

# Ali Asgarov

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## RESEARCH INTERESTS

I work on computer vision and natural language processing with a focus on multimodal learning, including vision-language reasoning, cross-modal retrieval, and structured information extraction.

## EDUCATION

### Virginia Tech, PhD in Computer Science, GPA: 4.0/4.0

Advisor: Dr. Chris Thomas

Coursework: Multimodal Vision, Natural Language Processing, Statistics in Research.

Aug 2024 – Present

Blacksburg, VA

### George Washington University, MSc in Computer Science, GPA: 3.76/4.0

Advisors: Dr. Rebecca Hwa and Dr. Samir Rustamov

Coursework: Machine Learning, Neural Networks and Deep Learning, Cloud Computing, AI, Big Data and Analytics.

Aug 2022 – Dec 2023

Washington, DC

### Baku Higher Oil School, BEng in Automation, GPA: 91/100

Advisor: Dr. Ali Parsayan

Coursework: Calculus I–III, Numerical Methods, Algorithms and Data Structures I–III, Image Pattern Recognition.

Aug 2017 – May 2022

Baku, Azerbaijan

## EXPERIENCE

### Machine Learning Engineer, Polygraf AI

Texas, USA / Dec 2023 – Aug 2024

Built multimodal deepfake detection models for text, image, audio, and video by fine-tuning transformer-based models using PEFT methods (LoRA, QLoRA, prompt tuning). Achieved 92% F1 with 97% recall on high-risk content through improved data and evaluation pipelines. Deployed <100 ms inference on SageMaker, Lambda, and Vertex AI, serving 25k users.

### Machine Learning Engineer, Revenue AI

Amsterdam, Netherlands / Feb 2022 – Aug 2022

Built ML models and data pipelines for anomaly detection, classification, forecasting, and video summarization on Azure ML and Synapse. Improved data ingestion and processing latency from 1 hour to <10 minutes and automated monitoring and retraining to keep models up to date. Led delivery of ML solutions and pipelines for partners including PepsiCo, P&G, and MuSigma.

### Machine Learning Engineer, Voiceloft AI

Delaware, USA / Jan 2021 – Feb 2022

Developed multilingual ASR models for low-resource English accents using PyTorch and Kaldi, leveraging Kaldi for data preparation and alignment and PyTorch for model training. Fine-tuned wav2vec 2.0 and XLS-R to achieve 93% accuracy (23% above baseline benchmarks). Deployed robust ASR models on Kubernetes with autoscaling and monitoring, supporting 30k users at 99.8% uptime.

## PUBLICATIONS

### NEST Narrative Event Structures in Time for Long Video Understanding

Oct 2025

A. Asgarov, K. Narasimhan, N.H. Sarker, S. Mallampati, A. Sivakumar, C. Thomas | Under Review, ACL ARR 2026 paper ↗

### Benchmarking and Mitigating MCQA Selection Bias of Large Vision Language Models

Sep 2025

M. Atabuzzaman, A. Asgarov, C. Thomas | Accepted, EMNLP 2025 Main paper ↗

### SIGMA Search Augmented On Demand Knowledge Integration for Agentic Mathematical Reasoning

Aug 2025

A. Asgarov, U. Suleymanov, A. Khatri | Accepted, AAAI 2026 LMReasoning paper ↗

### Advancing Public Safety Video Sensemaking with Ground Robot Footage

May 2025

P. Zhou, A. Asgarov, A. Hussain et al. | Under Review, CHI 2026 paper ↗

### ENTER Event Based Interpretable Reasoning for VideoQA

Oct 2024

H. Ayyubi, J. Liu, A. Asgarov, Z.I.A. Hakim et al. | Spotlight, NeurIPS 2024 MAR paper ↗

### LowCLIP Adapting CLIP for Low Resource Languages in Image Retrieval

June 2024

A. Asgarov, S. Rustamov | Under Review paper ↗

### 3D CNNs Based Touchless Human Machine Interaction

Sep 2023

A. Asgarov, A. Parsayan | ICR 2023, Springer paper ↗

## TECHNICAL SKILLS

**Languages:** Python, C/ C++, SQL, JavaScript, R, MATLAB

**Libraries:** HuggingFace, OpenCV, Pandas, NumPy,

Scikit-learn, NLTK, SpaCy

**Frameworks:** PyTorch, TensorFlow, FastAPI, Docker, Spark, Hadoop

**Cloud:** AWS, Azure, GCP

**Systems:** Linux, Windows

## PATENTS

US Patent App. 4883 5431 3873 2024 ↗ System and Method for Identifying and Determining a Content Source.

## SERVICE, TEACHING & LANGUAGES

**Teaching:** CS3114 Data Structures and Algorithms (Spring 2025) and CS5644 ML with Big Data (Fall 2024)

**Reviewing:** ACM TIST 2025, EMNLP 2025, WACV 2026, CVPR 2026

**Languages:** English (fluent), Turkish (fluent), Azerbaijani (native)

## HONORS AND AWARDS

2025 Pratt Fellowship, Virginia Tech ↗

2023 State Scholarship for Azerbaijani Youth Abroad ↗

2020–2022, 1<sup>st</sup> Place (3×) National AI Competition ↗

2020, Top 15 World Robot Olympiad, Hungary ↗

2019, Gold Medal, National Robot Olympiad, Azerbaijan ↗

2018 Presidential Scholarship ↗

2017 University Entrance Exam 690/700

2017 High School Graduation with Gold Medal (Top 0.1%)