Ali Asgarov

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Research Interests

I work in the areas of computer vision and natural language processing, with a primary focus on multimodal learning and vision-language models. My research interests include:

- Reasoning in vision-language models
- Cross-modal retrieval across images, text, video, and audio
- Structured information extraction from multimodal data

Education

▶ **Virginia Tech, PhD in Computer Science, GPA: 4.0/4.0** *Aug 2024 – Present*
- **Advisor**: Dr. Chris Thomas
- **Coursework:** Multimodal Vision, Natural Language Processing, Statistics in Research

▶ **George Washington University, MSc in Computer Science, GPA: 3.76/4.0** *Aug 2022 – Dec 2023*
- **Advisor**: Dr.Rebecca Hwa & Dr.Samir Rustamov
- **Coursework:** Machine Learning, Neural Networks & Deep Learning, Cloud Computing, Artificial Intelligence, Big Data & Analytics, Database Management Systems, Advanced Software Paradigms, Computer System Architecture, Design & Analysis of Algorithms

▶ **Baku Higher Oil School, BEng in Automation, GPA: 91/100** *Aug 2017 – May 2022*
- **Advisor**: Dr.Ali Parsayan
- **Coursework:** Calculus I , Calculus II, Calculus III, Numerical Methods, Algorithms and Data Structures I, Algorithms and Data Structures II, Algorithms and Data Structures III, Image Pattern Recognition

Experience

▶ **Machine Learning Engineer, Polygraf AI, Texas, US** *Dec 2023 – Aug 2024*
- Achieved a **92% F1** score detecting AI-generated content via fine tuning transformer based language models on AWS SageMaker, Lambda, and GCP, while training **multimodal language models** to detect audio, image, and video deepfakes.

▶ **Machine Learning Engineer, Revenue AI, Amsterdam, NL** *Feb 2022 – Aug 2022*
- Improved decision-making processes by deploying machine learning models like **anomaly detection, classification, regression, video summarization** and optimizing data pipelines using Azure services.

▶ **Machine Learning Engineer, Voiceloft AI, Delaware, US** *Jan 2021 – Feb 2022*
- Achieved **93% ASR** accuracy (**23%** higher than Google Translate) by developing models for low-resource languages using PyTorch, Kaldi, collecting diverse data, and fine-tuning for 11 English accents.

Publications

▶ NEST: Narrative Event Structures in Time for Long Video Understanding, Under Review, **ACL ARR 2026**, paper Oct 2025

Ali Asgarov, Kaushik Narasimhan, Najibul Haque Sarker, Shaurya Mallampati, Anushka Sivakumar, Chris Thomas

▶ Benchmarking and Mitigating MCQA Selection Bias of Large Vision-Language Models, Accepted to **EMNLP 2025 (Main Conference)**, paper Sep 2025

MD, Atabuzzaman, Ali Asgarov*, Chris Thomas

**The proposed bias mitigation method was created and implemented by this author*

► SIGMA: Search-Augmented On-Demand Knowledge Integration for Agentic Mathematical Reasoning — Aug 2025

Ali Asgarov, Umid Suleymanov, Aadyant Khatri , Under Review, LMReasoning, **AAAI 2026**, paper

► Advancing Public Safety Video Sensemaking with Ground Robot Footage: A Human-Centered Approach, Under Review, **CHI 2026**, paper — May 2025

Puqi Zhou, Ali Asgarov, Aafiya Hussain, and others.

► ENTER: Event Based Interpretable Reasoning for VideoQA, Accepted to MAR, **NeurIPS 2024**, Spotlight Paper — Oct 2024

Hammad Ayyubi, Junzhang Liu, Ali Asgarov, Zaber Ibn Abdul Hakim, and others.

► LowCLIP: Adapting the CLIP Model Architecture for Low-Resource Languages in Multimodal Image Retrieval Task, Under Review, paper — June 2024

Ali Asgarov, Samir Rustamov

► 3D-CNNs-Based Touchless Human-Machine Interaction, Accepted to **ICR 2023**, Springer, Berlin, paper — Sep 2023

Ali Asgarov, Ali Parsayan

Honors & Awards

2025 Awarded Pratt Fellowship in the Virginia Tech College of Engineering
2023 State Program on Education of Azerbaijani Youth Abroad Scholarship
2022 1st Place (3x), National AI Competition in ML Applications (2020–2022)
2020 Ranked among the top 15 teams at the III World Robot Olympiad in Győr, Hungary
2019 Gold Medal at the III World Robot Olympiad in Azerbaijan
2018 Presidential Scholarship for Exceptional Academic Performance
2017 Scored 690 out of 700 on the University Entrance Exam
2017 High School Graduate with a Gold Medal, placing in the top 0.1% among 90,000 graduating students

Patents

US Patent Application No. 4883-5431-3873 (2024): System and Method for Identifying and Determining a Content Source.

Technologies

Languages: Python, C/C++, **SQL (Postgres)**, JavaScript, HTML/CSS, **R**, **Matlab**, **Scala**

Frameworks: PyTorch, **TensorFlow**, Keras, **FastAPI**, Flask, **Docker**, MLlib, Apache Spark, Apache Hadoop

Cloud Technologies: Amazon Web Services, **Microsoft Azure**, **Google Cloud AI Platform**

Libraries: Hugging Face Transformers, **Sentence Transformers**, **OpenCV**, **Pandas**, **NumPy**, **Scikit-learn**, **NLTK**, **Spacy**, **Plotly**, **Matplotlib**, **Gradio**, Streamlit

Bold = Expert, Underlined = Intermediate.

Miscellaneous

Teaching: CS3114 - Data Structures & Algorithms (Spring 2025), CS5644 - Machine Learning with Big Data (Fall 2024), Virginia Tech.

Reviewing: ACM TIST 2025, EMNLP 2025, WACV 2026.

Languages

English (fluent) **Turkish** (fluent) **Azerbaijani** (native)