Abhinav Mishra - CV

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Education

M.Sc. Bioinformatics, Freie Universität Berlin, Germany 2025
Thesis: Mathematical Optimization of Signalling Networks in Triple Negative Breast Cancer

B.Tech. Bioinformatics, Jaypee University of Information Technology, India 2017
Thesis: Identification of Potent Biomarkers for Prostate Cancer Through AR, MAPK, and mTOR Pathway Mining

Research Experience

Research Intern *Institute for Biology, Humboldt-Universität zu Berlin (König Lab)* Jan–Feb 2025

- Developed a physiologically based pharmacokinetic (PBPK) model of Tirzepatide from clinical data, formulating multi-compartment ODE systems for absorption, distribution, and clearance dynamics.
- Performed parameter optimization and model calibration against clinical time-course data, applying sensitivity analysis to assess identifiability and robustness.
- Automated workflows for reproducible model fitting and simulation in Python, integrated with existing pharmacokinetic frameworks.

Master Thesis Student *Theoretical Biophysics, Humboldt-Universität zu Berlin (Klipp-Linding Lab)* May 2024–Jan 2025

- Built a complete optimization framework for reconstructing phosphorylation signalling networks in triple-negative breast cancer from time-resolved kinase–substrate datasets.
- Designed and solved inverse problems using non-linear least-squares and constrained optimization, coupled with ODE-based dynamical models of phosphorylation.
- Conducted model validation, sensitivity analysis, and robustness checks; structured the framework as a modular Python package suitable for reuse and extension by other researchers.
- Investigated temporal data weighting schemes and their effect on parameter identifiability under uneven time sampling, integrating early-dynamics emphasis.

Bachelor Thesis Student *Jaypee University of Information Technology, India* Feb 2016–Mar 2017

- Implemented a biomarker discovery pipeline integrating GEO2R differential expression analysis, clustering in MeV, and R/Shiny visualization to explore AR/MAPK/mTOR pathways in prostate cancer.
- Identified potential biomarkers and network modules using pathway mining and statistical analysis.

Project Researcher *Jaypee University of Information Technology, India* Aug 2015–Mar 2016

- Designed a drug docking workflow combining Discovery Studio and Glide XP for virtual screening of small molecules against target proteins.
- Prepared structures, optimized docking protocols, and analyzed binding interactions to shortlist candidate compounds.

Conferences & Presentations

MATH+ Day Seminar, Berlin 2024
RECOMB 2020
R&D Expo IEEE–JUIT 2016
NSCSB 2016

Awards & Honours

3rd Prize (Poster), NSCSB, JUIT India 2016
GATE Qualified, AIR 681 2018

Languages

English (native), Hindi (native), German (Basic)

Career Breaks

Family reasons and illness (recurrent pilonidal sinus) 2018–2020
Bachelor entrance exams preparation 2012–2013