Patrick Emami

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Education

† *Indicates expected*

2016–2021 †	**University of Florida**, Gainesville, FL Ph.D., Computer Science	Advisor: Dr. Sanjay Ranka
2012–2016	**University of Florida**, Gainesville, FL B.Sc., Computer Engineering	Cum Laude, GPA: 3.74/4.0

Research and Industry Experience

2016–present	**MALT Lab**, Research Assistant Deep generative models for multi-object spatiotemporal data
2016–present	**UF Transportation Institute (UFTI)**, Research Assistant Algorithm development and field deployment of real-time multi-sensor fusion for traffic intersection optimization
2015–2016	**Machine Intelligence Lab (MIL)**, Undergraduate Research Assistant Motion planning for Subjugator, an AUV with 6 DOF
Summer 2015	**Amazon.com, Inc.**, Software Development Engineering Intern Developed an Android image processing library for scanning PDF417 barcodes during driver registration in the Prime Now app
2013-2015	**Center for Intelligent Machines and Robotics (CIMAR)** Undergraduate Research Assistant Developed a Python framework for implementing Partially Observable Markov Decision Processes

Selected Honors and Awards

2020	Student of the Year USDOT STRIDE Center (10 universities) ($1,000)
2016–present	McKnight Doctoral Fellowship ($65,000)
2016–present	CISE Department Graduate Research Fellowship ($150,000)
2016	President's Honor Roll
2015–2016	Northrop Grumman Engineering Scholarship ($1,000)
2014–2015	University Scholars Program Research Grant ($1,750)
2014	IROS'14 Best Entertainment Robots and Systems Paper Finalist

Summer Schools

Summer 2019	**Machine Learning Summer School (MLSS) London**

Teaching

Summer 2018	**UF Student Science Training Program** Intro to Machine Learning — Curriculum Design and Course Instructor

Mentoring

Fall 2018–present	Kevin Chow (B.Sc.)	University of Florida
Fall-Summer 2018	Anuran Rouchowdhury (M.Sc)	University of Florida
Summer 2018	Ian Pelakh (B.Sc.)	University of Florida
Fall 2017	Shalaka Naik (M.Sc), Individual Study	University of Florida
Fall 2017	Vivek Gade (M.Sc), Individual Study	University of Florida
Summer 2017	Jabari Wilson (B.Sc.), Summer Undergraduate Research Fellow	University of Alabama

Volunteering

2017–2018	**UF Teaching Youth Programming Essentials**, Curriculum Lead Responsible for designing and improving the UF TYPE programming curriculum
2016–2017	**UF Teaching Youth Programming Essentials**, Instructor Teach an after school Intro to Programming course at local high schools
2014–2015	**UF Association of Computer Engineers**, Co-Founder and Project Manager Organized and presented at technical and professional development workshops for undergraduate computer engineering students

Professional Activities

2020	**NeurIPS Workshop on Interp. Inductive Biases and Phys.**, Reviewer
2020	**Transportation Research Board Annual Meeting (TRBAM)**, Reviewer
2020	**Optimization Letters**, Reviewer
2019	**UF Informatics Institute Student Data Analysis Seminar**, Co-Organizer
2018	**UF Informatics Institute Student Data Analysis Seminar**, Co-Organizer
2018	**International Conference on Machine Learning and Data Science**, Reviewer
2018	**IEEE Intelligent Transportation Systems Conference**, Special Session Chair
2018	**IEEE Intelligent Transportation Systems Conference**, Reviewer
2017	**International Conference on Machine Learning and Data Science**, Reviewer
2017	**UF Informatics Institute Student Data Analysis Seminar**, Co-Organizer
2016–2018	**UF Machine Learning Reading Group**, Organizer

Professional Societies

2018–present	Alpha Epsilon Lambda Graduate Honor Society, member
2017–present	ACM, student member
2016–present	IEEE, student member
2014–present	IEEE Eta Kappa Knu Honor Society, member

Publications

Peer-Reviewed Journals

[1] **Emami, P.**, & Elefteriadou, L., & Ranka, S. Simple and Online 3D Tracking of Objects Near and Far at Traffic Intersections with Video and Radar. Transactions on Intelligent Transportation Systems. 2020. *In preparation*.

