Lisa Baek

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Education

Brown University, *Providence, RI* *Aug. 2022 – May 2026*

Relevant Coursework: GPA: 3.7
Design and Analysis of Algorithms, Data Structures and Algorithms, Introduction to Computer Systems, Object Oriented Programming, Machine Learning
Teaching Assistant: Multivariable Calculus, Partial Differential Equations
Activities: Hack@Brown, Women in Computer Science, Association of Women in Mathematics

Experience

Undergraduate Researcher, *Medford, MA, Tufts University* *Jun 2024 - Present*

- Improving the CRU-FM model for Probabilistic Modeling of Missingness in Irregular Time Series Medical Records using the MIMIC dataset (over 50,000 records), targeting a further reduction of the current MSE of 0.02 by optimizing the data pipeline.
- Conducting regression analysis on CRU-FM outputs across 5 baseline models to identify the top 3 most significant factors influencing model performance, refining methodologies to improve accuracy and efficiency by 10%.

Undergraduate Researcher, *Providence, RI, Brown University* *Jan 2024 - May 2024*

- Applied regression models, clustering algorithms, and dimensionality reduction techniques to identify limitations of the 'synthpop' R package for synthetic data generation on the BRFSS 2022 dataset.
- Tracked progress by visualizing data in R and organized meetings with the Brown Biostatistics department to inform data-driven decisions for sensitive datasets.

Undergraduate Researcher, *ICERM, Providence, RI* *Jun 2023 - Aug 2023*

- Collaborated with faculty and undergraduates, applying prior advancements in DNA self-assembly and fundamental graph theoretical concepts to model 3D structures in 2D.
- Utilized core theories from linear algebra and properties of k-regular graphs to develop tighter bounds, reducing the upper bound by 25% for specific graph formation

Projects

Hack@Brown Hackathon | *Python, Docker, API* Sep 2024 - Present

- Organized and developed hands-on sessions for a 500-person hackathon through weekly meetings, emphasizing effective API selection for diverse projects.
- Developed and enhanced student resources and starter packs to support project creation.

GeoLDM | *Python, PyTorch, Git* Mar 2024 – May 2024

- Developed generative model inspired by the Latent Diffusion Model to generate ground imagery conditional on satellite imagery
- Implemented variational autoencoder for ground image data processing and interpolation head for efficient geographic feature extraction

Database | *C, pthreads, Git* Nov 2023 – Dec 2023

- Designed and implemented a multi-threaded server to manage a key-value database over a network, supporting concurrent user interactions.
- Implemented features for querying, adding, removing, printing, and cleaning up database entries
- Ensured optimal performance, robust thread-safety and efficient signal handling through comprehensive testing and debugging of multi-threaded operations.

Skills

Languages: Java, Python, C, C++, MATLAB, R, JS, HTML, CSS, SQL
Frameworks: Node.js
Developer Tools: Git, Docker, Visual Studio, IntelliJ
Libraries: pandas, NumPy, Matplotlib, torch, TensorFlow