SARTHAK KAPOOR

PERSONAL INFORMATION

Address:	Kullenhofstr. 56, Aachen 52074, Germany
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Languages:	English and Hindi (Bilingual proficiency)
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

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

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

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, 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*

Aachen Institute for Advanced Study in Computational Engineering Science, 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)

SKILLS

Development —C/C++, Python (TensorFlow, PyTorch, NumPy, SciPy, JAX, Scikit-Learn, Pandas), 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

COMMUNICATION

Poster presented at MLSS 2022 —"Correlative modeling of microstructure and stress in solid mechanics using Machine Learning"

Published article —Raphaël Côté, Mohamed Azzouni, Oussema Ghanmi, Sarthak Kapoor, and Vincent Demers. "Impact of rheological model on numerical simulation of low-pressure powder injection moulding". In: *Powder Metallurgy* 64.1 (2021), pp. 8–16

VOLUNTEERING

Project Aakaar: Making geometry accessible to visually impaired *2019.01 - Present*

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).

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

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