Sylee Beltiukov

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Research Interests

My current research lies at the intersection of networking and machine learning, especially network transformers and foundations models. I am interested in developing credible ML-based artifacts and data representations for different networking and security problems, and democratizing network research by creating public measurement infrastructures, datasets, and tools.

Education

University of California, Santa Barbara **Expected: June 2026**

Doctor of Philosophy (Ph.D.), Computer Science

Advisor: Arpit Gupta.

I have been working on democratizing networking research in the era of AI/ML and developing credible ML artifacts for networking problems.Specifically, I have been working on fundamentally redesigning the ML pipeline for networking, enabling the development of credible and explainable ML models, diverse and representative network infrastructures to collect data from, and creating large foundation models for network traffic.

Peter the Great St.Petersburg Polytechnic University **August 2019**

Master of Science (M.S.), Computer Science

Peter the Great St.Petersburg Polytechnic University **August 2017**

Bachelor of Science (B.S.), Computer Science

Professional Experience

Software Engineering Intern **June 2025 – September 2025**

Google *Mountain View, California*

- Worked on developing and advancing various foundation models in Payments.
- Advanced the fraud prediction framework for Payments Risk team using developed foundation models.

Graduate Research Assistant **January 2021 – Present**

University of California Santa Barbara *Santa Barbara, California*

- Developed a high-quality pretrained transformer model working with network traffic data, *netFound* [2], that produces high-quality embeddings for different network tasks.
- Developed a novel data-collection tool, *netUnicorn* [4], that simplifies (iteratively) curating high-quality data for different learning problems from diverse network environments.
- Created a university-based network measurements infrastructure, *PINOT* [3], that allows the collection of representative networking datasets from a real-world environment.
- Developed a model analysis tool, *Trustee* [5] to identify underspecification issues in existing black box ML models.

Student Researcher **June 2024 – September 2024**

Google *Sunnyvale, California*

- Developed an LLM-based approach for system logs analysis for hundreds of thousands of network devices in the Google production network deployed in production.
- Proposed further research directions based on syslog analysis, including false positives identification, logs clusterization, and multi-step failure prediction.

On-Device Machine Learning Researcher **March 2020 – September 2021**

Manpower Group *St.Petersburg, Russia*

- Developed and implemented a solution for the optimization of communication paths between smartphones and cloud services, that was deployed for pilot testing.
- Created a forward erasure correction code for data loss prevention optimized for mobile traffic and networks.
- Researched different congestion control protocols, such as BBR and internal company alternatives.
- Researched on-device ML model optimization and inference.

Junior Reinforcement Learning Researcher **October 2019 – June 2020**
JetBrains Research *St.Petersburg, Russia*

- Reproduced and adapted several approaches to domain-specific tasks.
- Researched how to improve the usage of the Prioritized Experience Replay for World Models.

Selected Publications

[1] **Beltiukov, Roman**, Satyandra Guthula, Wenbo Guo, Walter Willinger, and Arpit Gupta. Demystifying network foundation models. Advances in neural information processing systems (NeurIPS), 2025.

[2] Satyandra Guthula, **Roman Beltiukov**, Navya Battula, Wenbo Guo, and Arpit Gupta. netFound: Foundation Model for Network Security, 2024.

[3] **Beltiukov, Roman**, Sanjay Chandrasekaran, Arpit Gupta, and Walter Willinger. Pinot: Programmable infrastructure for networking. In Proceedings of the Applied Networking Research Workshop, pages 51–53, 2023.

[4] **Beltiukov, Roman**, Wenbo Guo, Arpit Gupta, and Walter Willinger. In Search of NetUnicorn: A Data-Collection Platform to Develop Generalizable ML Models for Network Security Problems. In Proceedings of the 2023 ACM SIGSAC Conference on Computer and Communications Security, CCS '23, page 2217–2231, New York, NY, USA, 2023. Association for Computing Machinery.

[5] A. S. Jacobs, **R. Beltiukov**, W. Willinger, R. A. Ferreira, A. Gupta, and L. Z. Granville. Ai/ml and network security: The emperor has no clothes. In ACM CCS, LA, USA, 2022.

Honors & Awards

***Best Paper Honorable Mention**, IETF Applied Networking Prize*	*2023*
***Winner**, UCSB CS Department Summer Fellowship Award*	*2023*
***Finalist**, Junction Hackathon, "Mobility Track", QOCO*	*2018*
***Track Winner**, World IT Planet championship, Cloud Computing Track by Huawei*	*2018*
***Special Award**, Institute of Bioinformatics, EPAM Systems*	*2018*
***Track Winner**, World IT Planet championship, Cloud Computing Track by Huawei*	*2017*
***Challenge winner**, Junction Hackathon, "Robots and Learning Machines track", Eficode*	*2017*

Technical Skills

Machine Learning	Classic Machine Learning, Time Series, Deep Learning, Explainable AI, PyTorch, Reinforcement Learning
Programming	Python, Rust, SQL, C/C++, LaTeX
Other	Computer Networks, Clouds (Azure, AWS, GCP), Docker, Linux (Debian-based) systems, Virtual Machines (Hyper-V, Xen), Databases, Spark, Git

Volunteering

Virtual Reality club, UC Santa Barbara
Club president, events organization and moderation, public outreach.