THUY TRANG NGUYEN

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Education

University of Massachusetts Amherst	**Expected May 2024**
Master of Science in Computer Science	**GPA: 3.94**

- **Coursework**: Advanced Algorithms, Software Design Principles, Machine Learning, Optimization in CS, Database Design and Implementation, Algorithms with Predictions

Bard College	*full-tuition stipend*	**May 2020**
Bachelor of Arts in Computer Science and Mathematics	**GPA: 3.98**

Technical Skills

Languages: Python, Java, C, SQL
Developer Tools: Git, VS Code, Vim
Technologies/Frameworks: TensorFlow, Pytorch, Git, Scikit-Learn, Apache Spark, React.js, Flask, Mosek, Matplotlib

Experience

UMass Amherst   **Sep 2020 - present**
PhD Researcher

- **Partitioned-Learned Count-Min Sketch** | *Python, Networkx, MOSEK, TensorFlow, NLTK, fastText*
  Developed and analyzed a learning-augmented space-efficient algorithm for identifying frequent elements in a data stream that outperforms prior baseline algorithms by achieving false positive rates that are **2x** lower across various datasets.
- **Learning-based Bloom-filter caching algorithms** | *Python, Sklearn, Tensorflow*
  Investigate the performance of Bloom filter (BF) cache admission algorithms by running simulations and modeling their behavior using theory. Devise Machine Learning-augmented BF caching algorithms that reduce the number of disk writes by **30%** while maintaining request and byte hit rates comparable to those of the most popular caching algorithm LRU.
- **Eigenvalue approximation via Sketching** | *Python, Networkx, SciPy, Matplotlib*
  Devised, analyzed, and implemented a time-efficient sketching-based algorithm for approximating eigenvalues of large matrices up to error parameter ϵ which computes eigenvalues of a much smaller $\mathcal{O}(\frac{1}{\epsilon^3} \times \frac{1}{\epsilon^3})$ approximation matrix instead of the original $n \times n$ matrix.

UMass Amherst | Algorithms for Data Science, Randomized Algorithms   **Sep 2021 - present**
Graduate Teaching Assistant

- Conduct weekly office hours for student guidance, closely monitor and engage on the Piazza forum, devise grading criteria, and aid in assessing assignments and exams for a 100+ student cohort.

Vooom | Python, Unix, TensorFlow, Scikit-learn   **Jul 2019 – Aug 2019**
Data Science Intern

- Designed and deployed a data pipeline for "Vehicle Rental" by mining and aggregating different datasets and performing outlier filtering using Python and shell scripts.
- Utilized this pipeline to conduct a comprehensive analysis and predictive modeling for vehicle rental demand (via Neural Nets, SVMs, and AdaBoosting) based on factors such as weather conditions, rental locations, vehicle types, and other relevant features.

Bard College   **Jun 2018 - Jul 2018**
Undergraduate Research Assistant

- Developed the "Color My Knot" knot coloring software that computes colorings of three-dimensional knots by finite quandles (Prolog). Found and reviewed errors in the Mathematica KnotData collection. [**pdf**]
- Devised a terminating and confluent term rewriting system (TRS) for the first-order equational theory of quandles. [**pdf**]

Projects

EleNA| *Python, Flask, React, OSMnx, and Networkx*

- Developed and implemented an elevation-based navigation system that allows a user to find hiking routes that maximize or minimize total elevation gain.

Multi-objective Package queries | *Python, PuLP for integer linear programming*

- Devised, implemented, and tested an extension to the package query language (which extends SQL to support higher-order query constraints) by allowing multiple objectives using a sequential solving approach.