

Madhumitha Harishankar, Ph.D. Candidate

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Summary

Fourth year PhD candidate at Carnegie Mellon University, with a Bachelors in ECE from Rutgers University and ~3 years of experience as a software engineer. Research interests in applying machine learning for incentive design in wireless networks and sensing systems, specifically, deep learning, reinforcement learning, auction theory and network economics. Engaged in various graduate coursework and research projects in these areas.

Education

- 2016 – present **Ph.D., Electrical and Computer Engineering, Carnegie Mellon University, Moffett Field, CA.**
GPA: 3.93
Recognitions:
- **Honorable Mention** by the NSF Graduate Research Fellowship Program as a recognition of significant academic achievement.
 - **Dean's Fellow**, covers expenses of the first year of graduate study.
- Graduate Coursework:** Network Resource Allocation, Numerical Methods for Engineers, Security and Fairness of Deep Learning, Deep Reinforcement Learning and Control, Applied Stochastic Processes, Advanced Wireless Networks, Wireless Network Security, Mobile and Pervasive Computing
Teaching Assistant: Introduction to Machine Learning for Engineers (18-661), Wireless Security (18-637)
- 2010 – 2013 **B.S. Electrical and Computer Engineering, Rutgers University, New Brunswick, NJ.**
GPA: 3.87
Recognitions:
- **James Slade Scholar**, recognition of excellent performance in the Honors Program and completion of 1 year of undergraduate research.
 - **Summa Cum Laude**, outstanding undergraduate performance.
 - **3rd Best Capstone Design Project** in the Electrical and Computer Engineering Dept. We developed an Android application that enables the mobile phone to be used as a mouse and keyboard for a remotely connected PC.
 - Appeared in the **Dean's List** each semester.
 - Numerous merit-based undergraduate scholarships.

Research Publications

Journal Articles

- 1 **Harishankar, Madhumitha, Pikala, S., Sharma, P., Srinivasan, N., Joe-Wong, C., & Tague, P. (2019).** User-driven Resource Guarantees for Interactive Multimedia Sessions via Combinatorial Auctions: An Ad Hoc Slicing Approach. In *IEEE Journal on Selected Areas in Communication (JSAC) - Special Issue on Multimedia Economics for Future Networks*. IEEE.

Conference Papers

- 2 Han, J., Chung, A., Sinha, M., **Harishankar, Madhumitha**, Pan, S., Young-Noh, H., ... Tague, P. (2018). Do You Feel What I Hear? Enabling Autonomous IoT Device Pairing using Different Sensor Types. In *Proceedings of IEEE Symposium on Security and Privacy 2018 (Oakland S&P)*. IEEE.
- 3 **Harishankar, Madhumitha**, Srinivasan, N., Joe-Wong, C., & Tague, P. (2018). To Accept or Not to Accept: The Question of Supplemental Discount Offers in Mobile Data Plans. In *IEEE INFOCOM 2018-The 37th Annual IEEE International Conference on Computer Communications*. IEEE. **Awarded Student Travel Grant.**

Workshop Papers

- 4 **Harishankar, Madhumitha**, Tague, P., & Joe-Wong, C. (2018). Network Slicing as an Ad-hoc Service: Opportunities and Challenges in Enabling User-Driven Resource Management in 5G. In *Proceedings of 1st International Workshop on Trustworthy and Real-time Edge Computing for Cyber-Physical Systems (TREC4CPS); co-located with RTSS'19*. Institute for Software Integrated Systems, Vanderbilt University. **Awarded Student Travel Grant.**
- 5 Han, J., **Harishankar, Madhumitha**, Wang, X., Chung, A. J., & Tague, P. (2017b). Convoy: Physical Context Verification for Vehicle Platoon Admission. In *Proceedings of the 18th International Workshop on Mobile Computing Systems and Applications (HotMobile)* (pp. 73–78). ACM.

Posters and Demos

- 6 Han, J., **Harishankar, Madhumitha**, Wang, X., Chung, A. J., & Tague, P. (2017a). Convoy: Physical Context Verification for Vehicle Platoon Admission. In *Proceedings of the 18th International Workshop on Mobile Computing Systems and Applications (HotMobile)* (pp. 73–78). ACM. **Best poster runner-up award.**

Service and Leadership

- 2019
 - Sponsor and Mentor for an [INI Practicum](#) team of 4 MS students
 - Peer reviewer for journal IEEE Transactions on Mobile Computing (TMC)
 - External reviewer for IEEE Wireless Communications and Networking Conference (WCNC)
 - External reviewer for IEEE Conference on Computer Communications (INFOCOM)
- 2018
 - Coordinated with the CMU Blockchain Group in Pittsburgh to have their events live-broadcasted to the Silicon Valley campus for wider participation.
- 2016
 - **President**, Women in ECE (WinECE), Carnegie Mellon University - Silicon Valley.
- 2014
 - **Technical Manager**, Women in Technology Networking program, Barclays Investment Bank.
 - **Mentor**, Streetwise Partners volunteer program to further academic and professional goals of underprivileged youth.
- 2013
 - **Vice-President**, IEEE-HKN Honor Society, Rutgers University, New Brunswick.

