ARNAB MUKHERJEE

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SKILLS

Programming	Python, C++, Matlab, Data Analysis (Scikit-Learn, PyTorch, SkImage), Linux-Bash
Technical	Docker, Flask, Machine & Deep Learning, LLM, ANN-RNN-CNN, MlFlow, Computer Vision
Languages	English (Fluent), German (B1)

EXPERIENCE

Wissenschaftliche Hilfskraft (WHK) — ZeHS, TU Bergakademie Freiberg, Germany Jun 2024 - Present

- Conducted **Scanning Acoustic Microscopy** (SAM) to detect material defects and voids
- Enhanced defect detection with SAFT analysis and Python-based **image processing** techniques
- Developed automated defect classification models using **deep learning architectures**

Software Engineer — Larsen & Toubro Infotech Mindtree (LTIM), India Jul 2022 - Sep 2023

- Improved individual insurance systems for client companies, enhancing customer experience
- Managed test metrics, risk logs, and delivered reports for high-value energy domain accounts
- Drove a USD 5M revenue increase through strategic planning and client engagement

EDUCATION

Master's in Computational Material Science, TU Bergakademie Freiberg, Germany 2023 - Present
Relevant Coursework: Scientific Computing, High Performance Computing, Math for ML, Materials Mechanics, Simulation of Microstructures, Nonlinear FEA, Plasticity

PROJECTS & PUBLICATIONS

Chemical Mechanism Reduction Framework — Python, Genetic Algorithms, Machine Learning
Developed a framework combining genetic algorithms and machine learning to optimize methane combustion mechanisms using Cantera, achieving significant computational reductions while maintaining accuracy.

Transformer-Based Language Model Implementation — PyTorch, Deep Learning
Built a decoder-only GPT model based on the "**Attention is all you need**" architecture, utilizing self-attention mechanisms, positional encoding, and transformer blocks for NLP tasks.

Medical Image Classification Pipeline — PyTorch, MlFlow, DVC
Engineered an end-to-end disease classification system using transfer learning with VGG16 CNN. Integrated MLOps practices such as MlFlow for experiment tracking and DVC for data version control, and deployed on Koyeb.

Publications:

- *Low-Velocity Impact Damage on Gas Turbine Blades*, Journal of The Institution of Engineers (India) Link
- *3D-printed Composite Sensors: Advancements, Opportunities, and Prospects*, Springer. Link
- *Mechanical Properties of Aluminium Metal Matrix Composites*, Springer. Link

EXTRA-CURRICULAR ACTIVITIES

Campus Specialist - ORTE Career Fair 2023
Supported TU Bergakademie Freiberg's Career Center in organizing the ORTE Career Fair, increasing student participation by 30

Sand Rover - KSHITIJ 2020, IIT Kharagpur
Built an IoT-enabled sand rover using Arduino and participated in a robotics event at KSHITIJ 2020.