UNIVERSITÄT LUZERN

Introduction to Machine Learning in R

Tutor	Dr Nicolas Attalides
Organization	Digital Skills, University of Lucerne
Language	English
ECTS-Points	
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Dates and time	Online Friday 10th May 2024 (Day 1) Saturday 11th May 2024 (Day 2) 9:30 – 16:30

Content	Machine Learning is an extremely popular topic within the field of Artificial Intelligence. We encounter the results of machine learning algorithms daily, for example, when we play online games or do online shopping to applying for an insurance or a loan. One way to define machine learning is the intersection between statistics and computer science. The R programming language is perfectly positioned to handle both fields. It offers a huge variety of statistical analysis solutions with over 20,000 packages which include a wide array of machine learning implementations. For example, one can apply a Boosting and Gradient Descent algorithm, build a Random Forest model, or design a Neural Network. This 2-day course focuses on introducing the participants to the main components of implementing machine learning in R. The course is structured to cover the following topics: • Get started with Machine Learning • Machine Learning and R • Explore and prepare the data • Design Machine Learning workflow • Classification problems • Model specification and data pre-processing • Machine Learning algorithms (Decision Trees, Random Forest, XGBoost) • Resampling and Tuning
Prerequisites/ Materials	Course participants are expected to have a good working knowledge of the R programming language. It is assumed that participants have some prior experience in basic data analysis (such as data manipulation and visualisation) and a basic understanding of statistics. No prior knowledge of machine learning theory is required. Participants should have their own laptop with R, RStudio and the relevant packages installed. Instructions for the technical setup will be circulated by the instructor before the course. Learning material such as slides, code and solutions to exercises will be circulated by the instructor after the course.
Teaching method	This course includes a range of activities such as model building demos, live-coding sessions, interactive quizzes, and practical exercises to work individually or in a group. Active participation and contribution are highly recommended.