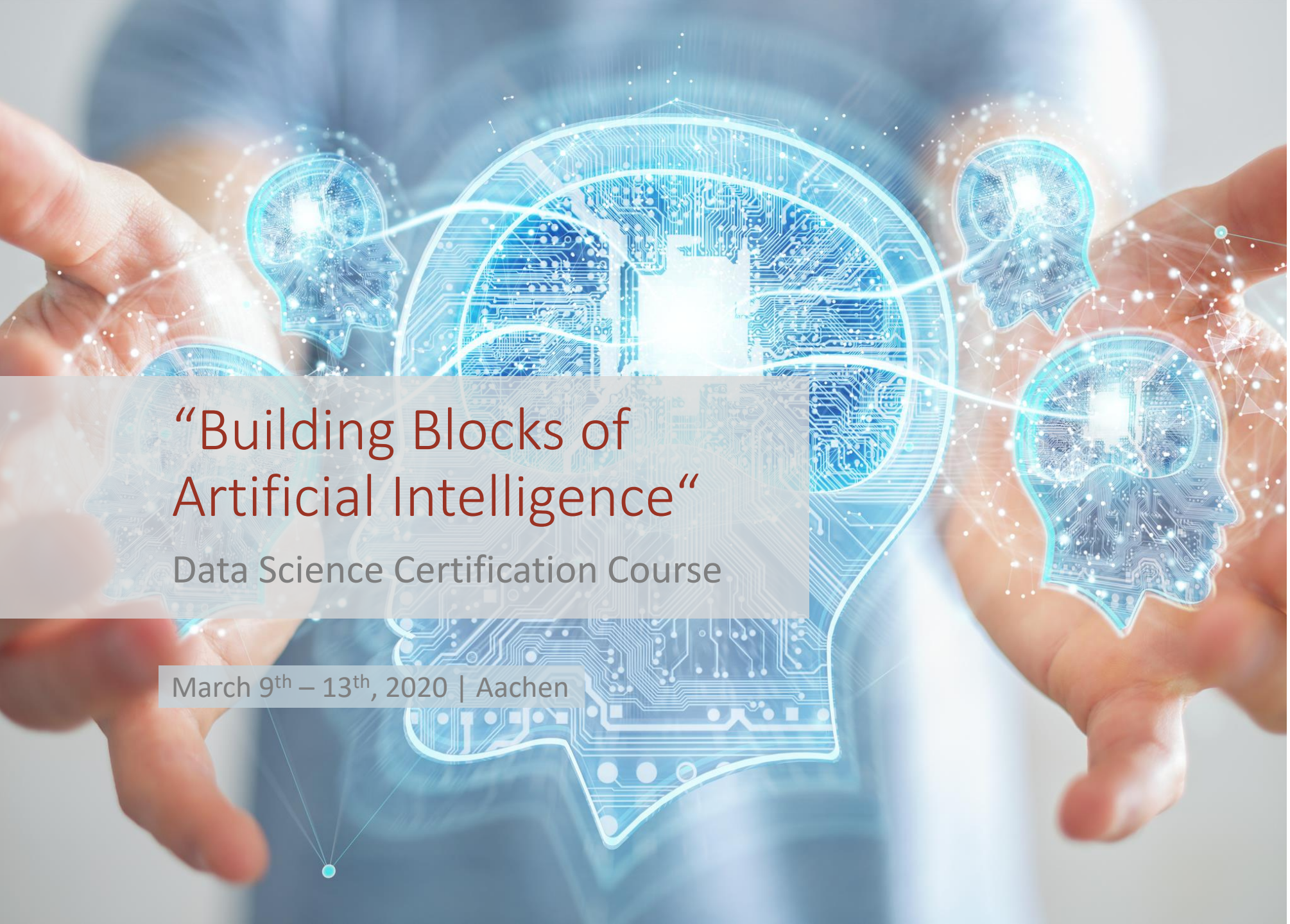

“Building Blocks of Artificial Intelligence“

Data Science Certification Course

March 9th – 13th, 2020 | Aachen

KEX. Knowledge Exchange®

IfU | IMA | RWTH AACHEN UNIVERSITY

Last chance to join our 5-day course **“Data Science for Engineers”**

Data Science Certification Course

Data Science for Engineers

Target audience

Developers and engineers who want to get into machine learning and AI

Prerequisite for participation

- First programming experience
- Basic knowledge of database technologies
- Basic knowledge of statistics

Key Learnings

- How to set up a data integration pipeline
- Hands-on data science methods with Python
- How to transfer industry use cases to data analytics problems

➢ Participants will receive a RWTH Aachen Certificate

Date & Duration

09 – 13 March 2020 (5 days)

Venue

Cybernetic Lab Aachen (RWTH Aachen University)
Aachen, Germany

General Topic of the Course

In the context of industrial manufacturing, continuous improvement of running processes is becoming increasingly important, e.g. to maintain machines with foresight or to improve production processes sustainably. Participants discover what data science is all about. They learn basic methods of preprocessing data and can evaluate them using artificial intelligence approaches. They develop an understanding of the application of machine learning techniques and can successfully master practical applications in production. Using hands-on examples from industrial practice, the participants gain further experience in the field of applied machine learning.

Didactic concept

The course consists of theory and group discussions in one half and independent programming parts in the other half, in which the participants apply what they have learned under the guidance of the instructors. An exam will close the course.

