SARTHAK KAPOOR

PERSONAL INFORMATION

Address:	Kullenhofstr. 56, Aachen 52074, Germany
Email:	sarthak.kapoor@rwth-aachen.de
Contact:	+49 162 5483728
Languages:	English and Hindi (Bilingual proficiency)
	German (A1)
Date of birth:	Nov. 1, 1997
Nationality:	India
Personal Website:	https://ka-sarthak.github.io/

EDUCATION

RWTH Aachen University *2020.10 - Present*
MSc Simulation Sciences
Focus: Applied mathematics, machine learning, computational modeling

Machine Learning Summer School (MLSS^N) *2022.06*
Hosted by Jagiellonian University, Poland
Participated with a full scholarship

National Institute of Technology, Warangal *2016.08 - 2020.08*
BTech Metallurgical and Materials Engineering
CGPA: 9.13/10.0 *(Gold Medalist)*

WORK EXPERIENCE

Machine Learning Developer Intern *2022.12 - Present*
Ericsson, Aachen

Wissenschaftliche Hilfskraft *2021.05 - 2022.11*
Material Mechanics, RWTH Aachen
Developed machine-learning-based surrogate models for micromechanics simulations.
Generative modeling using GANs, U-Net, FNO, and CNNs. (Python with TensorFlow, PyTorch libraries)

Application Development Analyst *2020.09 - 2020.12*
Accenture Technology Center, Bengaluru

COMMUNICATION

Kapoor, S., Mianroodi, J. R., Khorrami, M., Siboni, N. S., and Svendsen, B. (2022a). Comparison of two artificial neural networks trained for the surrogate modeling of stress in materially heterogeneous elastoplastic solids. https://arxiv.org/abs/2210.16994

Kapoor, S., Mianroodi, J. R., Svendsen, B., Khorrami, M., and Siboni, N. (2022c). Surrogate modeling of stress fields in periodic polycrystalline microstructures using U-Net and Fourier neural operators. In *NeurIPS 2022 AI for Science: Progress and Promises*

Kapoor, S., Mianroodi, J. R., and Svendsen, B. (2022b). Correlative modeling of microstructure and stress in solid mechanics using Machine Learning. In *MLSS 2022 Poster Session, Jagiellonian University, Poland*

Côté, R., Azzouni, M., Ghanmi, O., **Kapoor**, S., and Demers, V. (2021). Impact of rheological model on numerical simulation of low-pressure powder injection moulding. *Powder Metallurgy*, 64(1):8–16

SKILLS

Development —Python (TensorFlow, PyTorch, NumPy, SciPy, JAX, Scikit-Learn, Pandas), C/C++, MATLAB, Java, OpenMP, MPI, DCO, HTML, Javascript, MySQL, LaTeX, GitHub.

Pursuits —Machine Learning (Deep Learning, Neural Networks, Neural Operators, Computer Vision, Data Analytics), Phase-field modeling, Continuum modeling, Automatic Differentiation, Parallel Computing, Fast Iterative Solvers

PROJECTS

Phase field modeling of chemomechanical binary system *2022.04 - 2022.08*
Material Mechanics, RWTH Aachen
Implemented Cahn-Hilliard and Allen-Cahn models to simulate precipitate growth dynamics under the influence of chemical and mechanical energies. (Python)

Detecting gravity waves in atmospheric temperature data *2022.06* (excursion week)
Applied and Computational Mathematics, RWTH Aachen
Developed a low time-complexity algorithm to detect gravity wave events for reliable weather predictions. Supervised by Dr. Joern Ungermann from FZ Jülich. (Python with NumPy, SciPy, and JAX libraries)

Tracking local optima in dynamic systems *2021.10 - 2022.02*
Software and Tools for Computational Engineering, RWTH Aachen
Developed local-optima-tracking software for dynamic time-dependent functions. Supervised by Prof. Uwe Naumann. (C++ with dco/c++ library)

Fast iterative solvers for linear systems *2021.04 - 2021.09*
AICES, RWTH Aachen
Implemented multigrid solvers, Krylov-based linear system solvers (GMRES and CG) and eigensolver algorithms (Lanczos and Power Iteration) for huge sparse matrices taken from MatrixMarket. (Python)

Simulation of mold filling in LPIM (MITACS Scholar) *2019.05 - 2019.08*
Département de génie mécanique, ETS Montreal
Worked in modeling of injection stage in low-pressure metallic-powder injection molding using FEM simulations and experimentation. Supervised by Prof. Vincent Demers. (Moldflow, AutoCAD, MATLAB)

Phase field modeling of ternary system *2018.11 - 2019.04*
Metallurgical and Materials Engineering, NIT Warangal
Developed a semi-implicit spectral PFM routine to study the growth kinetics of precipitates in a hypothetical ternary system. (C with FFT library)

AWARDS

Recipient of a full scholarship to attend Machine Learning Summer School 2022

Recipient of Late Pendyala Upendra Gold Medal 2020 for academic excellence in BTech degree

Honored by Indian Institute of Metals, Hyderabad chapter, for academic excellence in BTech degree

Recipient of MITACS 2019 scholarship to pursue research at ETS Montreal

Recipient of NIT Warangal Merit Scholarship 2016, 2017, 2018, 2019 (Full Tuition Award)

Recipient of the prestigious OPJEMS award for two consecutive years 2018, 2019

VOLUNTEERING

Project Aakaar: Making geometry accessible to visually impaired
What started as a bachelor's project at the maker space of NIT Warangal, Project Aakaar has expanded into a global network of designers, thinkers, managers, and engineers, with the common goal of making technical education accessible in the special schools of developing countries. In collaboration with Dr. Kyle Keane (MIT).