Akshay Aravamudan

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Website
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Employment History

Aug 2016 – present
Research Assistant, Department of Computer Engineering and Sciences, Florida Institute of Technology. I am currently working towards my doctorate. My main research involves stochastic temporal point processes in the context of social media. In addition, I work with Hydrologists to develop machine learning tools to improve tasks such as peak stream-flow prediction and the production of high resolution flood inundation maps. I was also in a project involving the AFRL (Air Force Research Lab) wherein we explore the utility of machine learning on computationally constrained edge devices.

Jul 2019 – Nov 2019
Teaching Assistant, Machine learning primer for UCF/Disney's Lifelong Learning Program. Aided Dr. Georgios C. Anagnostopoulos with development of lecture and lab material. Concepts included Linear Regression, Logistic Regression, Deep Neural Networks such as MLPs and RNNs.

Aug 2016 – May 2019
Interface Developer, Department of Systems Engineering, Florida Institute of Technology. We worked with a local manufacturing plant to produce visualization and simulation to streamline the manufacturing process. Jobs involved graph visualization and development of a discrete event simulation engine to derive actionable insights.

Aug 2015 – May 2016
Mathematics Tutor, Mathematics Advancement Centre (MAC), Florida Institute of Technology. Tutored students in Precalc, Calc 1, Calc 2, Calc 3, Differential Equations and Linear Algebra.

Education

Aug 2019 – present
Ph.D. Computer Engineering, Florida Institute of Technology. Under advisement of Dr. Georgios C. Anagnostopoulos.

Aug 2018 – Jul 2019
M.S. Computer Engineering, Florida Institute of Technology, Focus in Machine learning and Computing. Under advisement of Dr. Georgios C. Anagnostopoulos
Thesis title: *Modelling Information diffusion via Survival Processes*.

Aug 2014 – May 2018
B.S. Computer Engineering, Florida Institute of Technology, Summa Cum Laude, Minor in Computational Mathematics.

Research Publications

My publications have spanned works in three major fields. (i) Stochastic point processes (ii) Machine learning on the edge (iii) Machine learning for Hydrology. Most of these works were done in Python with the exception of one in Java (for android).

Publications

1. **Aravamudan**, A., Zhang, X., & Anagnostopoulos, G. C. (2023). Anytime user engagement prediction in information cascades for arbitrary observation periods. **[To Appear in AAAI 2023 proceedings]**.

2. Kabealo, R., Wyatt, S., **Aravamudan**, A., Zhang, X., Acaron, D. N., Dao, M. P., … Lam, E. (2023). A multi-firearm, multi-orientation audio dataset of gunshots. *Data in Brief*, 109091. doi:https://doi.org/10.1016/j.dib.2023.109091

3. Zhang, X., **Aravamudan**, A., & Anagnostopoulos, G. C. (2022). Anytime information cascade popularity prediction via self-exciting processes. In K. Chaudhuri, S. Jegelka, L. Song, C. Szepesvari, G. Niu, & S. Sabato (Eds.), *Proceedings of the 39th international conference on machine learning* (Vol. 162, pp. 26028–26047). PMLR. Retrieved from https://proceedings.mlr.press/v162/zhang22a.html

4. Nieves Acaron, D., Luchterhand, B., **Aravamudan**, A., Elliott, D., Wyatt, S., Otero, C. E., … Lam, E. (2022). ACE: An ATAK plugin for enhanced acoustic situational awareness at the edge. Accepted as an oral presentation to MILCOM 2021.

5. Rasheed, Z., **Aravamudan**, A., Sefidmazgi, A. G., Anagnostopoulos, G., & Nikolopoulos, E. (2021). Advancing flood warning procedures in ungauged basins with machine learning. *Journal of Hydrology*. **[Under Review]**. doi:10.31223/X5X03X

6. **Aravamudan**, A., Zhang, X., Song, J., Fiore, S. M., & Anagnostopoulos, G. C. (2021). Influence dynamics among narratives. In R. Thomson, M. N. Hussain, C. Dancy, & A. Pyke (Eds.), *Social, cultural, and behavioral modeling* (pp. 204–213). Acceptance rate: 57% (32/56). doi:10.1007/978-3-030-80387-2_20

