14 Tage
Vorkenntnisse	Keine Vorerfahrung
Abschluss	Zeugnis auf Hochschulniveau
Inklusive	Berufscoaching, Notebook / Tablet (geliehen)

Bildungsträger & Kontakt

IU Akademie IU Internationale Hochschule

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Kurs online ansehen

01 Kursbeschreibung

Die Zukunft der Technologie entwickelt sich rasant und Künstliche Intelligenz (KI) steht im Zentrum dieser Transformation. Du hast das Potenzial dieses Wandels bereits erkannt und auch viele Unternehmen sind auf der Suche nach Expert:innen in diesem Bereich. Deshalb benötigen sie zukünftig Dich. Mit Deiner Online-Weiterbildung AI Consulting and Software Engineering Basics bringst Du Innovation und Fortschritt in Unternehmen. Du machst Künstliche Intelligenz und Software Engineering zu wichtigen Instrumenten für den Unternehmenserfolg. Dein Know-how wird das Rückgrat der digitalen Strategien der Zukunft bilden. In Deiner Weiterbildung AI Consulting and Software Engineering Basics lernst Du die Grundlagen der Python-Programmierung, die in vielen Bereichen von der Webentwicklung bis zur wissenschaftlichen Datenanalyse eingesetzt wird. Im Modul Machine Learning erhältst Du einen tiefen Einblick in die verschiedenen Lernansätze und Methoden, die Maschinen befähigen, Muster in Daten zu erkennen und daraus zu lernen. Im Seminar zu aktuellen Themen in der KI setzt Du Dich kritisch mit den neuesten Entwicklungen in diesem Bereich auseinander. Mit dem Modul Deep Learning tauchst Du in die Welt der neuronalen Netzwerke ein und lernst, wie diese trainiert werden. Im Modul Software Engineering for Data Intensive Sciences lernst Du agile Projektmanagementmethoden und DevOps kennen und erfährst, wie Du hochwertigen Code für eine professionelle Produktionsumgebung erstellst. Abschließend erhältst Du einen Überblick über die Prinzipien der Datenverarbeitung im großen Maßstab und die gängigen Cloud-Plattformen.

02 Lehrplan & Module

1. Programming with Python

Python is one of the most versatile and widely used scripting languages. Its clean and uncluttered syntax as well as its straightforward design greatly contribute to this success and make it an ideal language for programming education. Its application ranges from web development to scientific computing. Especially in the fields of data science and artificial intelligence, it is the most common programming language supported by all major data-handling and analytical frameworks. This course provides a thorough introduction to the language and its main features, as well as insights into rationale and application within important libraries related to data science and artificial intelligence and important adjacent concepts such as environments, testing, and version control.
Kursinhalte
Introduction to Python Data Structures
Functions
Flow Control
Input / Output
Modules and Packages
Classes and Inheritance Scopes and Namespaces
Classes and Inheritance
Iterators and Generators
Python Important Libraries Standard Python Library
Scientific Calculations
Machine Learning Libraries
Data Visualization
Accessing Databases
Errors and Exceptions Syntax Errors
Handling and Raising Exceptions
User-Defined Exceptions
Working with Python Virtual Environments
Managing Packages
Unit and Integration Testing
Documenting Code
Version Control Introduction to Version Control
Version Control with GIT
Fakten zum Modul: Niveau: Master · Unterrichtssprache: English · 5 ECTS-Punkte · Modulprüfung: Hausarbeit

2. Machine Learning

Machine learning is a field of scientific study concerned with algorithmic techniques that enable machines to learn performance on a given task via the discovery of patterns or regularities in exemplary data. Consequently, its methods commonly draw upon a statistical basis in conjunction with the computational capabilities of modern computing hardware.
This course aims to acquaint the student with the main branches of machine learning and provide a thorough introduction to the most widely used approaches and methods in this field.
Kursinhalte
Introduction to Machine Learning Regression & Classification
Supervised & Unsupervised Learning
Reinforcement Learning
Clustering Introduction to clustering
K-Means
Expectation Maximization
DBScan
Hierarchical Clustering
Regression Linear & Non-linear Regression
Logistic Regression
Quantile Regression
Multivariate Regression
Lasso & Ridge Regression
Support Vector Machines Introduction to Support Vector Machines
SVM for Classification
SVM for Regression
Decision Trees Introduction to Decision Trees
Decision Trees for Classification
Decision Trees for Regression
Genetic Algorithms Introduction to Genetic Algorithms
Applications of Genetic Algorithms
Fakten zum Modul: Niveau: Master · Unterrichtssprache: English · 5 ECTS-Punkte · Modulprüfung: Examen, 90 Minuten

