WERONIKA (THUY TRANG) NGUYEN (she/her/hers)

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EDUCATION

Expected: Sep 2026 — **University of Massachusetts Amherst, College of Information and Computer Sciences**, Amherst, MA
MS/PhD in Computer Science; Advised by Prof. Cameron Musco; GPA: 3.90
Coursework: Advanced Algorithms, Machine Learning, Optimization in CS, Computation Theory, Databases, Algorithms with Predictions, Foundations of Applied Cryptography, Algorithms with Predictions

Sep 2016 - May 2020 — **Bard College**, Annandale-on-Hudson, NY
B.A. in Computer Science and Mathematics; GPA: 3.98

RESEARCH INTERESTS

I study algorithms, working at the intersection of computer science theory, machine learning as well as numerical linear algebra. I am particularly interested in learning augmented algorithms for sketching.

RESEARCH EXPERIENCE

Sep 2020 - present — **University of Massachusetts Amherst**, *PhD Researcher, Theory Lab*

• Devise and analyze sublinear time algorithms for estimating eigenvalues of a data matrix using sketching; implement the algorithms and compare their performance with sampling- and low-rank-approximation- based algorithms in terms of the estimation error as well as number of matrix-vector products,

• Develop and analyze the partitioned-learned count-min sketch data structure which is a learning-based algorithm for identifying frequent elements in a data stream that outperforms prior baseline models in terms of the false positive rate on various datasets,

• Investigate the performance of cache admission algorithms that use Bloom filters by implementing the algorithms on the *nginx* platform as well as model their behavior using footprint descriptor theory; devise learning-based Bloom filter caching algorithms that outperform simple caching algorithms that do not use Bloom filters in their admission policy.

Jul 2019 - Aug 2019 — **Vooom,** *Data Science Intern*

• Performed an analysis of the company's data,
• Deployed a data pipeline for "Vehicle Rental" by aggregating multiple datasets from different sources and filtering outliers based on factors such as reservation length; implemented using python (pip, unix, shell, tensorflow, sklearn) and shell scripts for preprocessing raw data,
• This pipeline is being used to analyze and predict vehicle rentals based on weather, rental location, vehicle type and other relevant features.

Sep 2019- May 2020 — **Bard College,** Senior Thesis

• Thesis Title: Connectedness in Cayley Graphs and P/NP Dichotomy for Quay Algebras,
• Studied the extent to which the P/NP dichotomy of finite algebras can be cast in terms of connectedness in Cayley graphs.

Jun 2018 - Jul 2018 — **Bard College, Bard Summer Research Program,** *Undergraduate Research Assistant*

• Conducted research on the first-order equational theory of quandles,
• Worked on the CMK “Color My Knot” knot coloring software that computes colorings of three-dimensional knots by finite quandles. Reviewed errors in the *Mathematica* KnotData collection.

PUBLICATIONS

A Terminating and Confluent Term Rewriting System for the Pure Equational Theory of Quandles. Robert W. McGrail, Thuy Trang Nguyen, Thanh Thuy Trang Tran, and Arti Tripathi. 20th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC), September, 2018. Timișoara, Romania,

Knot Coloring as Verification. Robert W. McGrail, Thuy Trang Nguyen, and Mary Granda. Proceedings of the 22nd Annual Symposium of Symbolic and Numeric Algorithms for Scientific Computing (SYNASC). Timișoara, Romania. September 1-4, 2020. IEEE Computer Society.

PRESENTATIONS

Dec 2022 **Online Algorithms with Multiple Predictions**
Umass Amherst CICS, CS692K - Algorithms with Predictions Seminar

Oct 2022 **Sublinear Time Eigenvalue Estimation**
Umass Amherst CICS, Undergraduate Research Night

Mar 2022 **Sketching Techniques for Hinge Loss**
Umass Amherst CICS, Theory Group

Nov 2021 **Oblivious Sketching for Logistic Regression**
Umass Amherst CICS, CS Theory Seminar

May 2021 **Linear Sketching**
Umass Amherst CICS, Theory Group

Nov 2020 **Partitioned Learned Bloom Filters**
Umass Amherst CICS, CS Theory Seminar

AWARDS / ACADEMIC HONORS

Fall 2020 UMass Amherst CICS Scholarship Award

Fall 2016 - Spring 2020 Bard College Distinguished Scientist Scholarship Award, *full-tuition stipend;* Bard College Honors Student

TEACHING EXPERIENCE

Spring 2022 **University of Massachusetts Amherst, *CS690RA - Randomized Algorithms***
Graduate Teaching Assistant

Fall 2021, Spring 2022 **University of Massachusetts Amherst, CS514 - *Algorithms for Data Science***
Graduate Teaching Assistant

Fall 2017 - Spring 2019 **Bard College**, **Drop-in Computer Science Tutor** for CS201 - Data Structures, CS141 - OOP, CS141 - Discrete Math
Undergraduate Tutor

Fall 2018 **Bard College**, **MATH245 - Intermediate Calculus**
Undergraduate Tutor

Fall 2018 **Bard College**, **Math Study Room**
Undergraduate Tutor

Spring 2018 **Bard College**, **CS201 - Data Structures**
Undergraduate Tutor

TECHNICAL SKILLS

***Programming Languages*:** Python, Java (and Processing), C, SQL, HTML, PHP
***Tools & Libraries*:** TensorFlow, Pytorch, Pandas, Scikit-Learn, Apache Spark, STATA

PROJECTS github.com/thuytrang-nguyen

LEADERSHIP & ACTIVITIES

Sep 2022 - present University of Massachusetts Amherst, **Tea Totallers**, *event planner and coordinator,*
Sep 2022 - present University of Massachusetts Amherst, **Graduate Students of Color Association***, member,*
Sep 2020 - present University of Massachusetts Amherst, **CS Women's Group**, *member,*
Dec 2021 - Jan 2021 University of Massachusetts Amherst, **Undergraduate Research Volunteer Program**, *mentor,*
Sep 2016 - May 2020 Bard College, **Asian Student Organization**, *member,*
Sep 2017 - Dec 2017 Bard College, **Girls Math Club**, *volunteer,*
Sep 2016 - May 2020 Bard College, **International Students Organization**, *member,*
Sep 2016- Sep 2017 Bard College, **Women in STEM**, *member*.

LANGUAGES Proficient in English, Polish, German, Vietnamese; intermediate Chinese.