

Umid Suleymanov

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Summary

I am a second-year PhD student in Computer Science at Virginia Tech. My research focuses on Trustworthy Machine Learning, specifically investigating LLM Security (jailbreak attacks/defenses), Privacy (membership inference, unlearning), and Few-Shot Learning for Network Intrusion Detection. Previously, I was a Data Science Intern at Amazon (AWS) working on proactive security. I was also a two-time finalist at the International Data Analysis Olympiads, obtaining 16th place among 2187 teams. I have 4.5 years of industry experience building production machine learning, NLP systems, including full deployment and optimization of large-scale predictive models.

Education

Virginia Tech, Blacksburg, VA — <i>PhD in Computer Science</i>	2024 – 2027 (Expected)
Advisor: Murat Kantarcioglu, <i>GPA: 4.0/4.0</i>	
Coursework: Advancad Data and Information Engineering, AI for Software Engineering, Information Visualization	
Khazar University, Baku, Azerbaijan — <i>Master of Science in Computer Science</i>	2019 – 2021
Advisor: Amir Rahmani, <i>GPA: 4.0/4.0</i>	
Coursework: Machine Learning, Distributed systems, Software Engineering	
ADA University, Baku, Azerbaijan — <i>Bachelor of Science in Computer Science</i>	2013 – 2018
Advisor: Samir Rustamov, <i>Cum Laude, GPA: 3.72/ 4.0</i>	
Coursework: Linear Algebra, Artificial Intelligence, Machine Learning, Data Mining and Decision Support	

Professional Experience

Data Science Intern, Amazon (AWS Proactive Security)	May 2025 – Aug 2025
• Developed statistical and ML models and performed analysis to process large-scale security data.	
• Built ETL pipelines, dashboards, and metrics to deliver actionable insights using Python, SQL, and AWS tools.	
Graduate Research Assistant, Virginia Tech	Aug 2024 – May 2025, Aug 2025 – Present
• Published research on few-shot learning for Network Intrusion Detection, outperforming current models by 3.5%.	
• Developed policy-grounded RAG-based agentic defenses for detecting and mitigating LLM jailbreak attacks, surpassing state-of-the-art detection methods by 4%.	
• Conducting research on LLM privacy leakage, including membership inference and memorization analysis; designed agent-based reflective defenses that reduced privacy leakage by 35%.	
Instructor of Computer and Information Sciences, ADA University	Jan 2023 – Aug 2024
• Instructed courses on Intro to Big Data Engineering, Deep Learning, and Data & Information Engineering; designed comprehensive syllabi, instructional materials, and assessments using Blackboard LMS.	
• Conducted research at the Center for Data Analytics and Research, focusing on pre-training and efficient fine-tuning of Large Language Models (LLMs) for low-resource languages and Explainable AI (XAI)	
Leading Data Scientist, E-Gov Development Center	Jun 2022 – Jan 2023
• Led the design and deployment of end-to-end ML pipelines, integrating predictive models into production systems.	
• Developed pretrained language models and word embeddings for the Azerbaijani language, achieving a 4.3% performance improvement on downstream NLP tasks.	
• Built custom Elasticsearch text analyzers to enhance search relevance, which increased click-through rates by 6%.	
Senior Data Scientist, E-Gov Development Center	Nov 2019 – Jun 2022
• Built an automated document anonymization pipeline using custom Named Entity Recognition (NER), accelerating manual processing speed by 32%.	
• Designed predictive models to forecast customer wait times and optimize queue management, reducing related complaints by 16%.	
Data Engineer, E-Gov Development Center	Jul 2018 – Nov 2019
• Optimized data reliability and quality for large-scale queue and NLP datasets; implemented robust data acquisition, preprocessing, transformation, and storage routines.	
• Gathered complex business requirements and successfully translated them into actionable data science strategies.	

- Developed automated text classification systems for news article analysis, utilizing Machine Learning and Deep Learning algorithms; Published research findings on automated news classification in the IEEE AICT Conference.

