Sayali A. Alatkar

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Education

University of Wisconsin-Madison, Madison, Wisconsin USA

- Ph.D. in Computer Science, Summer 2025 (anticipated)
- Interests: machine learning for single-cell genomics, multi-modal integration and imputation, optimal transport, graph neural networks, brain disorders, generative AI
- Committee: Daifeng Wang (advisor), Fred Sala, Yudong Chen, André Sousa, Panos Roussos

Stony Brook University, Stony Brook, New York USA

- M.S. in Computer Science, May, 2020 (G.P.A. - 3.6/4)
- Master's Thesis: Detecting Smart Home Activity through Network Traffic Signatures.
- Committee: Samir Das (advisor), Amir Rahmati, Michalis Polychronakis, Vasudevan Nagendra

University of Pune, Pune, India

B.E. in Computer Engineering, May, 2018 (G.P.A. - 3.7/4)

Publications

Submitted/under-review

1. NeuroTD: A Time-Frequency Based Multimodal Learning Approach to Analyze Time Delays in Neural Activities, *submitted*, 2024, link code
   Xiang Huang, Noah Cohen Kalafut, **Sayali Alatkar**, Athan Z. Li, Qiping Dong, Qiang Chang, Daifeng Wang

Peer-reviewed/conference papers

1. Personalized Single-cell Transcriptomics Reveals Molecular Diversity in Alzheimer's Disease, *in revision*, Nature Medicine, 2025, link code
   Pramod Bharadwaj Chandrashekar*, **Sayali Anil Alatkar***, Noah Cohen Kalafut*, Ting Jin*, Chirag Gupta, Ryan Burzak, Xiang Huang, Shuang Liu, Athan Z. Li, PsychAD Consortium, Kiran Girdhar, Georgios Voloudakis, Gabriel E. Hoffman, Jaroslav Bendl, John F. Fullard, Donghoon Lee, Panos Roussos#, Daifeng Wang#,
2. ARTEMIS integrates autoencoders and Schrödinger Bridges to predict continuous dynamics of gene expression, cell population and perturbation from time-series single-cell data, ISMB/ECCB 2025, link code
   Sayali Anil Alatkar, Daifeng Wang,
3. CMOT: Cross-Modality Optimal Transport for multimodal inference, *Genome Biology*, 24, 163, 2023,link code
   Sayali Anil Alatkar, Daifeng Wang,
4. DeepGAMI: Deep biologically guided auxiliary learning for multimodal integration and imputation to improve phenotype prediction, *Genome Medicine* 15, 88, 2023,link code
   Pramod Bharadwaj Chandrashekar, **Sayali Alatkar**, Jiebiao Wang, Gabriel E. Hoffman, Chenfeng He, Ting Jin, Saniya Khullar, Jaroslav Bendl, John F. Fullard, Panagiotis Roussos, Daifeng Wang,
5. Single-cell network biology characterizes cell-type gene regulation for drug repurposing and phenotype prediction in Alzheimer's disease, *PLoS Computational Biology*, 18(7): e1010287, 2022
   Chirag Gupta, Jielin Xu, Ting Jin, Saniya Khullar, Xiaoyu Liu, **Sayali Alatkar**, Feixiong Cheng, Daifeng Wang, link

Professional Experience

UW-Madison, Madison, WI, USA
Research Assistant, Daifeng Wang Lab & Waisman Center **August, 2021 - present**

- Developing interpretable machine learning methods for single-cell genomics (e.g., scRNA-seq, scATAC-seq), spatial transcriptomics and genotype data
- Assisted on several NIH grant proposals

Siemens Corporate Research, Princeton, NY, USA
Research intern, Cybersecurity Research Group **May, 2019 - August, 2019**

- Implemented an OCR-based homoglyph detection tool from literature for domain service monitoring
- Implemented new features for Siemens threat news portal

Teaching Experience

UW-Madison, Madison, WI, USA
Teaching Assistant-Intro to Python **August, 2020 - May, 2021**

Posters/Talks

Posters

- Research in Computational Molecular Biology (RECOMB) '21
- International Conference on Intelligent Systems for Molecular Biology (ISMB) '22

Talks

- ISMB/European Conference on Computational Biology (ECCB) '25
- RECOMB/ISCB Conference on Regulatory & Systems Genomics with DREAM Challenges (RSG-DREAM) '23

Mentoring

- Abhinav Nandwani, *B.S. in Computer Engineering, UW-Madison* (Spring '25 - Present)
- Ryan Burczak, *M.S. in Biomedical Data Science, UW-Madison* (Spring '24 - Fall '24)

Honors and Awards

UW-Madison CS Summer Research Fellowship
Usenix Security'21 Diversity Grant
Accepted into NSF Sponsored GREPSEC (Workshop for Underrepresented Groups in Security and Privacy) V Workshop'21

Relevant Coursework

UW-Madison Graduate

- Machine Learning (Fred Sala)
- Mathematical Foundations of Machine Learning (Robert Nowak)
- Advanced Bioinformatics (Daifeng Wang)

Skills

- Languages: Python, R
- Packages (ordered by proficiency): PyTorch, PyTorch Geometric, JAX, DGL
- Applications: Visual Studio Code, Anaconda, RStudio, Cytoscape
- Operating Systems: Ubuntu, Windows