GAMM2025

Tuesday 8 April 2025

S25: Machine Learning and Data Science in Applied Mathematics and Mechanics: S25.01 - Room 1.22 (08:30 - 10:30)

-Conveners: Maximilian Penka; Martin Stoll

time	[id] title	presenter
08:30	[395] On uniqueness in structured model learning	MORINA, Erion
08:50	[396] Genetic column generation for adversarial multi-class classification	PENKA, Maximilian
09:10	[398] Kernel-based Greedy Approximation of Parametric Elliptic Boundary Value Problems	HAASDONK, Bernard
09:30	[399] Data analysis of architected structural geometries with persistent homology	MILOR, Abel Henri Guillaume
09:50	[400] Centralities in urban multilayer networks	STOLL, Martin
10:10	[401] Data-Driven Prediction of Dynamic Systems based on Sparse Reconstruction and Neural Networks	DU, Lin

S25: Machine Learning and Data Science in Applied Mathematics and Mechanics: S25.02 - Room 1.22 (16:30 - 18:30)

-Conveners: Nour Hachem; Marius Harnisch

time	[id] title	presenter
16:30	[362] A Neural Operator based Microscale Surrogate Model for Multiscale Simulations of Time Dependent Materials	JEYARAJ, Dhananjeyan
16:50	[364] Towards data-driven inelasticity for spatial problems: A neural network-based propagator approach	HARNISCH, Marius
17:10	[365] Deep learning for non-iterative generation of optimized finite element meshes	LEGELAND, Martin
17:30	[366] Mathematical and numerical analysis of the robustness of Data-Driven Identification (DDI) method	HACHEM, Nour
17:50	[367] Coupled CANN-DEM Simulation in Solid Mechanics	FRIEDRICH, Jonathan Georg
18:10	[368] Comparison of Generative Learning Methods for Turbulence Modeling	DRYGALA, Claudia

Wednesday 9 April 2025

S25: Machine Learning and Data Science in Applied Mathematics and Mechanics: S25.03 - Room 1.22 (08:30 - 10:10)

-Conveners: Hagen Holthusen; Karl A. Kalina

time	[id] title	presenter
08:30	[370] On the performance and convergence of PINNs for problems in linear elasticity	KADLAG, Dipraj
08:50	[371] Model discovery and challenges using inelastic Constitutive Artificial Neural Networks (iCANN s) at finite strains	HOLTHUSEN, Hagen
09:10	[372] Hard-constraining techniques and architectures in physics-informed neural networks for silicidation simulations	STRAUB, Christopher
09:30	[373] Anisotropic hyperelasticity meets physics-augmented neural networks	KALINA, Karl A.
09:50	[374] Application of Deep Learning Methods to Simulate the Behaviour of Soft Tissue Materials in Biomechanics	MUSTAFA, Agon

S25: Machine Learning and Data Science in Applied Mathematics and Mechanics: S25.04 - Room 1.22 (16:30 - 18:30)

-Conveners: Dirk Lorenz; Thomas Richter

time	[id] title	presenter
16:30	[375] Learning regularizers - bilevel opitimization or unrolling?	LORENZ, Dirk
16:50	[376] Time-adaptive SympNets for separable Hamiltonian systems	JANIK, Konrad
17:10	[377] Sparse full-order model inference for incompressible fluid dynamics	YILDIZ, Süleyman
17:30	[379] Investigation of hydrogel structure parameters in the Flory-Rehner model with data-driven approaches	WANG, Yawen
17:50	[380] Optimal data selection for learning differential equations	GOVOEYI, Medard
18:10	[381] An Adaptive Random Fourier Features approach applied to learning Stochastic Differential Equations	KAMMONEN, Aku

Thursday 10 April 2025

S25: Machine Learning and Data Science in Applied Mathematics and Mechanics: S25.05 - Room 1.22 (08:30 - 10:30)

