

Hammad Farooq

Bioinformatician/ Data Scientist

✉ hfaroo21@uic.edu

🌐 <https://www.linkedin.com/in/hammad-farooq-raja-0096>

Education

University of Illinois Chicago

Ph.D. in Bioinformatics

Expected December 2025

Chicago, IL, USA

- **Thesis title:** Computational predictions of 3D chromatin structures reveal the roles of chromatin hubs in gene expression.
- **Advisors:** Jie Liang, Constantinos Chronis

FAST National University of Computer and Emerging Sciences

Bachelor of Science in Computer Science

2014-2018

Islamabad, Pakistan

- **Final Year Project:** Predicting the pathogenicity of protein-coding mutations using Natural Language Processing.

Technical Skills

Programming: Python, R, C++, SQL, Java, Bash and Perl Scripting, C#, MATLAB, GO.

Genomic Data Analysis: Hi-C, ChIP-seq, RNA-seq, ATAC-seq.

Machine Learning, Deep Learning, and Natural Language Processing: ML (regression, classification, clustering), DL (CNN, RNN, LSTM, GRU, Transformer, Autoencoders), NLP (NER, Sentiment Analysis, Classification, Word Embeddings, BERT.)

Bioinformatics Tools: HiCExplorer, HiC-Pro, Cooler, HiCNorm, Fit-Hi-C, Arrowhead, HiCCUPS, CHiCAGO, DESeq2, edgeR, Enrichr, Metascape, Bowtie, MACS2, BWA, Samtools, MEME Suite, JASPAR, HOMER.

High-Performance Computing (HPC): Parallel Computing (MPI, OpenMP, OpenACC), Job Scheduling Systems (Slurm's SBATCH, Portable Batch System, Argonne's COBALT Scheduler), CUDA, Intel® oneAPI.

Research & Professional Experience

Computational Biology University of Illinois Chicago

Research Assistant

Aug 2019 – Present

Chicago, IL, USA

- Conducted research on gene regulation and 3D chromatin architecture, with a focus on uncovering the functional impact of non-coding regulatory variants.

Computational Biology Research Lab at NUCES-FAST

Research Assistant

Aug 2018 – Aug 2019

Islamabad, Pakistan

- Contributed to projects in computational biology and machine learning, utilizing deep learning for histopathological image analysis and protein structure prediction, and performing pharmacovigilance analysis from social media data.

Automotive Artificial Intelligence

AI developer Intern

Jan 2018 – Feb 2018

Islamabad, Pakistan

- Contributed significantly to the design and implementation of an advanced AI-based Intrusion Detection System, showcasing expertise in cybersecurity and artificial intelligence.

ReVeAL (Recognition, Vision and Learning) Lab, NUCES-FAST

Machine Learning Intern

June 2017 – August 2017

Islamabad, Pakistan

- Contributed to the development of an AI-powered chatbot, focusing on natural language understanding.

Teaching Experience

FAST National University of Computer and Emerging Sciences

Teaching Assistant – Applied Programming

Fall 2018

Islamabad, Pakistan

- Designed and conducted hands-on C++ programming sessions for graduate students with non-CS backgrounds.
- Focused on foundational programming concepts and practical applications tailored for beginners in computer science.

FAST National University of Computer and Emerging Sciences

Lab Demonstrator – Computer Organization and Assembly Language

Fall 2016

Islamabad, Pakistan

- Led lab sessions and provided practical support for students learning computer architecture and assembly programming.
- Assisted students with low-level programming tasks, including instruction set simulation and register-level debugging.

Publications

Hammad Farooq, Lin Du, Pourya Delafrouz, Wei Jiang, Constantinos Chronis, and Jie Liang. "A New Approach for Discovering Functional Links Connecting Non-Coding Regulatory Variants to Gene Targets." *bioRxiv* (2024): 2024-06.

Lin Du, **Hammad Farooq**, Pourya Delafrouz, and Jie Liang. "Structural basis of differential gene expression at eQTLs loci from high-resolution ensemble models of 3D single-cell chromatin conformations." *Bioinformatics* 41.2 (2025): btaf050.

Pourya Delafrouz, **Hammad Farooq**, Lin Du, Ao Ma, and Jie Liang. "Effects of Lamina-Chromatin Attachment on Super Long-Range Chromatin Interactions." *bioRxiv* (2025): 2025-02.

