Development of an AI-based calibration algorithm
Dependable Systems - Dirk Nowotka

Project Description
The data and questions of this thesis are provided by the ZEUTEC Opto-Elektronik GmbH.

Company
ZEUTEC develops and produces spectrometer systems for animal and human food analysis. The devices of the SpectraAlyzer series are used for the fast routine analysis of the most common organic parameters (e.g. protein, fat, moisture content). All instruments are developed and produced in Germany and distributed worldwide.

Motivation
As secondary measuring instruments, the spectrometers must always be calibrated for the corresponding application (product). For this purpose, ZEUTEC classically use PLS and/or MLR algorithms. Recently, it has become apparent that some suppliers are increasingly dealing with AI algorithms. Therefore, ZEUTEC is advertising the following task as a bachelor’s or master’s thesis for the next possible date: Chemometric calibration development using existing sample spectra with the aid of modern AI algorithms.

Task of Thesis
Based on existing spectral data (optical spectrum of a sample with the corresponding reference values such as fat, moisture, protein), you will try to develop a prediction of the sample parameters with the help of AI algorithms. Your aim is to compare classical calibration (PLS/MLR) with AI calibration. For this purpose, ZEUTEC can provide data for different products. For each classical calibration there are statistical characteristics that can be used as a benchmark for an alternative AI calibration. Further information about ZEUTEC and their existing products can be found at https://www.spectraalyzer.com

Applicable For
- Bachelorstudents
- Masterstudents

Skillset
- Programming
- Machine Learning

Keywords
- Machine Learning
- Regression
- Feature Engineering

Contact
Karolina Ochs
@ kao@informatik.uni-kiel.de