-Conveners: Lena Dyckhoff; Benjamin Klusemann

time	[id] title	presenter
08:30	[382] A spatiotemporal deep learning framework for prediction of crack dynamics in heterogeneous solids: efficient mapping of concrete microstructures to its fracture properties	NAJAFI, Rasoul
08:50	[384] A baseline study on the potential of combining Machine Learning and dynamic substructuring	HAYN, Annika
09:10	[385] Physics-Informed Recurrent Neural Networks for Predicting Elasto-Plastic Behavior in Hierarchical Finite Element Modeling	DYCKHOFF, Lena
09:30	[408] Denoising Diffusion Model with Pixel Adaptive Convolutions for Sheet Metal Forming Analysis	ALI, Syed Sarim
09:50	[409] Hybrid modeling via machine learning corrections of friction surfacing process simulations towards experimental measurements	KLUSEMANN, Benjamin
10:10	[410] Hybrid finite element/neural network solver	KAPUSTSIN, Uladzislau

S25: Machine Learning and Data Science in Applied Mathematics and Mechanics: S25.06 - Room 1.22 (14:00 - 16:00)

-Conveners: Valentin Würz; Orkun Furat

time	[id] title	presenter
14:00	[411] Machine Learning and Stochastic 3D Modeling for Reconstructing 3D Grain Maps from 2D EBSD Data	FURAT, Orkun
14:20	[413] Comparison of classical ANN architecture and neural operator approach to approximate 2-point probability functions	SCHMOLLACK, Luzie
14:40	[414] Data-efficient inverse design of elastic spinodoid metamaterials	ROSENKRANZ, Max
15:00	[415] A Variational Autoencoder Approach to Structure-Property Mapping in Porous Metamaterials	HEIDER, Yousef
15:20	[416] A holistic AI approach from model creation to model evaluation in engineering applications	DRIESCHNER, Martin
15:40	[418] Inverse Material Design using Deep Reinforcement Learning and Homogenization	WÜRZ, Valentin

S25: Machine Learning and Data Science in Applied Mathematics and Mechanics: S25.07 - Room 1.22 (16:30 - 18:30)

-Conveners: Patrick Kurzeja; Max Rosenkranz

time	[id] title	presenter
16:30	[419] Neural networks for isotropic polyconvex hyperelastic energies, Part 1: Analysis of existing approaches and improved networks	KURZEJA, Patrick
16:50	[420] Neural networks for isotropic polyconvex hyperelastic energies, Part 2: A convex neural network framework with universal approximation capability	GEUKEN, Gian-Luca
17:10	[421] Multiscale Modelling through Physics-constrained Voigt-Reuss networks	KESHAV, Sanath
17:30	[424] VENI, VINDy, VICI: A Generative Approach to Reduced-Order Modeling with Embedded Uncertainty Quantification	KNEIFL, Jonas

17:50	[425] Certification of physics-informed neural networks for the solution of partial differential equations	ERNST, Lewin

Friday 11 April 2025

S25: Machine Learning and Data Science in Applied Mathematics and Mechanics: S25.08 - Room 1.22 (08:30 - 10:30)

-Conveners: Agnieszka Ozga; Qi Wang

time	[id] title	presenter
08:30	[426] Convergence and Implicit Bias: Analyzing Diagonal Linear Networks with Gradient Descent	BARTOLOMAEUS, Wiebke
08:50	[427] A multilevel proximal trust-region method for nonsmooth optimization with applications to scientific machine learning	WANG, Qi
09:10	[428] Challenges and opportunities of the German Transplant Register using computer models and artificial intelligence	SCHNURPEL, Anton
09:30	[429] Convergence of gradient based training for linear Graph Neural Networks	PATEL, Dhiraj
09:50	[431] Autoregressive and Generative Learning of Time Dynamics in Ergodic Systems	ROSS, Edmund
10:10	[432] Application range of a mathematical model computing distributions of random impulse excitations	FRANKOWSKA, Natalia SULEWSKI, Marek