Publications

- [1] **U. Suleymanov**, et al. “SSPNet: Semi-Supervised Prototypical Networks for Few-Shot Network Intrusion Detection.” *IEEE Military Communications Conference (MILCOM)*, 2025.
- [2] A. Asgarov, **U. Suleymanov**, A. Khatri. “SIGMA: Search-Augmented On-Demand Knowledge Integration for Agentic Mathematical Reasoning.” *AAAI Conference on Artificial Intelligence (AAAI) LMReasoning* , 2026.
- [3] L. Aliyeva, N. Abdullayev, **U. Suleymanov**, et al. “Deep Unlearning of Breast Cancer Histopathological Images for Enhanced Responsibility.” *IEEE International Conference on Application of Information and Communication Technologies (AICT)*, 2024.
- [4] T. Alizada, **U. Suleymanov**, Z. Rustamov. “Contextualized Word Embeddings for Azerbaijani.” *IEEE International Conference on Application of Information and Communication Technologies (AICT)*, 2024.
- [5] **U. Suleymanov**, V. Huseynov, et al. “Instance Segmentation of Handwritten Text on Historical Document Images Using Deep Learning Approaches.” *International Conference on Artificial Intelligence and Applied Mathematics in Engineering (ICAIAME)*, 2022.
- [6] **U. Suleymanov**, B. K. Kalejahi, E. Amrahov, R. Badirkhanli. “Text Classification for Azerbaijani Language Using Machine Learning.” *Computer Systems Science and Engineering*, 35(6), 467–475, 2020.
- [7] S. Mammadli, S. Huseynov, H. Alkaramov, U. Jafarli, **U. Suleymanov**. “Sentiment Polarity Detection in Azerbaijani Social News Articles.” *Proceedings of the International Conference on Recent Advances in Natural Language Processing (RANLP)*, 2019.
- [8] **U. Suleymanov**, S. Rustamov, et al. “Empirical Study of Online News Classification Using Machine Learning Approaches.” *IEEE 12th International Conference on Application of Information and Communication Technologies (AICT)*, 2018.
- [9] **U. Suleymanov**, S. Rustamov. “Automated News Categorization using Machine Learning methods.” *IOP Conference Series: Materials Science and Engineering*, 459(1), 2018.

Invited Talks & Academic Service

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| • Reviewer, ACM Transactions on Privacy and Security; AICT 2025 Conference; AICT 2024 Conference. | |
| • Speaker, “Large Language Models: Reasoning and Security”, Data, ERP and AI Summit. | Oct 2025 |
| • Speaker, “Artificial Intelligence and its Implications for Accessibility”, Elevate & Innovate, Azercell | May 2023 |
| • Speaker, “Machine Learning and its Applications,” Azerbaijan Engineers Union | Mar 2023 |
| • Judge (CS Domain), Intel International Science and Engineering Fair (ISEF) Local Selection | Feb 2023 |
| • Judge, Bilim Baku Science Fair | Sep 2022 |
| • Tutorial, “Intermediate Machine Learning,” Kaggle 30 Days of ML, Google Developers Group Baku | Aug 2021 |
| • Tutorial, “Applications of ML in Public Services,” AI4DIGIGOV | Apr 2021 |

Technical Skills

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| • TensorFlow, PyTorch, Keras, Transformers, vLLM | • Few-shot & semi-supervised learning, NLP, LLMs |
| • Spark, BigQuery, AWS S3/SageMaker, ETL pipelines | • Matplotlib, Seaborn, Plotly, Dash, Tableau, Power BI |
| • Supervised & unsupervised learning | • Docker, Git, version control, CI/CD basics |

Honors & Achievements

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| • Finalist at International Data Analysis Olympiad | • Instructor at 30 Days of ML — Kaggle, Google (2021) |
| • TensorFlow Developer Certificate | • 8+ peer-reviewed papers in AI/ML |
| • First Place, AzInTelecom Hackathon | • Honorable Mention, ACM ICPC Contest |