3. Deep Learning

Neural networks and deep learning approaches have revolutionized the fields of data science and artificial intelligence in recent years, and applications built on these techniques have reached or surpassed human performance in many specialized applications.
After a short review of the origins of neural networks and deep learning, this course will cover the most common neural network architectures and discuss in detail how neural networks are trained using dedicated data samples, avoiding common pitfalls such as overtraining.
The course includes a detailed overview of alternative methods to train neural networks and further network architectures which are relevant in a wide range of specialized application scenarios.
Kursinhalte
Introduction to Neural Network and Deep Learning The Biological Brain
Perceptron and Multi-Layer Perceptrons
Network Architectures Feed-Forward Networks
Convolutional Networks
Recurrent Networks, Memory Cells and LSTMs
Neural Network Training Weight Initialization and Transfer Function
Backpropagation and Gradient Descent
Regularization and Overtraining
Alternative Training Methods Attention
Feedback Alignment
Synthetic Gradients
Decoupled Network Interfaces
Further Network Architectures Generative Adversarial Networks
Autoencoders
Restricted Boltzmann Machines
Capsule Networks
Spiking Networks
Fakten zum Modul: Niveau: Master · Unterrichtssprache: English · 5 ECTS-Punkte · Modulprüfung: Mündliche Prüfung

4. Seminar: Current Topics in AI

The topic of artificial Intelligence (AI) has been addressed in computer science and cognitive science research since the 1950s; however, the meaning associated with the term has changed considerably over time. Having once been predominantly associated with logical calculus, reasoning, and planning, AI is now primarily interpreted in the context of deep networks of computational units. Despite these changes in approach, the important characteristic of AI continues to be the understanding and reproduction of cognitive abilities and functions by machines. This seminar strives to elucidate current research trends in AI. The students learn to independently analyze selected topics and case studies and link them with well-known concepts, as well as critically question and discuss them.
Kursinhalte
The seminar covers current topics in artificial intelligence. Each participant must write a seminar paper on a topic assigned to him/her.
Fakten zum Modul: Niveau: Master · Unterrichtssprache: English · 5 ECTS-Punkte · Modulprüfung: Forschungsbericht

5. Software Engineering for Data Intensive Sciences

Building a successful data-based product requires a significant amount of high-quality code which needs to run in a professional production environment. This course starts by introducing the agile approaches Scrum and Kanban and then discusses the shift from more traditional software development approaches to the DevOps culture.
Special focus is given to the discussion and understanding of techniques and approaches for producing high-quality code such as unit and integration testing, test-driven development, pair programing, and continuous delivery and integration.
Since many software artefacts are accessed via APIs, this course introduces concepts of API design and paradigms.
Finally, this course addresses the challenges of bringing code into a production environment, building a scalable environment, and using cloud-cased approaches.
Kursinhalte
Agile Project Management Introduction to SCRUM
Introduction to Kanban
DevOps Traditional lifecycle management
Bringing development and operations together
Impact of team structure
Building a DevOps infrastructure
Software Development Unit & integration test, performance monitoring
Test-driven development & pair programing
Continuous delivery & integration
Overview of relevant tools
API API design
API paradigms
From Model to Production Building a scalable environment
Model versioning and persistence
Cloud-based approaches
Fakten zum Modul: Niveau: Master · Unterrichtssprache: English · 5 ECTS-Punkte · Modulprüfung: Mündliche Prüfung

6. Data Engineering

The focus of this first course in the Data Engineering elective module is to introduce students to important principles, concepts, methods and approaches in this subject domain.
In order to achieve this goal, the course moves from an exposition of the foundational principles of data engineering to a thorough treatment of the core data processing classes. Modern architectural paradigms such as Microservices are explained, and important factors in data governance and protection are addressed. In this context, students are enabled to reflect on modern data protection principles and their societal implications and implement these principles into large-scale data-intensive systems. Aspects of cloud computing are introduced via an overview of the most common offerings on the market. Finally, a state-of-the-art agile perspective on the operation of data pipelines is given by an exposition to the emerging notion of DataOps and the productivity tools around it to facilitate working in interdisciplinary teams.
Kursinhalte
Foundations of Data Systems Reliability
Scalability
Maintainability
Data Processing at Scale Batch Processing
Stream and Complex Event Processing
Microservices Introduction to Microservices
Implementing Microservices
Governance & Security Data Protection
Data Security
Data Governance
Common Cloud Platforms & Services Amazon AWS
Google Cloud
Microsoft Azure
Data Ops Defining Principles
Containerization
Building Data Pipelines
Fakten zum Modul: Niveau: Master · Unterrichtssprache: English · 5 ECTS-Punkte · Modulprüfung: Mündliche Prüfung

03 Enthaltene Zertifikate

Trägerzertifikat: Zeugnis auf Hochschulniveau

04 Voraussetzungen

Vorkenntnisse

Niveau: Keine Vorerfahrung

Zulassungsvoraussetzung: gute Deutschkenntnisse auf B2-Niveau.

Zugangsempfehlung: Englisch auf B2 Niveau; Advanced Mathematics

Die Weiterbildung ist auf dem inhaltlichen Niveau eines Master Studiengangs. Eine Weiterbildung auf Master-Niveau ist anspruchsvoller als auf Bachelor-Niveau. Vorhandenes Grundlagenwissen im gewählten Fachbereich ist deshalb von Vorteil.

Technische Voraussetzungen

Laptop mit Internetzugang.

05 Zielgruppen & Berufsperspektiven

- Arbeitssuchende
- Fachkräfte

Mögliche Berufsbilder: Data Engineer, Softwareentwickler, KI-Spezialist

NÄCHSTER SCHRITT

Kursdetails online ansehen und Anbieter kontaktieren

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