Asia Owais, **Hammad Farooq**, Hannah Chen, Prisca K. Thami, Jaime DeSantiago, Talla Abbas, Arif Pavel, Bradley Merrill, James S. Ware, Siong Fu Siong Ng, and Dawood Darbar. "Gene-Gene Interactions Between a LMNA Variant and Common Polymorphisms Drive Early-Onset Atrial Fibrillation." *Manuscript under revision*.

Khalid H Bhat, Saurabh Priyadarshi, Sarah Naiyer, Xinyan Qu, **Hammad Farooq**, Eden Kleiman, Jeffery Xu et al. "An Igh distal enhancer modulates antigen receptor diversity by determining locus conformation." *Nature Communications* 14, no. 1 (2023): 1225.

Hammad Farooq, Junaid Suhail Niaz, Saira Fakhar, and Hammad Naveed. "Leveraging digital media data for pharmacovigilance." In *AMIA Annual Symposium Proceedings*, vol. 2020, p. 442. 2021.

Naeem Rehmat, **Hammad Farooq***, Sanjay Kumar, Sibte ul Hussain, and Hammad Naveed. "Predicting the pathogenicity of protein coding mutations using Natural Language Processing." In *2020 42nd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, pp. 5842-5846. IEEE, 2020.

Hammad Farooq, and Hammad Naveed. "Gpadrlx: Grouped phrasal adverse drug reaction lexicon." In *2019 IEEE International Conference on Signal Processing, Communications and Computing (ICSPCC)*, pp. 1-6. IEEE, 2019.

* Co-First Author

Honors & Awards

Travel Award: UIC Graduate Student Council Travel Award (2024) for a poster presentation at the CSHL Meeting on Epigenetics & Chromatin.

Travel Award: Biophysical Society Travel Award (2023) for a poster presentation at the BPS Annual Meeting.

Travel Award: UIC Graduate Student Council Travel Award (2023) for a poster presentation at the BPS Annual Meeting.

1st Place Oral Presentation: UIC Center for Bioinformatics and Quantitative Biology 2nd Annual Research Day (2022).

1st Place Poster Presentation: University of Illinois Cancer Center Dr. Gary Kruh Cancer Research Symposium and Student Poster Competition (2022).

Undergraduate Research Funding: Ignite (2017-18) under NGIRI, Pakistan.

Dean's List of Honor (SGPA $\geq$ 3.5): Recognized four times for academic excellence.

Inter-FAST CS Quiz Competition Winner: NaSCon'17, FAST-NU, Islamabad.

Intra-College Quiz Competition Winner: PCIT, Rawalpindi.

Presentations

Biophysical Society (BPS) Annual Meeting, 2025, Los Angeles: Oral and Poster Presentation.

American Society of Human Genetics (ASHG) Annual Meeting, 2024, Denver: Poster presentation.

Cold Spring Harbor Meeting: Epigenetics & Chromatin, 2024, New York: Poster presentation.

AMIA 2024 Informatics Summit Presentation, 2024, Boston: Oral presentation.

UIC CBQB 4th Annual Research Day, 2024, Chicago: Oral presentation.

Biophysical Society (BPS) Annual Meeting, 2023, San Diego: Poster presentation.

UIC CBQB 2nd Annual Research Day, 2022, Chicago: Oral presentation.

Cold Spring Harbor Meeting: Genome Organization & Nuclear Function, 2022, New York: Poster presentation.

Dr. Gary Kruh Cancer Research Symposium, 2022, Virtual: Poster presentation.

4th Annual UIC BME Research Symposium, 2022, Chicago: Oral presentation.

Biophysical Society (BPS) Annual Meeting, 2022, San Francisco: Poster presentation.

UIC CBQB First Annual Research Day, 2021, Chicago: Oral presentation.

Biophysical Society (BPS) Annual Meeting, 2021, Virtual: Poster presentation.

Peer Review Service

American Medical Informatics Association (AMIA) Annual Symposium, 2025

2025 47th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)

American Medical Informatics Association (AMIA) Clinical Informatics Conference, 2025

American Medical Informatics Association (AMIA) Annual Symposium, 2022

2021 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)