



# Program

## Monday, September 25, 2023

Auditorium		Seminar room Z03.07/08	
13:30	<b>Welcome</b> Sven O. Krumke (RPTU), Anita Schöbel (Fraunhofer ITWM), Bernd Simeon (RPTU)		
13:40	<b>Plenary A.59 Reliable AI: Successes, Challenges, and Limitations<sup>1</sup></b> Gitta Kutyniok, Ludwig-Maximilians-Universität (LMU), Munich, DE (Chair: B. Simeon)		
14:30	<b>ANALYZING MATERIALS STRUCTURES: IMAGES, MACHINE LEARNING AND STOCHASTIC GEOMETRY</b> (Chair: C. Redenbach)	<b>MODELS AND DATA ACROSS SCALES AND DOMAINS IN ENGINEERING APPLICATIONS</b> (Chair: M. Burger)	
	<b>A.54 Random Tessellation Forests for High-dimensional Data (Track Plenary)<sup>1</sup></b> Eliza O'Reilly, Johns Hopkins University, US	<b>A.30 Dynamic Human Body Models in Vehicle Safety: An Overview (Track Plenary)<sup>1</sup></b> Jörg Fehr, University of Stuttgart, DE	
	<b>A.04 Large-scale statistical learning for mass transport prediction in porous materials using 90,000 artificially generated microstructures<sup>2</sup></b> Benedikt Prifling, Ulm University, DE	<b>A.15 Concurrent two-scale simulations in solid mechanics with Deep Material Networks<sup>2</sup></b> Matti Schneider, University Duisburg-Essen, DE	
	<b>A.53 A variational perspective on auxetic metamaterials of checkerboard-type<sup>2</sup></b> Dominik Engl, Catholic University of Eichstätt-Ingolstadt (KU), DE	<b>A.01 From Disruption to Success: Predictive Analytics in presence of Structural Changes in Energy systems<sup>2</sup></b> Milena Petkovic, Zuse Institute Berlin, DE	
16:00	Coffee break		
16:30	<b>MATHEMATICAL PROGRAMMING: UNCERTAIN DATA AND MULTIPLE OBJECTIVES</b> (Chair: S. Ruzika)	<b>RISK MANAGEMENT AND MACHINE LEARNING</b> (Chair: J. Wenzel)	
	<b>A.57 Recent Advances in Discrete and Robust Bilevel Optimization (Track Plenary)<sup>1</sup></b> Ivana Ljubic, ESSEC Business School, Paris, FR	<b>A.55 A stochastic gradient descent algorithm to maximize power utility of large credit portfolios under Marshall-Olkin dependence (Track Plenary)<sup>1</sup></b> Matthias Scherer, Technical University of Munich, DE	
	<b>A.10 A 3-stage adaptive algorithm for nonlinear robust optimization<sup>2</sup></b> Kerstin Schneider, Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, DE	<b>A.18 Active Learning of Surrogate Models for Inverse Problems<sup>2</sup></b> Martin Weiser, Zuse Institute Berlin, DE	
	<b>A.43 Adjustable Robust Optimization for Transport Planning with Uncertain Demands<sup>2</sup></b> Sabina Kiss, s2 data & algorithms, Graz, AT	<b>NEW Generating Financial Time Series with QuantGANs<sup>2</sup></b> Ralf Korn, University of Kaiserslautern-Landau, DE	
18:00	End of conference day 1		

## Tuesday, September 26, 2023

Auditorium		Seminar room Z03.07/08	
9:00	<b>Plenary A.60 Model Order Reduction at Industrial Scale<sup>1</sup></b> Peter Benner, Max Planck Institute for Dynamics of Complex Technical Systems, Magdeburg, DE (Chair: A. Schöbel)		
9:50	<b>MATHEMATICAL PROGRAMMING: UNCERTAIN DATA AND MULTIPLE OBJECTIVES</b> (Chair: M. Stiglmayr)	<b>RISK MANAGEMENT AND MACHINE LEARNING</b> (Chair: R. Korn)	
	<b>A.32 Applying Reverse Search Enumeration to Tri-Objective Linear Programming: A New Way to Parallelize Finding Extreme Points<sup>2</sup></b> Levin Nemesch, University of Kaiserslautern-Landau, DE	<b>A.40 Scenario generation for market risk models using generative neural networks<sup>2</sup></b> Solweig Flaig, Deutsche Rückversicherung AG, Düsseldorf, DE	
	<b>A.39 The Weighted p-Norm Weight Set Decomposition for Multiobjective Discrete Optimization Problems<sup>2</sup></b> Kathrin Prinz, University of Kaiserslautern-Landau, DE	<b>A.41 Calculating Expectiles and Range Value-at-Risk using Quantum Computers<sup>2</sup></b> Christian Laudagé, University of Kaiserslautern-Landau, DE	
	<b>A.37 Finite representation of quantile sets for multivariate data via vector linear programming<sup>2</sup></b> Andreas Löhne, Friedrich-Schiller-Universität, Jena, DE	<b>A.45 Risk Management in Portfolio Optimization: A Multicriteria Approach<sup>2</sup></b> Pascal Halffmann, Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, DE	
	<b>A.46 Generalized Dominance Cones for Ordinal Optimization<sup>2</sup></b> Michael Stiglmayr, University of Wuppertal, DE		
11:20	Coffee break		

