EEMCS / Applied Mathematics

MATHEMATICS OF OPERATIONS RESEARCH

DEPARTMENT OF APPLIED MATHEMATICS

PROF. DR. MARIA VLASIOU







prof. dr. Richard Boucherie

prof. dr. Marc Uetz

prof. dr. Johannes Schmidt-Hieber



STOCHASTIC OPERATIONS RESEARCH

2 PROFESSORS, 1 ASSOCIATE PROFESSORS, 4 ASSISTANT PROFESSORS, 2 LECTURERS, 1 MANAGEMENT ASSISTANT, 12 PHD STUDENTS





RESEARCH – THEORY AND APPLICATIONS



Queuing Theory

Fluid Queues

Spatial Statistics and Stochastics

Information Theory

Transportation

Rare Event Simulation

Healthcare Logistics



Earthquakes, Fires, and Burglaries

Pandemic Preparedness

Markov Decision Theory

Control of Spatial Markov Decision Processes



Sequential Decision-Making

Multi-Agent Reinforcement Learning

Telecommunication Systems



Port Logistics



SELECTED PROJECTS AND LABS

- RAPIDE Regular and Unplanned Care Adaptive Dashboard for Cross-Border Emergencies (European Horizon)
- Improving regional patient admissions and inter-regional patient transfers during a pandemic (ZonMw)
- Ontzorgen in de VVT zorg (TKI Dinalog)
- Responsible scaling of data-driven approaches for enhancing mental health care (NWO-KIC)
- Supporting efficient deployment of nursing home staff through demand prediction (Pioneers in Healthcare)
- > 2 starter grants, one incentive grant
- Surviving Math (Innovate and Share it): Online escape game for new students
- > Richard Boucherie is chair of the Data Science and AI lab and the SME data lab









TEACHING

- LNMB, Dutch Network on the Mathematics of Operations Research: Markovian Queues and stochastic Networks (PhD course), Markov Decision Processes (PhD course), Queuing Theory (Mastermath)
- Applied Mathematics MSc: Information Theory and Statistics, Stochastic Processes, Measure and Probability, Applied Queueing Models, Reinforcement Learning, Game Theory, Spatial Statistics, Markov Decision Theory and Algorithmic Methods

> Applied Mathematics BSc:

- Module "Modeling and Analysis of Stochastic Processes" with the courses Markov Chains, Stochastic Models, Stochastic Simulation, Project on Healthcare Logistics
- Probability Theory
- Honours program: Complex Networks
- Many more courses taught in other programs
- Applied Mathematics Bachelor coordinator: Judith Timmer



Discrete Mathematics and Mathematical Programming Discrete Mathematics and Mathematical Programming



Broad Range of Research Areas





Modular Integrated Sustainable Datacenters (IPCEI)

And many more ...



- Díscrete Structures & Efficient Algorithms (BSc)
- Graph Theory (BSC)
- Optímízatíon ξ Learníng (BSc)
- Díscrete Optimization (MSc)
 - Game Theory (MSc)
- Mixed Integer Optimiztion (MSC)
- Scheduling (MSC)
- Límíts to Computing (MSC)
- Algorithms Beyond Worst Case (MSc)
- Complex Networks (MSC)
- Algorithmic Mechanism Design (PhD)
- Integer Programming Methods (PhD)

UNIVERSITEIT TWENTE

Statistics group

UNIVERSITY OF TWENTE



UNIVERSITY OF TWENTE.

Our Staff members



Johannes Schmidt-Hieber, Head of the group



Wouter Koolen, Full professor



Ashoke Sinha, Lecturer



Annika Betken, Assistant professor



katharina Proksch, Assistant professor



Rianne de Heide, Assistant professor



Sophie Langer, Associate professor



Our PhDs and Postdocs students



Our research

E-value analysis



Pure exploration



Theoretical foundations of **artifical** and **biological** neural networks And much more ...



Hypothesis testing



Time series analysis



Ongoing projects (jointly with our PhDs and PostDocs)



ERc: Biological inspired learning

- Biological neural networks
- zero-order methods



Accelerated learning

- Analysis of star-convex functions
- Best-arm identification problem



Veni project: Robust methods for time series analysis



Veni project: E-Values for Multiple Testing



Project Sports, Data & Interaction:

- Statistical multiscale analysis
- Sequential and multiple testing



Veni project: Deep learning in UN Image classification



Teaching

- Graphical models and causality (by Wouter Koolen)
- Mathematical Statistics 1 and 11 (by Katharina Proksch and Sophie Langer)
- Time Series Analysis (by Annika Betken)
- Statistics for IDE Students (by Katharina Proksch)
- Statistical Learning (by Rianne de Heide)
- Statistics and Probability Theory (by Ashoke Sinha)
- Introduction to Risk Theory (by Ashoke Sinha)

