MD Rahmoon Shamdeed Kabir

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Education

University of Delaware ***2025 - present***
Phd in Bioinformatics
***Doctoral Advisor*:** Dr. Behnam Abasht
Doctoral Project Title: Allelic expression dynamics during development and its roles in genotype-phenotype relationships

Colorado College ***2021 - 2025***
Bachelor of Arts in Computer Science with distinction (summa cum laude)
Academic Advisor: Dr. Benjamin Nye

Research Experience

Student Researcher ***August 2024 - December 2024***
Artificial Intelligence Research Laboratory, HUN-REN Sztaki, Budapest, Hungary

- Investigated epigenetic aging and CpG association under Dr. Csaba Kerepesi.
- Developed rDNA-based epigenetic clock model in humans to integrate with rat rDNA clock since rDNA is evolutionarily conserved across species.
- Utilized the Bismark tool to extract methylation level of CpG sites from the RRBS-seq data in 182 samples.
- Investigating the causal CpG sites for aging using EWAS summary statistics data.
- Implemented complex data imputation techniques for missing data in CpG site methylation, exploring ALS and kNN that improved the lab's intersection clock's performance by ~12%.

Research Assistant ***June 2024 - August 2024***
Department of Molecular Biology, Colorado College

- Assistant to Dr. Sara J. Hanson's lab, responsible for analyzing gene sequences for centromere research.
- Analyzed G/C percentages, ~3kb inverted repeat flanks, and intergenic regions in the yeast genome.
- Developed a computational model to map centromere location in *Komagataella phaffi* using chromosome-level genome sequence.
- Developed a pipeline to identify centromere candidates in species having scaffold-level genome sequences.

Data Research Assistant (part-time) ***June 2023 - December 2023***
State of the Rockies Project, Colorado Springs, CO

- Analyzed quadrant data samplings for the Waldo Canyon Project under Dr. Cyndy Hine's supervision.
- Identified and mapped sampling quadrants in the north and south slopes using the ArcGIS tool.
- Modeled regeneration patterns of Ponderosa Pines in the Waldo Canyon wildfire burn area.
- Published reports in the State of the Rockies' yearly periodical, Anthropogenic.

Professional/Relevant Experience

Programming Analyst Intern ***June 2023 - August 2023***

Lexidyne LLC, Colorado Springs, CO

- Developed a random-forest classifier model to predict lung cancer risk using ~80,000 client-provided patient data with ~82% accuracy rate.
- Developed a cancer forecast model that projects future trends in diagnosis rate, disease stage, and demographic distribution up to 2050 using population data and the SEERStat Cancer Dataset.
- Set up a MySQL server for seamless storage and integration of databases to existing simulations in Java.
- Engaged in client meetings with AbbVie and Skyrizi under direct supervision.

Technology Portfolio Manager ***2023 - 2025***

Colorado College Investment Club, Colorado College

- Manage ~ $36,000 portfolio by performing stock transactions and reporting to the club advisor.
- Lead bi-weekly meetings with members for stock pitches to collectively invest and/or divest from stocks.
- Prepared end-of-year reports analyzing portfolio performance, strategies, and member engagement.
- Coordinate with the communication manager to organize alumni panels on investing, careers, and industries.

Venture Grant Recipient ***Fall 2022***

Office of the Dean, Colorado College

- Received $3,000 to collect research data for Dr. Charlotte Gabrielsen at the Environmental Studies dept.
- Traveled to Costa Rica to collect water temperature, salinity, and pH data from the mangroves on the Pacific and Atlantic coasts.

Student Orientation Leader **2022 / 2023 / 2024**

Office of Outdoor Education, Colorado College

- Facilitated a 7-day-long new students' orientation program for incoming freshmen.
- Led a group of 12 students on overnight camping trips.
- Mentored students throughout the year to facilitate student life success and orient them with various campus resources.

Skills

Programming Languages: Python, R, Java, SQL, C, C++, JavaScript, D3, HTML/CSS.

Tools and software: Git, Bash, SciPy, TensorFlow, PyTorch, Scikit-learn, NLTK, Pandas, Numpy, Matplotlib, Seaborn, Bismark, Seurat, ArchR, ClusterMap, BLAST, Parasail, NetworkX, Selenium, Stata, Excel, ArcGIS.

Computation and Data Analysis: Machine Learning, Deep Learning, Multimodal Regression, Hierarchical Bayesian Modeling, Reinforcement Learning, Data Visualization, Data Wrangling, Feature Engineering, Object-Oriented Programming.

Research Interest: Computational Genomics, Animal Genetics, Algorithms in Systems Biology, Muscle Development, Avian Biology.

Projects

GC Content Analysis in Yeast Species	*View Project*
Differentially Expressed Genes in scRNA-seq in High Glucose Treated Zebrafish Embryos	*View Project*
Price Factor Analysis of Airbnb Listings Using Random Forests	*View Project*
Ribosomal RNA and Tree of Life Analysis	*View Project*
Ant Colony Optimization in Travelling Salesman Problem	*View Project*
Soccer Betting Platform (FottyBettor)	*View Project*
Library Management System	*View Project*

Relevant Coursework

Computational Biology and Medicine	Computer Organization
Genetics	Software Design
Statistical Methods	Data Structures and Algorithms
Natural Language Processing	Computer Science I & II
Data Science	Computational Thinking
Structure and Dynamics of Complex Networks	Linear Algebra
Scientific Computing	Probability and Statistics
Data Visualization and Interpretation	Calculus II
Theory of Computation	Number Theory

Awards/Activities

Phi Beta Kappa Honors Society, *Beta of Colorado*	***May 2024***
Co-Chair, *Colorado College South Asian Students Association*	***2023 - 2025***
Event Organizer, *Colorado College Coding Club*	***2023 - 2025***
National Finalist, *International Biology Olympiad (IBO)*	***April 2021***
Multiple Gold Medalist, *Bangladesh Biology Olympiad (BdBO)*	***March 2020 / March 2021***
Silver Medalist, *Bangladesh Robotics Olympiad (BDRO)*	***July 2021***