

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
- Knowledge representation for multimodal reasoning

Education

Virginia Tech Aug 2024 – Present

PhD in Computer Science

- **GPA:** 4.0/4.0
- **Advisor:** Dr. Chris Thomas
- **Coursework:** Multimodal Vision, Natural Language Processing, Statistics in Research

George Washington University Aug 2022 – Dec 2023

MSc in Computer Science

- **GPA:** 3.76/4.0
- **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 Aug 2017 – May 2022

BEng in Automation Engineering

- **GPA:** 91/100
- **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 Austin, TX

Polygraf AI

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 Amsterdam, NL

Revenue AI

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 Middletown, DE

Voiceloft

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 Oct 2025
Ali Asgarov, Kaushik Narasimhan, Najibul Haque Sarker, Shaurya Mallampati, Anushka Sivakumar, Chris Thomas
Under Review, **ACL ARR 2026**, [paper](#) [↗](#)

- Benchmarking and Mitigating MCQA Selection Bias of Large Vision-Language Models Sep 2025
MD, Atabuzzaman, Ali Asgarov*, Chris Thomas
Accepted to **EMNLP 2025 (Main Conference)**, [paper](#) [↗](#)
**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 , [paper](#) [↗](#)
Under Review, **MATH-AI NeurIPS 2025**

- Advancing Public Safety Video Sensemaking with Ground Robot Footage: A Human-Centered Approach, Puqi Zhou, Ali Asgarov, Aafiya Hussain, and others. May 2025
Under Review, **CHI 2026** [paper](#) [↗](#)

- ENTER: Event Based Interpretable Reasoning for VideoQA Oct 2024
Hammad Ayyubi, Junzhang Liu, Ali Asgarov, Zaber Ibn Abdul Hakim, and others.
Accepted to MAR, NeurIPS 2024, [Spotlight Paper](#) [↗](#)

- LowCLIP: Adapting the CLIP Model Architecture for Low-Resource Languages in Multimodal Image Retrieval Task June 2024
Under Review, [paper](#) [↗](#)
Ali Asgarov, Samir Rustamov

- 3D-CNNs-Based Touchless Human-Machine Interaction Sep 2023
Accepted to **ICR 2023**, Springer, Berlin, [paper](#) [↗](#)
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.

Teaching

2025, Spring CS3114: Data Structures Algorithms, Virginia Tech

2024, Fall CS5644: Machine Learning with Big Data, Virginia Tech

Languages

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