Tahseen W. Rabbani

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Overview

- Current research interests include machine learning, tensors, and non-convex optimization.
- Programming proficiencies include Python, Java, R and Mathematica.

Education

University of Maryland College Park, MD, U.S.A. • Ph.D. Student, Fall 2018 - Present
    GPA: 4.00/4.00
    Areas:
- Spring 2020 - Present: Computer Science Ph.D. Program
- Fall 2018 - Fall 2019: Mathematics Ph.D. Program (GPA: 3.79/4.00)

New York University New York City, NY, U.S.A. • Master's Program in Mathematics, Fall 2017 - Spring 2018 (non-degree)
    GPA: 3.81/4.00

University of Virginia Charlottesville, VA, U.S.A. • Bachelor of Arts in Mathematics, Class of 2015
    Concentration: Graduate Preparatory
    GPA: 3.81/4.00 (Major), 3.64/4.00 (Cumulative)

Awards & Grants

2020 COMBINE Fellow (NSF Award #1632976).

2019 NSF GRFP Honorable Mention.

2019 Spotlight on Grad. Research: Seymour Goldberg Memorial Award. Univ. of Maryland.

2015 Distinguished Majors Program (**High Distinction**). University of Virginia. Thesis: *p-adic Numbers and the Hasse-Minkowski Theorem.*

2015 Small Research and Travel Grant (**$636**, University of Virginia College of Arts & Sciences).

2014 Research Grant (**$2500**, Provost's Office and Dept. of Mathematics).

2013 Small Research and Travel Grant (**$480**, University of Virginia College of Arts & Sciences).

2012-2015 Echols Scholar. University of Virginia.

Employment

University of Maryland (College Park, WI, Jan. 2020 - Present)
Graduate Research Assistant
- F. Huang, A. Reustle (NASA Goddard), and I developed a fast convolution algorithm for tensorial neural networks (TNNs), which are a recently-proposed generalization of neural networks.
- I developed a novel class of accelerated power methods for PCA which mimic the performance of existing momentum-based power methods but without the need for sensitive hyperparameters.

Epic Systems (Madison, WI, Sep. 2015 - May 2017)
Software Developer

Epic develops electronic medical record (EMR) software for hospital systems. I worked on a team primarily concerned with the preservation of database pointers during digital exchange of EMRs between hospitals.

Publications & Papers

1. (Submitted) T. Rabbani, A. Rajkumar, and F. Huang. "Practical and Fast Momentum-Based Power Methods."

2. F. Huang, T. Rabbani, and A. Reustle. "Fast GPU Convolution for CP-decomposed Tensorial Neural Networks," *Proceedings of SAI Intelligent Systems Conference. (2020)*

3. K. Smith and T. Rabbani. "Nonabelian Orthogonal Building Sets," *Proceedings of FQ14: The 14th International Conference on Finite Fields and their Applications.* (2020)

4. (Submitted) J. Davis, J. Dillon, J. Jedwab, K. Smith, T. Applebaum, J. Clikeman, and W. Yolland. "Constructions of difference sets in nonabelian 2-groups." (2019)

5. T. Rabbani. "Unique minimal forcing sets and forced representation of integers by quadratic forms," *Rose-Hulman Undergraduate Journal of Mathematics*, Vol. 17, **1** (2016).

6. T. Rabbani. "Improving the Error-Correcting Code Used in 3-G Communication," *SIAM Undergrad. Research Online (SIURO)*, **8** (2015), 126-137.