11:40	<b>MATHEMATICAL PROGRAMMING: UNCERTAIN DATA AND MULTIPLE OBJECTIVES</b> (Chair: J. Schmid)	<b>ANALYZING MATERIALS STRUCTURES: IMAGES, MACHINE LEARNING AND STOCHASTIC GEOMETRY</b> (Chair: C. Fend)
	<b>A.07 Multicriteria Evaluation of Outsourcing Companies of Recycling and Waste Disposal<sup>2</sup></b> Nelson Hein, FURB – Universidade Regional de Blumenau, BR	<b>A.12 Connectivity in low porosity materials: quantification, stochastic geometry models, and relationships with material transport processes<sup>2</sup></b> Sandra Barman, RISE Research Institutes of Sweden, SE
	<b>A.29 Semi-infinite optimization algorithms for shape-constrained regression<sup>2</sup></b> Jochen Schmid, Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, DE	<b>A.05 Copula-based modeling and simulation of 3D systems of curved fibers by isolating intrinsic fiber properties and external effects<sup>2</sup></b> Matthias Weber, Ulm University, DE
	<b>A.33 The single row facility layout problem with chance constraints<sup>2</sup></b> Louisa Schroeder, TU Dortmund University, DE	<b>A.14 Microstructure analysis using geometric and topological data analysis<sup>2</sup></b> Yossi Bokor Bleile, Aalborg University, DK
	<b>A.08 DEMATEL Methodology in Evaluation of Green Supply Chain Management Practices<sup>2</sup></b> Adriana Kroenke, FURB – Universidade Regional de Blumenau, BR	<b>A.52 Classification of materials using Topological Data Analysis<sup>2</sup></b> Jan Felix Senge, Institute of Mathematics of the Polish Academy of Sciences, Warsaw, PL
13:10	Lunch break	
14:30	<b>MATHEMATICAL RESEARCH DATA</b> (Chair: M. Burger)	<b>SIMULATION AND OPTIMIZATION IN FLUID DYNAMICS</b> (Chair: R. Pinnau)
	<b>A.24 Workflows for structuring mathematical research data<sup>2</sup></b> Jochen Fiedler, Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, DE	<b>A.56 A second order level-set algorithm in topology optimisation and the topological state derivative (Track Plenary)<sup>1</sup></b> Kevin Sturm, TU Wien, AT
	<b>A.02 MaRDMO – An RDMO plugin to populate and query the MaRDI Knowledge Graph<sup>2</sup></b> Marcus Weber, Zuse Institute Berlin, DE	<b>A.06 Automated Solution of Shape Optimization Problems with cashocs<sup>2</sup></b> Sebastian Blauth, Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, DE
	<b>A.16 Documentation of Multi-X Modeling<sup>2</sup></b> Sibylle Hermann, University of Stuttgart, DE	<b>A.13 Identification of Reaction Kinetics Using Gradient-Based Optimization and Lattice Boltzmann Methods<sup>2</sup></b> Shota Ito, Karlsruhe Institute of Technology, DE
	<b>A.58 Ontological tools and interoperability for complex materials modelling applications<sup>2</sup></b> Peter Klein, Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, DE	
16:00	Coffee break	
16:20	<b>MODELS AND DATA ACROSS SCALES AND DOMAINS IN ENGINEERING APPLICATIONS</b> (Chair: J. Fehr)	<b>ANALYZING MATERIALS STRUCTURES: IMAGES, MACHINE LEARNING AND STOCHASTIC GEOMETRY</b> (Chair: K. Schladitz)
	<b>A.03 Physics-informed neural control of partial differential equations with applications to numerical homogenization<sup>2</sup></b> Denis Korolev, Weierstrass Institute for Applied Analysis and Stochastics (WIAS), Berlin, DE	<b>A.47 3D Microstructure Image Generation using GANs with Minkowski Functionals for Fuel Cell Electrodes<sup>2</sup></b> Abdelouahid Bentamou, Ecole des mines de Saint-Etienne, FR
	<b>A.48 Parameter Identification by Deep Learning of a Material Model for Granular Media<sup>2</sup></b> Derick Nganyu Tanyu, University of Bremen, Centre for Industrial Mathematics, DE	<b>A.28 Synthetic Data for Computer Vision in Surface Inspection<sup>2</sup></b> Natascha Jeziorski, University of Kaiserslautern-Landau, DE
	<b>A.20 Effects from large-scale employment of model-predictive control in district heating substations<sup>2</sup></b> Henrik Håkansson, Fraunhofer-Chalmers Centre, Gothenburg, SE	<b>A.49 A Fast Surrogate Model for the Monto-Carlo Simulation of Electron-Matter Interaction<sup>2</sup></b> Tim Dahmen, German Research Center for Artificial Intelligence (DFKI), Kaiserslautern, DE
	<b>A.09 An MPC-Based Motion-Cueing Algorithm for the Robot-Based Driving Simulator RODOS<sup>®2</sup></b> Tim Nicolai, Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, DE	<b>A.11 Segmenting cracks in CT images of concrete using scale invariant Riesz neural network<sup>2</sup></b> Baris Tin, Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, DE
		<b>A.44 Crack detection for 3D images of concrete using cumulative sum method<sup>2</sup></b> Duc Nguyen, Ulm University, DE
18:15	End of conference day 2	
18:30	Dinner, Atrium at Fraunhofer ITWM	