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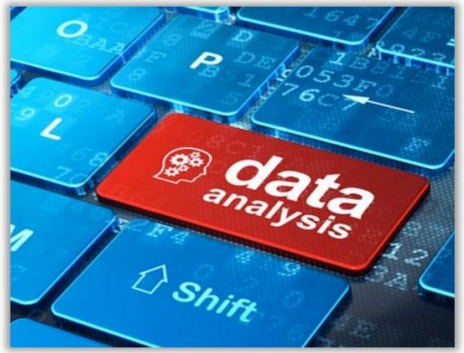

Certification Course – "Advanced"

Data Science for Engineers

Certification Course – Data Science for Engineers

Topics & Program

Program – 5 Day Course

Monday	
Morning	Industry 4.0, Cyber-Physical System & Data Analytics
Afternoon	Information Integration in Industrial Networks
Tuesday	
Morning	Introduction to Big Data
Afternoon	Data Mining & Knowledge Discovery in Databases
Wednesday	
Morning	Python & Database Programming Basics
Afternoon	Motivation to Machine Learning & Artificial Intelligence
Thursday	
Morning	Machine Learning Basics & Supervised Learning
Afternoon	Unsupervised Learning & Reinforcement Learning
Friday	
Morning	Deep Learning & Artificial Neural Networks
Afternoon	Applications of Reinforcement Learning & Deep Learning

Monday

09:00	Welcome, Presentation of the Trainers & Introduction of the Participants
09:30	Introduction to the Training & Expectations
09:45	Industry 4.0 and Data Analytics – Insights for the future production
10:30	*Coffee Break*
10:45	The way to the future production – The data integration & analytics pipeline
11:00	Introduction to the Internet of Things and MQTT & Node-RED
12:00	*Lunch Break*
13:00	Practical Session: Setting up integration pipelines with Node-RED
13:45	Hands-On: Data Integration with Publish-Subscribe using MQTT
14:30	Communication in Industrial Networks – From Brownfield to Industry 4.0
15:00	*Coffee Break*
15:15	Modeling of a Production Process
15:45	Semantic Information Integration using OPC UA
16:30	Feedback, Discussion& End of Day 1

Certification Course – Data Science for Engineers

Topics & Program

Tuesday

09:00	Introduction to Industrial Big Data
09:45	Towards Big Data Architectures – Scalability for Industrial Data Integration
10:15	*Coffee Break*
10:30	Parallelize Jobs with Map Reduce – Hadoop and Spark
11:00	Big Data Ecosystems – From Platform as a Service to Service as a Service
11:30	Big Data Cluster in a Nutshell – The Raspberry Pi Demonstrator
12:00	*Lunch Break*
13:00	Different Data Types and Formats
13:30	Data Analytics
13:45	Knowledge Discovery in Databases
14:30	Landscape: Data Mining Tools & Visual Analytics
15:00	Coffee Break
15:15	Hands on: Data Mining with Python
16:30	Conclusion & End of Day 2

Wednesday

09:00	Introduction to Python Programming
09:45	Fundamentals of Databases
10:15	*Coffee Break*
10:30	Introduction to Pandas
11:00	Fundamentals of Python Data Analytics and Database Interaction
12:00	*Lunch Break*
13:00	Basic Data Analytics algorithms and Learning from Data
13:30	Data Visualization of data and Visual Analytics
14:00	Data visualization with Python: Hands-On-Part 1: Matplotlib
15:00	*Coffee Break*
15:15	Data visualization with Python: Hands-On-Part 2: Seaborn
16:30	Conclusion & End of Day 2

Certification Course – Data Science for Engineers

Topics & Program

Thursday

09:00	Hands-On: Visual Data Exploration of data with Python
10:30	*Coffee Break*
10:45	Introduction to Machine Learning
11:15	Supervised Learning – Theory & Examples
12:00	*Lunch Break*
13:00	Model Evaluation & Model-Tuning for Machine Learning Analytics – Part 1
14:00	Supervised Learning – Practical Implementation & Hands-On
15:15	*Coffee Break*
15:45	Unsupervised Learning – Theory & Examples
16:15	Unsupervised Learning – Implementation
17:00	End of Day 4

Friday

09:00	Deep Learning
10:00	Introduction to the Use Case Deepdrawing
10:30	*Coffee Break*
10:45	Exploration, selection & cleansing
12:00	Exam
12:30	*Lunch Break*
13:30	Labeling & Transformation
14:15	Classification using Artificial Neural Networks
16:00	Outlook: Crack Prediction using Recurrent Neural Networks
16:15	Wrap-Up of the seminar, discussion and Q&A
17:00	End of Seminar

Data Science Certification Courses

Organizational Information

Training entities

KEX Knowledge Exchange AG
Professional technology and market information provider founded 2012 as a spin-off of the Fraunhofer IPT brings in more than 20 years of experience from Aachen institutes in various disciplines in information research, evaluation and interpretation.

Cybernetics Lab IMA & IfU
The Chair of Information Management in Mechanical Engineering (IMA) with its integrative approach of information and knowledge management is complemented by the procedures of the An-Institut für Unternehmenskybernetik e.V. (IfU) since four decades.

Your Contact

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KEX AG - Project Leader

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+49 241 51038 631

Venue

Cybernetic Lab Aachen
(RWTH Aachen University)

Technologiezentrum am Europaplatz
Dennewartstraße 27
52068 Aachen, Germany

Participation fee

Total fee per participant: 3200 €
The fee includes conference documents, break refreshments and lunch.

Seminar Language

German / English
(depending on the participants; workshop documentation will be in English)

Registration & Further Information

Please reach out to Marius Heidweiler for further information

The number of participants is limited. The registrations will be considered by the order of their reception.