Huzaif Rahim

Quantitative Analyst – Physics PhD | Statistical Modeling | Data Analysis | Python

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Work Authorization: Fully eligible in Germany

PROFILE SUMMARY

PhD researcher with a strong foundation in physics and quantitative analysis. Expertise in statistical modeling, data-driven research, and numerical methods. Developed complex models, conducted large-scale simulations, and performed rigorous statistical analysis. Proficient in Python for data analysis and automation. Seeking to apply analytical rigor to quantitative finance.

EDUCATION

PhD Researcher – Computational Physics (2022–present; thesis submitted)
Institute for Multiscale Simulation, FAU Erlangen-Nürnberg, Germany

- **Dissertation:** Multiscale analysis of shear-induced surface deformation in granular materials composed of non-spherical particles.
- Developed high-fidelity numerical models using the Discrete Element Method (DEM) to analyze stability, transient response, and parameter sensitivities.
- Developed and executed large-scale parallel simulation codes in C++ and Python.
- Managed full-cycle simulation campaigns on HPC clusters, from design to execution.
- Built automated, scalable data processing pipelines for multi-terabyte simulation outputs.
- Conducted stability and sensitivity analyses to identify critical system parameters and validate model performance.

M.S. Physics (2016–2019), *University of Science and Technology of China, Hefei*

- **Thesis:** Analysis of Turing Patterns in Three-Component Reaction-Diffusion System
- **Supervisor:** Prof. Ding Zejun, **GPA:** 3.3/4.0

M.Sc. Physics (With Distinction) (2010–2013), *University of Peshawar, KP, Pakistan*

- **Project:** Theoretical Study of Reverse Compton Effect

B.Sc. (With Distinction) in Physics, Mathematics, Electronics, (2008–2010),
University of Peshawar, Pakistan

- Coursework: applied electronics, signal processing, network analysis, electronic communication.

Intensive German Integration Course (BAMF) (2025 – 2026), *bfz GmbH, Erlangen, Germany*

- Full-time language and orientation program

Chinese Language Certification (With Distinction), (2015–2016),
Anhui Normal University, Wuhu, PR China, Level: HSK4

Diploma in Computer Science (2006–2007),
Frontier College of Information Technology, Charsadda, KP, Pakistan

TECHNICAL SKILLS

Programming: Python (NumPy, SciPy), C++, Linux/Bash, Git
Data Analysis: Statistical analysis, time-series analysis, data processing pipelines
Numerical Methods: Numerical modeling, Monte Carlo methods, sensitivity/stability analysis, hypothesis testing, model validation
HPC: High-Performance Computing, parallel computing, large-scale simulations

SUPERVISION EXPERIENCE

Project Supervisor – Projektkurs CBPT/BPT, (2024), *FAU Erlangen-Nürnberg, Germany*

- Supervised Python-based automation pipeline for robotic arm pattern generation.
- Developed hardware-software integration documentation with safety protocols.

Seminar Supervisor – CEP Advanced Seminar, (2024) *FAU Erlangen-Nürnberg, Germany*

- Mentored students in literature review on Weissenberg effect in fluids.
- Focused on scientific comprehension, academic writing, and presentation skills.

WORK EXPERIENCE

GCSE Physics Teacher, (2019–2020), *IVY Hefei Experimental Academy High School, Anhui Hefei, China*

- Planned, prepared, delivered lessons; supervised students' lab work.

Lecturer in Physics, (2013–2015), *Mardan Model School and College, Mardan, KP, Pakistan*

- Planned, prepared, delivered lectures; supervised laboratory sessions.

PUBLICATIONS

- Rahim, H., Roy, S., Pöschel, T. (2026). Impact of Friction and Grain Shape on the Morphology of Sheared Granular Media. Physical Review Fluids, 2026. DOI: 10.1103/z1rz-b4j6
- Rahim, H., Angelidakis, V., Pöschel, T., Roy, S. (2024). Alignment-Induced Depression and Shear Thinning in Granular Matter of Nonspherical Particles. PR Fluids, DOI: 10.1103/PhysRevFluids.9.114304
- Rahim, H., Iqbal, N., Cong, C., Ding, Z.J. (2019). Pattern Selection in a Three-Component Gray-Scott Model. Journal of Physics: Conference Series. DOI: 10.1088/1742-6596/1324/1/012012
- Rahim, H., Roy, S., Pöschel, T. (2025). Shear-Induced Pressure Anisotropy in Granular Media. Submitted to PRE. DOI: arXiv:2512.11157
- Rahim, H., Pöschel, T., Roy, S. (2026). Dilatancy-induced surface deformation in cohesive granular media. Submitted to POF. DOI: arXiv.2601.01172
- Rahim, H., Cong, C., Ding, Z.J. Competition-Induced Resonant Annihilation of Turing Patterns. (To be submitted)

CERTIFICATES

- C++ Software Design – Erlangen National High Performance Computing (HPC) Center, FAU Germany
- Computers, Waves, Simulations: Numerical Methods Using Python – LMU / Coursera
- Supervised Machine Learning: Regression and Classification – DeepLearning.AI / Coursera
- Python Data Structures – University of Michigan / Coursera (Prof. Charles Severance)
- Numerical Methods for Engineers – HKUST / Coursera (Prof. Jeffrey Chasnov)
- Python for Data Science, AI & Development – IBM / Coursera
- Computational Physics: Scientific Programming with Python – Udemy
- C++ Professional Course & Python for Data Science – SoloLearn
- AI for Everyone – DeepLearning.AI / Coursera (Andrew Ng)
- Introduction to Project Management – IBM / Coursera

HONORS & AWARDS

Chinese Government Scholarship (2015–2019) | Silver Medalist, M.Sc. (2013) | Best Student Award, Anhui Normal University (2016)

MANAGERIAL EXPERIENCE

Safety Supervisor, Hefei National Lab (2016–2019) | Proctorial Board Member, University of Peshawar (2010–2013) | Conference Organizer (2011)

LANGUAGE SKILLS

English (Fluent) | German (B1, currently pursuing B2) | Chinese (HSK4) | Urdu (Native)

CONFERENCES & WORKSHOPS

- Poster Presentation: DEM-9 (Sep 2023), Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
- Society for Mathematical Biology Annual Meeting (SMB- 2021), University of California, USA (Virtual)
- 2nd International Conference on Physics, Mathematics, and Statistics (ICPMS, May 2019), Hangzhou, China
- 4th International Workshop on Matter Out of Equilibrium (Sep – Nov, 2021), University of San Luis Potosí, Mexico (Online)

- Early Career Research in Biological Physics – Institute of Physics (IOP) (Dec 2021) Caledonian Road, London, UK
- Physics of Life Workshop: Periodic Patterns (Nov 2021) University of Oxford, UK (Virtual)
- Modelling Diffusive Systems: Theory & Biological Applications (MoDiS, Sep 2021) ICMS Early Career Researcher Workshop (Virtual)
- Institute of Mathematics and Its Applications (IMA May 2021), Zoom, UK
- Materials Processing, Characterization, and Properties (Mar 2013), Materials Research Laboratory (MRL), University of Peshawar, Pakistan
- National Conference on Material Science 2011, Materials Research Laboratory (MRL), University of Peshawar, Pakistan

REFERENCES

Prof. Thorsten Pöschel – Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

Dr. Vasileios Angelidakis – Queen's University Belfast, UK

Dr. Sudeshna Roy – Daiichi Sankyo Europe GmbH, Germany

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