## Wednesday, September 27, 2023

	Auditorium	Seminar room Z03.07/08
9:00	<b>SIMULATION AND OPTIMIZATION IN FLUID DYNAMICS</b> (Chair: K. Sturm)	<b>MATHEMATICAL PROGRAMMING: UNCERTAIN DATA AND MULTIPLE OBJECTIVES</b> (Chair: T. Seidel)
	<b>A.21 Industrial melt spinning with two-way coupled air flow including crystallization and radial effects<sup>2</sup></b> Manuel Etmüller, Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, DE	<b>A.31 Inverse shortest paths in directed acyclic graphs<sup>2</sup></b> Orges Leka, University of Applied Sciences, Bingen, DE
	<b>A.23 AI-based workflow for predicting and optimizing the LDDC criterion in urban areas based on Computational Fluid Dynamics<sup>2</sup></b> Jennifer Werner, Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, DE	<b>A.34 Temporal Shortest Path Interdiction<sup>2</sup></b> Alina Wittmann, Technical University of Munich, DE
	<b>A.35 Microstructure Design and Additive Manufacturing of a Chromatography Column for the Separation of Biological Cells<sup>2</sup></b> Sonja Föhst, University of Kaiserslautern-Landau, DE	<b>A.27 Global solution of gemstone cutting problems using quadratic programming<sup>2</sup></b> Tobias Seidel, Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, DE
10:10	Coffee break	
10:30	<b>SIMULATION AND OPTIMIZATION IN FLUID DYNAMICS</b> (Chair: C. Leithäuser)	<b>JOINT SESSION: MODELS AND DATA ACROSS SCALES AND DOMAINS &amp; ANALYZING MATERIALS STRUCTURES</b> (Chair: K. Dreßler)
	<b>A.17 Reconstruction of inhomogeneous turbulence based on stochastic Fourier-type integrals<sup>2</sup></b> Nicole Marheineke, Trier University, DE	<b>A.25 Adaptively exploring the feature space of flowsheets<sup>2</sup></b> Michael Bortz, Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, DE
	<b>A.50 Positivity Preserving Time Integration Schemes for Balance Laws<sup>2</sup></b> Andreas Meister, University of Kassel, DE	<b>A.19 Gauss-Newton Method for ODE Optimal Control Problems<sup>2</sup></b> Vicky Holfeld, Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, DE
	<b>A.51 MESHFREE: a way to ensure reliability of industrial simulations in fluid and continuum mechanics.<sup>2</sup></b> Joerg Kuhnert, Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, DE	<b>A.26 Motion Estimation in Materials Science – A Mathematical Perspective to Shape and Accuracy of Calculated Displacement Fields.<sup>2</sup></b> Tessa Nogatz, University of Kaiserslautern-Landau, DE
11:45	<b>Plenary A.61 Optimization: four exciting decades of progress, and a look at what the future may hold<sup>1</sup></b> Robert E. Bixby, Rice University, Houston, Texas, US (Chair: K.-H. Küfer)	
12:35	Closing remarks	
12:45	Lunch, end of conference	