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, — ***PhD in Computer Science*** 2024 – 2027 (Expected)
Advisor: Murat Kantarcioglu, *GPA: 4.0/4.0*
Coursework: Advancad Data and Information Engineering, AI for Software Engineering, Information Visualization

Khazar University, Baku, Azerbaijan — ***Master of Science in Computer Science*** 2019 – 2021
Advisor: Amir Rahmani, *GPA: 4.0/4.0*
Coursework: Machine Learning, Distributed systems, Software Engineering

ADA University, Baku, Azerbaijan — ***Bachelor of Science in Computer Science*** 2013 – 2018
Advisor: Samir Rustamov, *Cum Laude, GPA: 3.72/ 4.0*
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.

Research Assistant, Center for Data Analytics Research Dec 2017 – May 2018

- 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

- **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

- TensorFlow, PyTorch, Keras, Transformers, vLLM
- Spark, BigQuery, AWS S3/SageMaker, ETL pipelines
- Supervised & unsupervised learning
- Few-shot & semi-supervised learning, NLP, LLMs
- Matplotlib, Seaborn, Plotly, Dash, Tableau, Power BI
- Linux, Docker, Git, version control, CI/CD
- Scikit-learn, spaCy, LangChain, HuggingFace
- SQL, anomaly detection, clustering, A/B Testing

Honors & Achievements

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