Recognitions

- 2019
 - **Selected to attend** the NSF-sponsored NeTS Early Career Investigators Workshop and **awarded travel grant.**

Recognitions (continued)

- 2017 **■ Awarded Honorable Mention** by the National Science Foundation Graduate Research Fellowship Program (NSF-GRFP) as a recognition of significant academic achievement
- 2016 **■ Awarded full sponsorship** to Computing Research Association Women's (CRA-W) 2016 Grad Cohort Workshop.
- Dean's Fellow**, Carnegie Institute of Technology – 2016
- 2015 **■ Winner**, Microsoft International Women's Hackathon - Phoenix, Arizona.
- Nominated and sponsored** by AWS Kumo to attend the Grace Hopper Celebration of Women in Computing.
- 2014 **■ Nominated and sponsored** by Barclays as one of five employees from the firm to attend the Grace Hopper Celebration of Women in Computing.
- 2013 **■ James Slade Scholar**, Electrical and Computer Engineering Dept., Rutgers University. Awarded as a recognition of excellent performance in the Honors Program and successful completion of 1 year of undergraduate research.
- Summa Cum Laude**, Rutgers University. Highest honors awarded by the university recognizing outstanding undergraduate performance.
- 3rd Best Capstone Design Project**, Electrical and Computer Engineering Dept., Rutgers University. We developed an Android application that enables using a smartphone to provide mouse and keyboard inputs for a remote PC.
Moused <https://play.google.com/store/apps/details?id=com.droidinput>
- 2010-2013 **■ Dean's List**, Electrical and Computer Engineering Dept., Rutgers University, recognizing high academic performance each semester.
- Numerous merit-based undergraduate scholarships.**

Employment History

- May-Aug 2018 **■ Operations Research Intern**, Innovation Labs, Myntra Designs Pvt. Ltd., Bangalore
- As the leading e-commerce fashion company in India, Myntra ships millions of clothing pieces to customers across the country during peak sale months. During my internship, I did the following:
- Aggregated data from different parts of Myntra's order and shipping process to visualize their transport hubs, distribution centers and the end-to-end route taken by shipments from warehouses to customers.
 - Defined metrics for measuring transport efficiency and generated corresponding analytics on their logistics performance during peak sale months.
 - Analyzed alternate logistic models based on location-routing modeling.

Employment History (continued)

- 2015 **Software Development Engineer** Amazon Web Services Inc., Seattle, WA.
- Developed a knowledge-base for aiding in the resolution of support tickets created by AWS customers for various service and billing issues.
 - Designed a search-optimized datamodel based on Elasticsearch, addressing concerns of network partitions, write concurrency etc. Built-in rolling deployments with regression tests to minimize outage risk during a release.
 - Designed and developed AWS-compliant authentication and authorization framework for access to the knowledge-base.
 - Developed a document schema that was generalizable to data from any of our sources and exposed custom search APIs exploiting this, which helped improve the latency of search queries typically executed.
- 2013-2014 **Software Developer** Barclays Investment Bank, New York City, NY.
- Spearheaded the Autosys Audit project. Mined data from various divisions of the firm to develop a comprehensive view of the firm's entire network infrastructure and provide automated means for its update.
 - Automated Unix and Windows support operations, generating 1000+ YoY run-rate saves for the firm.
 - At the Portfolio Analytics team POINT, used Hadoop and EMR to monitor the generation of analytics reports requested by customers and prune underutilized ones, saving compute resources.

Skills

- Languages **Java, C + +, Python, PHP, Perl, Groovy, C#.NET**
- Frameworks **Elasticsearch, Spring, AWS ecosystem, ASP.Net, jQuery, Bootstrap.js, Handlebars.js**
- Hadoop **HDFS, Pig, Impala, Hive, AWS EMR**
- Databases **MySQL, MSSQL, Elasticsearch, DynamoDB, Linq**
- Tooling **Teamcity, Ant, Maven, Gradle, Sonarqube**

References

Prof Patrick Tague

Associate Research Professor

Electrical and Computer Engineering, and Information and Networking Institute

Associate Director of Information and Networking Institute

Carnegie Mellon University, Silicon Valley Campus

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