SAV
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Schweizerische
Aktuarvereinigung
Association Suisse
des Actuaires
Associazione Svizzera
degli Attuari

Online Course „ Machine Learning with R for Actuaries"

Dates:
9.00 – 11.00, all Wednesday mornings May 2022

Overview:
Machine learning is getting a lot of attention due to significant achievements in the analysis of unstructured data (such as language processing, machine translation, image and audio recognition) and are widely used in consumer goods.

Machine learning models on structured tabular data, which is the data that actuaries mainly work with, are still used less frequently. This 8 hour online course will introduce the use of machine learning for tabular data usually present in insurance risk modelling.

The course is suited for all actuaries who are familiar with R and who like to get familiar with machine learning algorithm and apply them using R. The exercises are self-explained and will be performed by the participants after the blocks of the course on an individual basis.

Purpose and Nature:
The goal of this 4-block course is to introduce the participants into machine learning, starting with Generalized Linear Models (GLM). Second, the basic machine learning model selection and validation techniques are introduced. In the second part, tree-based methods and neural networks are discussed.

The course will be practical and consists of about 8 hours of presentations where the techniques are introduced and explained. The other 4-8 hours are exercises where the participants are using R/RStudio and the `keras` package to apply the concepts to publicly available data.

The content of the course is based on the material at https://github.com/mayer79/ml_lecture.

Prerequisites:
- Experience in basic R programming, i.e., familiar with `tidyverse`, `ggplot2` and the `base` package (you should already know how to fit a GLM in R).
- Participants will work on their laptops and are responsible for ensuring that all necessary packages listed on https://github.com/mayer79/ml_lecture are installed and work. Since installing `keras` uses Python as backend, it might be necessary to work on a private laptop.
- The course is restricted to members of the SAV.

Topics:
1. Basics and Linear Models
    a. Basics
    b. Linear regression
    c. Generalized Linear Model
2. Model Selection and Validation
3. Trees
    a. Decision trees
    b. Random forests
    c. Gradient boosting
4. Neural Nets

Language:
The language of the block course will be English.

Venue:
Online course.

Lecturer's CV:
Michael Mayer works as non-life pricing actuary at La Mobilière and holds a Ph.D. in Mathematical Statistics from the University of Bern (2008). Before he joined La Mobilière in 2018, he worked as bio-statistician at the Swiss Group for Clinical Cancer Research, pricing actuary at Allianz Suisse, statistics lecturer at University of Bern, and consultant at Consult AG Bern. Michael is member of the data science working group of the Swiss Association of Actuaries. He is lecturer of the CAS in Statistical Data Science at the University of Bern.

Course Fee and Registration:
- CHF 300.-
- Registration deadline: 17th April 2022
- Registration Link

Number of Participants:
Min: 10, Max: 30

CPDs:
For members of the SAV, 8 CPDs for the full course are provided. If the exercises are done, then up to 8 additional CPDs can be granted based on a self-declaration.

Coordination and Contact:
SAV Geschäftsstelle
Holger Walz (Geschäftsführer)
sekretariat@actuaries.ch

Programme:
Wednesday, 4th May 2022
    09.00 – 11.00   Basics and Linear Models

Wednesday, 11th May 2022
    09.00 – 11.00   Model Selection and Validation

Wednesday, 18th May 2022
    09.00 – 11.00   Trees

Wednesday, 25th May 2022
    09.00 – 11.00   Neural Nets

The exercises for every topic need to be done after the lecture hours listed above, requiring additional 4-8 hours.