[2] **Emami, P.**, & Panos M. P., & Elefteriadou, L., & Ranka, S. Machine Learning Methods for Data Association in Multi-Object Tracking. ACM Computing Surveys, 53, 4, Article 69. 2020.

[3] Pourmehrab, M., **Emami, P.**, Martin-Gasulla, M., Wilson, J., Elefteriadou, L., Ranka, S. Signalized Intersection Performance with Automated and Conventional Vehicles: A Comparative Study. Journal of Transportation Engineering, Part A: Systems 146.9. 2020.

Peer-Reviewed Conferences and Workshops

[1] **Emami, P.**, He, P., Rangarajan, A., Ranka, S. A Symmetric and Object-Centric World Model for Stochastic Environments. 34th Conference on Neural Information Processing Systems Workshop on Object Representations for Learning and Reasoning. 2020. ***Accepted as Spotlight***.

[2] **Emami, P.**, He, P., Rangarajan, A., Ranka, S. Efficient and Symmetry-Preserving Variational Inference for Multi-Object Representation Learning. 2020. *In preparation.*

[3] **Emami, P.***, Vargas, L.*, Traynor, P. CCSW 2020: The ACM Cloud Computing Security Workshop. 2020. **Equal contribution*

[4] **Emami, P**., Pourmehrab, M., Martin-Gasulla, M., Ranka, S., Elefteriadou, L. A Comparison of Intelligent Signalized Intersection Controllers Under Mixed Traffic. IEEE Intelligent Transportation Systems Conference, 2018.

[5] Omidvar, A., Pourmehrab, M., **Emami, P**., Kiriazes, R., Esposito, J., Letter, C., Elefteriadou, L., Ranka, S., Crane, C. Deployment and Testing of Optimized Autonomous and Connected Vehicle Trajectories at a Closed-Course Signalized Intersection. Transportation Research Board's 97th, 2018.

[6] **Emami, P**., Elefteriadou, L., Ranka, S. Tracking Vehicles Equipped with Dedicated Short-Range Communication at Traffic Intersections. 7th ACM International Symposium on Design and Analysis of Intelligent Vehicular Networks and Applications (DIVANet'17), 2017.

[7] Hamlet, A., **Emami, P**., Crane, C. The Cognitive Driving Framework: Joint Inference for Collision Prediction and Avoidance in Autonomous Vehicles. In the 15th International Conference on Control, Automation and Systems (ICCAS), pp. 1714-1719. IEEE, 2015.

[8] Hamlet, A., **Emami, P**., Crane, C. A Gesture Recognition System for Mobile Robots That Learns Online. In the 2014 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'14), pp. 2114-2119. IEEE, 2014.

Preprints

[1] **Emami, P.**, & Ranka, S. Learning Permutations with Sinkhorn Policy Gradient. arXiv:1805.07010 [cs.LG], 2018.

[2] **Emami, P.**, & Panos M. P., & Elefteriadou, L., & Ranka, S. Machine Learning Methods for Solving Assignment Problems in Multi-Target Tracking. Under review at ACM Computing Surveys. arXiv:1802.06897 [cs.CV], 2018.

Posters

[1] **Emami, P**., & Pourmehrab, M., & Elefteriadou, L., & Ranka, S., & Crane, C. A Demonstration of Fusing DSRC and Radar for Optimizing Intersection Performance. Automated Vehicles Symposium (AVS'17), 2017.

Blog Posts

[1] **Emami, P**. Deep Deterministic Policy Gradients in Tensorflow. http://pemami4911.github.io/blog/2016/08/21/ddpg-rl.html. 2016. > 100K unique views (Google Analytics).