

EDUCATION

- University of California Santa Barbara**

 - *PhD Candidate in Electrical and Computer Engineering;*
Advisor: Prof. Ramtin Pedarsani

Santa Barbara, CA
Jun 2020 – Present
- University of California Santa Barbara**

 - *Master of Science in Electrical and Computer Engineering; GPA: 4.00/4.00*

Santa Barbara, CA
Sep 2018 – Jun 2020
- Stony Brook University**

 - *Bachelor of Engineering in Electrical Engineering;*
Bachelor of Engineering in Applied Mathematics and Statistics; GPA: 3.84/4.00

Stony Brook, NY
Aug 2013 – Jun 2017

RESEARCH INTERESTS

- **Reinforcement Learning:** Reinforcement Learning (RL) has shown great success in training agents to solve human-relevant tasks. One area of interest has been leveraging RL techniques in decentralized multi-agent problems. In a past project, I have looked at the challenge of coordinating agents to cooperate in such environments, analyzing the benefit gifting has in guiding agents towards socially desirable equilibria [4]. Another area within RL that I have investigated is imitation learning and learning from mixed and sub-optimal data. In a recent project I propose an algorithm that learns a policy from sub-optimal data by inferring information from estimated models of the different annotators [1].
- **Adversarial Machine Learning:** Parallel to the rising popularity of utilizing deep neural network architectures, we have been witnessing how fragile the very same prediction models are. Tiny perturbations to the inputs can cause misclassification errors throughout entire datasets. In a recent work, I have explored the specific setting of ℓ_0 -bounded adversarial attacks. Based on theoretical evidence from my advisor's earlier work, we propose an algorithm and analyze its robustness on large image datasets such as MNIST and CIFAR [3]. We plan to continue this work by analyzing further ways to improve the robustness of our algorithm, and applying it to the domain of Natural Language Processing.
- **Human Cyberphysical Systems:** The previous topics discussed are intertwined to the development of Human Cyberphysical Systems as robotic learning and safety are essential in these domains. I have done work that utilizes optimization techniques to solve challenging problems in the context of transportation networks. Previously I have investigated how different incentives can be used to promote safe and efficient transportation in the face of the COVID-19 pandemic [5]. In a recent work, I look at bi-modal delivery systems utilizing drones [2], where the next step is to extend the setting to dynamical systems and utilize modern RL techniques to derive the routing schedules efficiently.

HONORS & AWARDS

- **2018-19 & 2021-2022 Outstanding Teaching Assistant Award:** Received by the ECE department.
- **Stony Brook University - Magna Cum Laude:** Graduating with an overall GPA of 3.84 in 2017.

REFEREED CONFERENCE PUBLICATIONS

1. **M Beliaev***, A Shih*, S Ermon, D Sadigh, R Pedarsani. "Imitation Learning by Estimating Expertise of Demonstrators", 39th International Conference on Machine Learning (ICML-2022), July. 2022.; doi:arXiv:2202.01288.
2. **M Beliaev**, N Mehr, R Pedarsani. "Congestion-aware Bi-modal Delivery Systems Utilizing Drones", European Control Conference Proceedings 2022 (ECC-2022), June. 2022.; doi: arXiv:2104.04664.
3. **M Beliaev**, P Delgosha, H Hassani, R Pedarsani. "Efficient and Robust Classification Under Sparse Attacks", IEEE International Symposium on Information Theory (ISIT-2022), June. 2022.; doi:arXiv:2201.09369.
4. WZ Wang*, **M Beliaev***, E Biyik*, DA Lazar, R Pedarsani, D Sadigh (*equal contribution). *Emergent Prosociality in Multi-Agent Games Through Gifting*, 30th International Joint Conference on Artificial Intelligence (IJCAI-21), Montreal, Quebec, Canada, Aug. 2021.; doi:10.24963/ijcai.2021/61.
5. **M Beliaev**, E Biyik, DA Lazar, WZ Wang, D Sadigh, R Pedarsani. "Incentivizing Routing Choices for Safe and Efficient Transportation in the Face of the COVID-19 Pandemic", 12th ACM/IEEE International Conference on Cyber-Physical Systems (ICCPs), Nashville, Tennessee, USA, May 2021; doi: 10.1145/3450267.3450546.

WORKSHOP PROCEEDINGS

6. **M Beliaev***, WZ Wang*, DA Lazar, E Bıyık, D Sadigh, R Pedarsani (*equal contribution). “Emergent Correlated Equilibrium through Synchronized Exploration”, RSS 2020 Workshop on Emergent Behaviors in Human-Robot Systems, Corvallis, Oregon, USA, Jul. 2020.

TEACHING EXPERIENCE

- **University of California Santa Barbara** Santa Barbara, CA
 - Teaching Assistant* *Fall 2018, Winter 2019, Spring 2019, Winter 2020, Spring 2020, Spring 2021*
 - **ECE 194E (Spring 2021, 2022):**
Machine Learning: A Probabilistic Perspective
Designing labs for PyTorch, holding office hours, grading homeworks and labs
 - **ECE 235 (Fall 2019, 2020, 2021):**
Stochastic Processes in Engineering
Grading homeworks and exams.
 - **ECE 283 (Spring 2020):**
Machine Learning: A Signal Processing Perspective
Holding office hours, grading homeworks and labs.
 - **ECE 130B (Winter 2019, 2020):**
Signal Analysis and Processing
Holding office hours and sections, grading homeworks, exams, and labs.
 - **ECE 160 (Spring 2019):**
Multimedia Systems
Holding office hours and labs, grading homeworks, exams, and labs.
 - **ECE 10A (Fall 2018):**
Foundations of Analog and Digital Circuits and Systems
Holding office hours and labs, grading homeworks, exams, and labs.

TALKS & POSTER PRESENTATIONS

- International Control Conference on Cyber-Physical Systems 2021 (ICCPS),
Incentivizing Routing Choices for Safe and Efficient Transportation in the Face of the COVID-19 Pandemic, oral presentation

COMPUTER SKILLS

Python, PyTorch, TensorFlow, MATLAB, C++, L^AT_EX