# Mark Beliaev

mbeliaev@ucsb.edu
https://markbeliaev.com/

## Research Interests

My research experience lies broadly in machine learning, encompassing topics such as Reinforcement Learning [1, 2, 7, 8], Adversarial Machine Learning [9, 3], Game Theory [4], and Transportation Systems [5, 10, 6]. I am interested in developing learning algorithms that effectively utilize data from diverse sources.

## Education

- **University of California Santa Barbara** — Santa Barbara, CA
  *PhD Candidate in Electrical and Computer Engineering* — *Jun 2020 – Present*
  *Advisor: Prof. Ramtin Pedarsani* — *Expected Graduation Fall 2024*

- **University of California Santa Barbara** — Santa Barbara, CA
  *Master of Science in Electrical and Computer Engineering GPA: 4.00/4.00* — *Sep 2018 – Jun 2020*

- **Stony Brook University** — Stony Brook, NY
  *Bachelor of Engineering in Electrical Engineering* — *Aug 2013 – Jun 2017*
  *Bachelor of Engineering in Applied Mathematics and Statistics GPA: 3.84/4.00*

## Honors & Awards

- **Graduate Division Dissertation Fellowship (2024)**: Awarded by the ECE department at UCSB.
- **Outstanding Teaching Assistant Award (2018,2021)**: Awarded by the ECE department at UCSB.
- **Magna Cum Laude (2017)**: Graduated Stony Brook University with an overall GPA of 3.84.
- **University Scholar (2013)**: Enrolled into the 4-year scholar program at Stony Brook University.

## Refereed Conference & Journal Publications

[1] Woodrow Z. Wang*, Mark Beliaev*, Erdem Biyik*, Daniel A. Lazar, Ramtin Pedarsani, and Dorsa Sadigh. "Emergent Prosociality in Multi-Agent Games Through Gifting". In: *30th International Joint Conference on Artificial Intelligence (IJCAI)*. Aug 2021. DOI: 10.24963/ijcai.2021/61.

[2] Mark Beliaev*, Andy Shih*, Stefano Ermon, Dorsa Sadigh, and Ramtin Pedarsani. "Imitation Learning by Estimating Expertise of Demonstrators". In: *39th International Conference on Machine Learning (ICML)*. July 2022. URL: https://proceedings.mlr.press/v162/beliaev22a.

[3] Mark Beliaev, Payam Delgosha, Hamed Hassani, and Ramtin Pedarsani. "Efficient and Robust Classification for Sparse Attacks". In: *IEEE Journal on Selected Areas in Information Theory* 5 (May 2024), pp. 261–272. DOI: 10.1109/JSAIT.2024.3397187.

[4] Mark Beliaev, Negar Mehr, and Ramtin Pedarsani. "Pricing for multi-modal pickup and delivery problems with heterogeneous users". In: *Transportation Research Part C: Emerging Technologies* 169 (Dec 2024), p. 104864. ISSN: 0968-090X. DOI: https://doi.org/10.1016/j.trc.2024.104864.

[5] Mark Beliaev, Erdem Biyik, Daniel A. Lazar, Woodrow Z. Wang, Dorsa Sadigh, and Ramtin Pedarsani. "Incentivizing Routing Choices for Safe and Efficient Transportation in the Face of the COVID-19 Pandemic". In: *12th ACM/IEEE International Conference on Cyber-Physical Systems (ICCPS)*. May 2021. DOI: 10.1145/3450267.3450546.

[6] Mark Beliaev, Negar Mehr, and Ramtin Pedarsani. "Congestion-Aware Bi-Modal Delivery Systems Utilizing Drones". In: *Future Transportation* 3.1 (March 2023), pp. 329–348. ISSN: 2673-7590. DOI: 10.3390/futuretransp3010020.

## Conference Versions, Workshop Proceedings & Preprints

[7] Mark Beliaev*, Woodrow Z. Wang*, Daniel A. Lazar, Erdem Bıyık, Dorsa Sadigh, and Ramtin Pedarsani. "Emergent Correlated Equilibrium through Synchronized Exploration". In: *RSS 2020 Workshop on Emergent Behaviors in Human-Robot Systems*. July 2020. URL: https://iliad.stanford.edu/pdfs/publications/beliaev2020emergent.pdf.

[8] Mark Beliaev and Ramtin Pedarsani. *Inverse Reinforcement Learning by Estimating Expertise of Demonstrators*. Feb 2024. arXiv: 2402.01886 [cs.LG].

[9] Mark Beliaev, Payam Delgosha, Hamed Hassani, and Ramtin Pedarsani. "Efficient and Robust Classification for Sparse Attacks". In: *2022 IEEE International Symposium on Information Theory (ISIT)*. June 2022, pp. 3150–3155. DOI: 10.1109/ISIT50566.2022.9834832.

[10] Mark Beliaev, Negar Mehr, and Ramtin Pedarsani. "Congestion-aware Bi-modal Delivery Systems Utilizing Drones". In: *2022 European Control Conference (ECC)*. July 2022, pp. 1944–1951. DOI: 10.23919/ECC55457.2022.9838052.

## Internships & Work Experience

**TikTok** — San Jose, CA
*Machine Learning Engineer Intern* — *Jun 2024 – Sep 2024*

Contributed improvements to the recommendation model. Successfully completed an internship project investigating the performance of GPT-4o as a vision-language classifier, providing insightful and actionable results to the company, and drafting a workshop paper to be submitted for peer-review.

**Stony Brook University** — Stony Brook, NY
*Intern at Experimental Neuro-Rehab Lab* — *Sep 2015 – Apr 2016*

Collaborated in an inter-disciplinary lab led by Prithvi Shah, PhD. Helped in general lab procedures, as well as building tools used for EMS stimulation.

**Phihong** — Bohemia, NY
*Electrical Engineer Intern* — *Nov 2014 – May 2015*

Helped the Research & Design Lab with diagnosing PoE devices.

## Teaching & Mentoring Experience

**University of California Santa Barbara** — Santa Barbara, CA
*Student Mentor* — *Sep 2022 – Jun 2023*
Mentored undergraduate students' research projects related to NLP and adversarial machine learning.

**University of California Santa Barbara** — Santa Barbara, CA
*Teaching Assistant* — *Sep 2018 – Dec 2022*
Taught courses in Machine Learning (ECE 194E, ECE 283), Advanced Probability Theory (ECE 235), Signal Processing (ECE 130B, ECE 160) and Circuits (ECE 10A). Designed lab material for an undergraduate Machine Learning class (ECE 194E).

**University of California Santa Barbara** — Santa Barbara, CA
*Private Tutor* — *Jan 2019 – Dec 2020*
Provided hourly tutoring to undergraduate students for the Campus Learning Assistance Services program.

## Technical Skills

- **Computer Languages**: Python, Matlab, C++, SQL
- **Deep Learning Frameworks**: PyTorch, Tensorflow, OpenAI Gym, RLlib, Stable-Baselines, Pandas, NumPy