Predictive Analytics for Production Systems

The increasing availability of data about customer behavior and operational processes calls for its systematic exploitation to improve decision-making in businesses. This course introduces descriptive and predictive Artificial Intelligence (AI) approaches for different Operations Management problems. In particular, machine learning approaches for supervised and unsupervised learning are introduced. For example, Neural Networks are presented to predict and optimize the performance of operations systems based on data. Applications in the areas of production management, maintenance, and yield prediction are discussed.

An introduction to the basics of programming with Python is provided. This is the basis for own applications and implementations of AI approaches by the students. Moreover, the students will leverage libraries of AI approaches. During the course, the students will work on several case studies and assignments (individually or in groups).

General Information*

Lecturer	Prof. Dr. Justus Arne Schwarz
Course Format	Lecture and exercise in the lab
Credit Points	6 ECTS
Language	English
Applicability	SPMG Industrial Management, SPMG Business Analytics and Operations Management, Electives Module
Exam	Individual assignments, group assignments, and final written exam (45 min)
Term	Winter term
Registration	Via SPUR by 17.10.2024

Learning Goals

- Students will be familiar with the fundamental concepts of different AI approaches.
- Students will learn how to select suitable AI techniques to obtain insights from big data sets of real-world problems to make business decisions supported by the data.
- Students will also develop programming skills that allow them to implement and apply AI approaches.
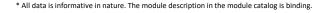
Prerequisites:

Recommended: Basic knowledge in operations management on Bachelor level (e.g. *Produktionsmanagement)*

Dates and Times

This course will be taught regularly in the winter term. In the winter term 2024/2025 at the following times:

Lecture: Monday 14:00 (c.t.) - 16:00, Room: H14
Exercise for the Python-experienced: Monday 16:00 (c.t.) - 18:00, Room: CIP-Pool (RWL U01 rechts) **OR**
Exercise for the Python beginners: Wednesday 10:00 (c.t.) - 12:00, Room: CIP-Pool (RWL U01 rechts)

* All data is informative in nature. The module description in the module catalog is binding.

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