Mark Beliaev

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Research Experience

My research interests lie in developing Reinforcement Learning (RL) methods that enhance Large Language Models (LLMs) and Foundation Models for complex real-world tasks. My experience spans RL [1, 4, 6, 10], adversarial ML [2, 8], multi-agent systems [3, 9, 5], and hands-on LLM-based solutions in industry [7].

Education

- **University of California Santa Barbara** — Santa Barbara, CA
  PhD in Electrical and Computer Engineering — *Jun 2020 – Dec 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 & Applied Mathematics and Statistics — *Aug 2013 – Jun 2017*

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] Mark Beliaev and Ramtin Pedarsani. "Inverse Reinforcement Learning by Estimating Expertise of Demonstrators". In: *AAAI Conference on Artificial Intelligence*. 2025. URL: https://arxiv.org/abs/2402.01886.

[2] 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* (2024). DOI: 10.1109/JSAIT.2024.3397187.

[3] 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* (2024). DOI: https://doi.org/10.1016/j.trc.2024.104864.

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

[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: *ACM/IEEE International Conference on Cyber-Physical Systems*. 2021. DOI: 10.1145/3450267.3450546.

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

Conference Versions & Workshop Proceedings

[7] Mark Beliaev, Victor Yang, Madhura Raju, Jiachen Sun, and Xinghai Hu. "Optimizing GPT for Video Understanding". In: *ICLR Workshop on Deep Generative Model in Machine Learning: Theory, Principle and Efficacy*. 2025. URL: https://arxiv.org/abs/2502.09573.

[8] Mark Beliaev, Payam Delgosha, Hamed Hassani, and Ramtin Pedarsani. "Efficient and Robust Classification for Sparse Attacks". In: *IEEE International Symposium on Information Theory*. 2022. DOI: 10.1109/ISIT50566.2022.9834832.

[9] Mark Beliaev, Negar Mehr, and Ramtin Pedarsani. "Congestion-aware Bi-modal Delivery Systems Utilizing Drones". In: *ECC European Control Conference*. 2022. DOI: 10.23919/ECC55457.2022.9838052.

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

Internships & Work Experience

- **TikTok** — San Jose, CA
  Machine Learning Engineer Intern — *Jun 2024 – Sep 2024*
  Contributed to the recommendation engine by implementing new training methods for production ML models and combining model outputs at inference, resulting in higher precision and manageable recall trade-offs. Additionally, led a research project evaluating GPT-4o and Gemini for multi-modal classification, producing actionable insights to the company. This work culminated in a workshop paper accepted at ICLR 2025.

- **Stony Brook University** — Stony Brook, NY
  Intern at Experimental Neuro-Rehab Lab — *Sep 2015 – Apr 2016*
  Collaborated in an interdisciplinary environment to develop and test tools for electrical muscle stimulation (EMS), working closely with engineering and neuroscience teams.

- **Phihong** — Bohemia, NY
  Electrical Engineer Intern — *Nov 2014 – May 2015*
  Supported the Research & Design Lab by diagnosing and troubleshooting PoE (Power over Ethernet) devices.

Teaching & Mentoring Experience

- **University of California Santa Barbara** — Santa Barbara, CA
  Student Mentor — *Sep 2022 – Jun 2023*
  Mentored undergraduates conducting NLP research on adversarial training of LLMs, providing guidance in experiment design, data pipelines, and model evaluation.

- **University of California Santa Barbara** — Santa Barbara, CA
  Teaching Assistant — *Sep 2018 – Dec 2022*
  Taught courses including Machine Learning (ECE 186, ECE 283), Advanced Probability Theory (ECE 235), and Signal Processing (ECE 130B, ECE 160). Created lab materials for a new undergraduate Machine Learning course (ECE 186), emphasizing project-based learning and fundamental pattern recognition concepts.

- **University of California Santa Barbara** — Santa Barbara, CA
  Private Tutor — *Jan 2019 – Dec 2020*
  Provided one-on-one tutoring through the Campus Learning Assistance Services program.

Technical Skills

- **Languages**: Python, Matlab, C++, SQL
- **Deep Learning, RL & Data Tools**: PyTorch, TensorFlow, Docker, Apache Spark, Hugging Face, TRL, Gym, Stable-Baselines, RLlib, Ray, Scikit-learn, W&B, hydra, NumPy, Pandas