

## Potential Topics for Student Projects and Theses

at our Faculty „Ingenieur- und Wirtschaftswissenschaften“, Fachhochschule Südwestfalen, Meschede, Germany

### Data Science Lab of Prof. Dr. Thomas Kopinski<sup>1</sup>:

- (1) Developing a Chat Bot for Product Recommendation  
(Programming/Python, NLP, Machine Learning)
- (2) Predictive Analysis of exhaust fume data for maintenance  
(Python, Data Science, Machine Learning)
- (3) Developing a Hand Gesture Recognition Demonstrator based on Time-of-Flight Data  
(C/C++, Machine Learning, Computer Vision)
- (4) Data Mining for Market Research: Developing a Classification Tool for Document Analysis  
(Programming/Python, NLP, Machine Learning)
- (5) Correlation Analysis of Time Series Data for Business Climate Prediction  
(Programming/Python, Data Science, Machine Learning)
- (6) Analysis and Clustering of Customer Data for Product Recommendation  
(Programming/Python, Data Science, Machine Learning)
- (7) Data Science and Tensorflow: Setting up a Framework for Big Data Analysis of the English Media Landscape  
(Programming, Python, Spark/Hadoop, Tensorflow, Machine Learning)

### Sensor Lab of Prof. Dr. Christian Kutzera:

- (8) Construction of a Laser Scanner to make beams visible as a “show model”
- (9) Image Processing using a Camera (PixyCam) and a Raspberry Pi on a RC car
- (10) Mechanical and Electrical Integration of Ultrasonic Sensors and designing Object Detection on a Raspberry Pi on an RC car
- (11) Mechanical and Electrical Integration of a Lidar Scanner and designing Object Detection and a Raspberry Pi on an RC car
- (12) Design of a Function and a Control System for Lane Keeping
- (13) Design of a Function and a Control System for Adaptive Cruise Control
- (14) Design of a Control System for Self Parking Function

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<sup>1</sup> Text in brackets denotes competences that the project will build on - these need to be available to a reasonable extent prior to project start. Details to be discussed with the Prof.

(15) More topics, to be proposed by students.

Goal is a self-driving RC car (1:10 or 1:5) using LIDAR Scanner, Ultrasonic, Camera and a Raspberry Pi. e.g. integration of vehicle show lights etc.

### **Communications Lab of Prof. Dr. Martin Botteck**

(16) Hierarchical Stream Coding of Energy Measurement Data

(17) Construction of a Test Platform for Energy Measurement Data Streams

(18) Adjustable Data Encryption Methods for Energy Data

(19) Extension of existing Lab Experiments on Industrial Communication and Automation

(20) Evaluation of Energy Measurement Data for Machine Characterisation

(21) A similar topic to be proposed by the student - depending on pre-knowledge and interest.