Faculty of Business Management and Economics

SUMMER MODULE COURSE

Title: Introduction to Machine Learning for Economists and Business Analysts		
Responsible:	**Target group**	**Number of participants**
Anthony Strittmatter	Bachelor Students	No limitation
Course period:	**Term:**	**ECTS:**
July 19-23	summer semester 2021	5

Contents & Objectives:

The course provides an introduction to machine learning methods. Supervised and unsupervised machine learning methods as well as reinforcement learning algorithms are covered. The focus of the lecture is on supervised machine learning methods, which include penalised regression methods, tree-based methods and neural networks. The unsupervised machine learning methods that are discussed include clustering and principal component analysis. Bandit algorithms are an example of reinforcement learning algorithms. The lectures are accompanied by coding sessions in which the machine learning methods are applied to real-life economic and business problems (using the open source software R).

Learning objectives / competences: 1) Students will be familiar with the principles of prediction. 2) Students will be able to distinguish between supervised and unsupervised machine learning methods. 3) Students will deploy machine learning methods to economic and business prediction problems. 4) Students will know how reinforcement learning algorithms can be used for decision-making.

Prerequisites: Statistics

Course Structure:

# day	**CONTENTS**
1	Penalized Regression (Lasso, Ridge, Elastic Net)
2	Tree and Random Forest
3	Neural Net
4	Unsupervised Machine Learning
5	Reinforcement Learning

Literature:

An Introduction to Statistical Learning with Applications in R (Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani). Download: http://www-bcf.usc.edu/~gareth/ISL/

Reinforcement Learning: An Introduction (Richard Sutton, Andrew Barto).
Download: https://web.stanford.edu/class/psych209/Readings/SuttonBartoIPRLBook2ndEd.pdf

Assessment:

Participation, home assignment

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Contact:
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Application:
○ transcript of records (regarding your current degree programme) ○ certificate of secondary school ○ short CV ○ copy of passport ○ application form (will be generated in the application process) **APPLY NOW:** https://flip.wiwi.uni-wuerzburg.de/module-study