

# Ali Asgarov

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🎓 Ali Asgarov    🌐 aliasgerovs.github.io

## Research Interests

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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

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**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

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**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

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- 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**
  
- 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  
Under Review, **MATHAI NeurIPS 2025**
  
- Advancing Public Safety Video Sensemaking with Ground Robot Footage: A Human-Centered Approach, Multimodal Algorithmic Reasoning Workshop, Puqi Zhou, May 2025  
Ali Asgarov, Aafiya Hussain, and others.  
Under Review, **CHI 2026**
  
- 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

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- 2025** Awarded Pratt Fellowship in the Virginia Tech College of Engineering
- 2022** State Program on Education of Azerbaijani Youth Abroad Scholarship
- 2022** 1<sup>st</sup> 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

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

## Technologies

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**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

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**2025, Spring** CS3114: Data Structures Algorithms, Virginia Tech

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

## Languages

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