MACHINE LEARNING COURSE

- **Introductory course:**
Dates: June 19-21, 2023
Time: 9:00-12:00 and 13:00-16:00
Location: Karlsruhe, Germany*

- **Advanced course:**
Dates: June 26-28, 2023
Time: 9:00-12:00 and 13:00-16:00
Location: Karlsruhe, Germany*

- **Course language:** English

- **Price (per person):**
Single course (3 days): 1,300 €
Entire training course (6 days): 2,500 €

* If the COVID-19 restrictions in place at the time of the courses do not allow in-person events, the courses will take place online.

INFO & REGISTRATION

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KNOWLEDGE TRANSFER UPPER RHINE

In the EU project KTUR (Knowledge Transfer Upper Rhine), 12 university partners from Germany, France and Switzerland have joined forces to intensify their cooperation in cross-border knowledge and technology transfer.

Besides conducting excellent research, the universities in the Upper Rhine region also offer numerous high-quality continuing education programs in various disciplines. Within the framework of KTUR, the partners have consolidated their competencies in the field of continuing education and propose application-oriented continuing education courses based on the current needs of the companies in the border region.

WWW.KTUR.EU

KTUR

MACHINE LEARNING COURSE

Explore the world of Machine Learning and put the methods and concepts you have learned directly into use with practical exercises on real-world data.

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INTRODUCTORY COURSE

The aim of this course is to familiarize yourself with the topics of Machine Learning and Artificial Intelligence. You will acquire the theoretical basics and apply them directly through practical exercises on real data. You will learn how to process data and classical algorithms. We will use Python, Scikit-learn and Kaggle.

DETAILS:

DAY 1 - JUNE 19, 2023

9:00 – 12:00
T: Introduction to Artificial intelligence
PW: Data understanding with small datasets

13:00 – 16:00
T: Regression algorithms
PW: Implementation of one-dimensional and multi-dimensional regression algorithms

DAY 2 - JUNE 20, 2023

9:00 – 12:00
T: Classification algorithms
PW: Prediction of semiconductor production yield

13:00 – 16:00
T: Clustering algorithms
PW: Evaluation of clustering algorithms

DAY 3 - JUNE 21, 2023

9:00 – 12:00
T: Time series analysis
PW: Analysis of Covid19 infection rates

13:00 – 16:00
T: Neural Networks: Multilayer perceptron
PW: Character recognition with neural networks

T: Theory - PW: Practical Work

ADVANCED COURSE

The aim of this course is to develop an understanding of deep learning and data visualisation. You will gain theoretical knowledge of the different components and architectures of neural networks and apply it to real-world data via supervised and unsupervised approaches. We will use Python and Tensorflow.

DETAILS:

DAY 4 - JUNE 26, 2023

9:00 – 12:00
T: Introduction to Deep Learning, Convolutional Neural Networks
PW: Segmentation and classification

13:00 – 16:00
T: Architectures and cost functions
PW: Regression and classification

DAY 5 - JUNE 27, 2023

9:00 – 12:00
T: Advanced training: augmentation and dropout
PW: Segmentation with augmentation

13:00 – 16:00
T: Transfer learning, pre-trained architectures
PW: Transfer Learning with Deep Neural

DAY 6 - JUNE 28, 2023

9:00 – 12:00
T: Dimension reduction and visualisation
PW: Eigenfaces

13:00 – 16:00
T: Stacked, sparse and denoising autoencoders
PW: Representation learning

LECTURER PROFILES

PROF. DR. MANFRED STROHRMANN (DAY 1-3)

Professor at the Karlsruhe University of Applied Sciences. Lectures in the Bachelor and Master programs at the Faculty of Electrical Engineering and Information Technology.

Fields of expertise:

- Systems theory
- Signal Processing
- Design For Six Sigma

Work Experience:

Researcher at Forschungszentrum Karlsruhe, developer and product owner at Robert Bosch GmbH. Developer and trainer of statistical methods of Design for Six Sigma.

DR. THOMAS LAMPERT (DAY 4-6)

Chair of Data Science and Artificial Intelligence at Télécom Physique Strasbourg and ICube research laboratory, University of Strasbourg.

Fields of expertise:

- Deep Learning
- Representation learning and clustering
- Unsupervised approaches
- Domain adaptation
- Medical imaging and remote sensing

Work experience:

Alumnus of the University of York and the U.S. Department of State's International Visitor Leadership Program. Different positions in industry and academia, among others with QinetiQ Ltd. and the UK Ministry of Defence.