7. Wyatt, S., Elliott, D., Aravamudan, A., Otero, C. E., Otero, L. D., Anagnostopoulos, G. C., … Lam, E. (2021). Environmental sound classification with tiny transformers in noisy edge environments. In *2021 ieee 7th world forum on internet of things (wf-iot)* (pp. 309–314). doi:10.1109/WF-IoT51360.2021.9596007

Presentations

1. **Aravamudan**, A., Rasheed, Z., Zhang, X., Anagnostopoulos, G. C., Krajewski, W. F., & Nikolopoulos, E. I. (2021). Deep residual downscaling of remote sensing imagery for flood hazard assessment. In *Abstract h42c-02, fall meeting, american geophysical union*. [**abstract & presentation**], New Orleans, LA. Retrieved from https://agu.confex.com/agu/fm21/meetingapp.cgi/Paper/967205

2. Rasheed, Z., **Aravamudan**, A., Sefidmazgi, A. G., Anagnostopoulos, G., & Nikolopoulos, E. (2021). Flood inducing storm detection and peak flow prediction with machine learning. url: https://events.withgoogle.com/google-flood-forecasting-workshop-1/speakers. Google Flood Forecasting Workshop 2021.

3. Rasheed, Z., **Aravamudan**, A., Anagnostopoulos, G. C., Sefidmazgi, A. G., & Nikolopoulos, E. I. (2020). Machine learning for flood peak prediction in ungauged basins. In *American Geophysical Union (AGU) Fall Meeting 2020*. [**extended abstract**]. Retrieved from https://agu.confex.com/agu/fm20/meetingapp.cgi/Paper/749892

4. Zhang, X., **Aravamudan**, A., Koufakou, A., Gunaratne, C., Garibay, I., & Anagnostopoulos, G. (2020). Predicting software vulnerability exploits from social media confabulations. In *6th International Conference on Computational Social Science (IC²S²)*. [**extended abstract & poster**], Massachusetts Institute of Technology, Cambridge, MA. Retrieved from https://www.youtube.com/watch?v=YzmHUejqdn4

Upcoming Submissions

1. Zhang, X., **Aravamudan**, A., & Anagnostopoulos, G. C. (2022). Predicting software vulnerability exploits from social media confabulations. **[To be submitted to IEEE Transactions on Dependable and Secure Computing]**.

Awards

- AAAI 2023, Student Travel Scholarship
- SBP-BRiMS 2021, Travel Scholarship
- Distinguished Student Scholar, Florida Institute of Technology, 2018

Press

- The article on virality of memes was shared on several other news websites such as TechXplore, leadersnet.de and spacecoast daily.
- Our 2022 ICML paper was featured in Florida Tech's news website.

Skills

Coding	Python, Java, C, C++ and LaTeX.
Python libraries	Dask, Numpy, Scipy, Keras, PyTorch, librosa, pyroomacoustics and OpenCV.
Technologies	AWS: CodeBuild, CodePipeline, S3, EC2, CLI. Linux, MPI, OpenMP, CUDA, git and svn.
ML modelling	Neural networks, decision trees, gradient boosting, random forests, probabilistic modelling, stochastic processes, convex optimization, image super-resolution.
Deep Learning Models	Recurrent Neural Networks, LSTMs, Graph Neural Networks, Residual Dense Networks (RDNs) for image super-resolution.
Misc.	Academic research, teaching, and LaTeX typesetting.

Professional Service

- Volunteer, 2023 AAAI conference on Artificial Intelligence (*AAAI 2023*).
- Volunteer, 2021 International Conference on Machine Learning (*ICML 2021*).
- Reviewer, 2021 International Conference on Systems, Man & Cybernetics (*IEEE-SMC 2021*); 1 papers.
- Member, Technical Program Committee, 2021, 2022 International Conference on Social Computing, Behavioral-Cultural Modeling & Prediction and Behavior Representation in Modeling and Simulation (*SBP-BRiMS 2021*); 4 papers, (*SBP-BRiMS 2022*); 3 papers.
- Volunteer, 2021 International Conference on Learning Representations (*ICLR 2021*).
- Sub-reviewer, 2021 Conference on Autonomous Agents & Multi-Agent Systems (*AAMAS 2021*); 1 paper, (*AAMAS 2022*); 1 paper.
- Reviewer, IEEE Transactions on Cybernetics; 3 papers.
- Reviewer, AISTATS 2022, 2023 International Conference on Artificial Intelligence and Statistics ; 7 papers.

References

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