Module 1. Introduction to Prescriptive Modelling

Parcel routing, optimization of production, investment decision – these are just some small examples, where optimization via prescriptive modeling is used. You are going to study, how optimization is used for the decision support, and what is the role of data in decision analytics. In the assignment you will get a hands-on experience with linear programming using one of the most popular solvers – Gurobi.

Module 2. Predictive Tools for Healthcare Analytics

Still thinking to apply decision tree or logistic regression to predict custom churn or hotel/flight cancellation? Do you know that such cases are categorized as time-to-event problem? In this module, we will introduce popular predictive tools for time-to-event analysis. We will learn basic theoretical knowledge, see how these tools could analyze survival rate of start-up company in our tutorial and get hand-on exercise on how to analyze Covid-19 patients in the assignment.

Module 3. Sports Analytics

In sports analytics, predictive analytics models are used to help decision makers (such as coaches and general managers) to gain a competitive advantage on the field of play. These models can be based on "traditional metrics" such as wins/losses, goals scored/allowed, or shots on goal. Additionally, modern tracking technologies can also be employed to gather event and location data for more detailed analysis of game dynamics and, e.g., consequences of tactical decisions. This module consists of a brief introduction to sports analytics and an assignment where the students use actual match data to build their own expected goals model for predicting scoring probabilities in football.

Module 4. Natural Language Processing in Financial Applications

The amount of textual data in the world is enormous. Text data can be a great source of valuable, real-time information that can't be captured by using only numeric types of data. In this module, you'll learn how to process and transform large quantities of text so that it can be used to extract valuable insight. Specifically, you will build machine learning models predicting sentiments from financial news articles. After this module, you will be able to add many new skills to your CV, such as NLP, sentiment analysis, text preprocessing & cleaning, and text feature representation.

Module 5. Introduction to Deep Learning with Neural Networks

Deep learning(DL) is one of state-of-the-art and trendy artificial intelligent methods! In this module you will learn the basis of DL and have a hand-on coding exercise with Pytorch. Does DL model have to have hundreds of layers and thousands of parameters? We will show you in our tutorial that DL could be a powerful alternative of conventional statistical method even with simple MLP layers. Stay with the trend and learn how to apply it creatively!

Module 6. Data Analysis Results Interpretation

World has come from the stage, when there was a shortage a data to the stage, when the amount of data is overwhelming. The correct usage of data has become a competitive advantage for many companies. In this module we are going to speak about different types of data, how people perceive it and what are the ways to deliver the necessary information to people. As an assignment for this task, a group case study will be offered. You will have to solve the case and present a solution and convince, that yours is the correct one.