Mahasweta Bhattacharya

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Education

University at Buffalo, State University of New York — Buffalo, NY
Doctor of Philosophy in Biomedical Engineering — *Aug. 2017 – Jan 2023*

University at Buffalo, State University of New York — Buffalo, NY
Master of Science in Electrical Engineering — *Aug. 2015 – May 2017*

West Bengal University of Technology — Kolkata, India
Bachelor of Technology in Electronics and Communication Engineering — *Aug. 2010 – May 2014*

Experience

Senior Scientist — Sept. 2023 – Present
Sanofi — *Cambridge, MA*

- Led the design of an agentic-AI pipeline orchestrating Claude-based agents to autonomously aggregate and summarize multimodal biological evidence for target credentialing; delivered scalable plain-language evidence reports, reduced manual review overhead by **>50%**, and operationalized LLM-driven reasoning in a regulated scientific workflow.
- Designed a multi-modal foundation model integrating genetics, transcriptomics, and clinical embeddings; achieved **4× improvement in causal target recall** over genetics-only baselines and established a transferable representation space for cross-disease generalization.
- Led transcriptomic pharmacodynamics modeling to compare oral vs injectable therapies for Hidradenitis Suppurativa; identified **superior immune-pathway perturbation** for the oral candidate, enabling preclinical advancement and establishing a robust MoA modeling workflow.
- Developed a harmonized meta-analysis pipeline for public HS transcriptomes, producing a **mechanistic target-ranking framework** presented at FOCIS 2025 and forming the computational backbone for patient stratification and network modeling.
- Founded a graph-based bispecific discovery platform integrating synergy metrics, biological embeddings, and **LLM-guided evidence retrieval**; generated **5 novel bispecific target-pair candidates**.
- Built a scalable disease-mapping and indication-discovery engine scoring **232 immune indications in 3 weeks** and scaling to **17,000+ phenotypes**, enabling computational repurposing and whitespace identification.
- Developed an explainable AI-driven target-discovery engine generating **90+ hypotheses** and advancing **7 novel targets** into preclinical evaluation; incorporated causal scoring, embedding similarity, and LLM-augmented evidence synthesis.
- Co-led an automated multimodal target-credentialing platform supporting **30+ therapeutic programs** and enabling **3 preclinical nominations**; introduced modules for causal inference, uncertainty quantification, and prospective validation.

Information Technology Support Specialist — Sep. 2018 – Present
Southwestern University — *Georgetown, TX*

- Communicate with managers to set up campus computers used on campus
- Assess and troubleshoot computer problems brought by students, faculty and staff
- Maintain upkeep of computers, classroom equipment, and 200 printers across campus

Artificial Intelligence Research Assistant — May 2019 – July 2019
Southwestern University — *Georgetown, TX*

- Explored methods to generate video game dungeons based off of *The Legend of Zelda*
- Developed a game in Java to test the generated dungeons
- Contributed 50K+ lines of code to an established codebase via Git
- Conducted a human subject study to determine which video game dungeon generation technique is enjoyable
- Wrote an 8-page paper and gave multiple presentations on-campus
- Presented virtually to the World Conference on Computational Intelligence

Projects

Gitlytics | *Python, Flask, React, PostgreSQL, Docker* — June 2020 – Present

- Developed a full-stack web application using with Flask serving a REST API with React as the frontend
- Implemented GitHub OAuth to get data from user's repositories
- Visualized GitHub data to show collaboration
- Used Celery and Redis for asynchronous tasks

Simple Paintball | *Spigot API, Java, Maven, TravisCI, Git* — May 2018 – May 2020

- Developed a Minecraft server plugin to entertain kids during free time for a previous job
- Published plugin to websites gaining 2K+ downloads and an average 4.5/5-star review
- Implemented continuous delivery using TravisCI to build the plugin upon new a release
- Collaborated with Minecraft server administrators to suggest features and get feedback about the plugin

Technical Skills

Languages: Java, Python, C/C++, SQL (Postgres), JavaScript, HTML/CSS, R
Frameworks: React, Node.js, Flask, JUnit, WordPress, Material-UI, FastAPI
Developer Tools: Git, Docker, TravisCI, Google Cloud Platform, VS Code, Visual Studio, PyCharm, IntelliJ, Eclipse
Libraries: pandas, NumPy, Matplotlib