UNIVERSITÄT LUZERN

Introduction to Machine Learning in R

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Organization	Digital Skills, University of Lucerne
Language	English
ECTS-Points	2
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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 "driving" a driver-less car. 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 16000 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 in the following main parts: • Prepare the data • Define the problem • Design machine learning workflow

	• Explore available algorithms • Explore R packages for machine learning • Cross-validation • Model fitting and hyper parameter tuning • Evaluate model performance
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. In case of technical issues, a backup RStudio server (accessed via web browser) will be available during the course, however using your own laptop is recommended as it allows you to apply and practise what you learn on your own setup. Learning material such as slides, documentation, code, exercises, cheat-sheets, and data will be circulated by the instructor. Participants can contact the instructor to communicate any special needs and/or requests: nicolas.attalides@gmail.com
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.