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, Comparison of Learning Algorithms

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

Lead Machine Learning Engineer *Austin, TX*
Polygraf AI *Dec 2023 – Aug 2024*

- Achieved a **92% F1** score in detecting **AI-generated** content and enhanced data governance by fine-tuning advanced NLP models (BERT, RoBERTa, DeBERTa, T5) and deploying production-ready pipelines using AWS SageMaker, Lambda, and GCP services.

Lead 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.

Middle 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

ENTER: Event Based Interpretable Reasoning for VideoQA, Oct 2024

Multimodal Algorithmic Reasoning Workshop, **NeurIPS 2024, Spotlight Paper**

Hammad Ayyubi, Junzhang Liu, **Ali Asgarov**, Zaber Ibn Abdul Hakim, Najibul Haque Sarker, Zhecan James Wang, Chia-Wei Tang, Hani Alomari, Md. Atabuzzaman, Xudong Lin, Naveen Reddy, Shih-Fu Chang, Chris Thomas

paper

LowCLIP: Adapting the CLIP Model Architecture for Low-Resource Languages in Multimodal Image Retrieval Task June 2024

Under Review at **COLING 2025**

Ali Asgarov, Samir Rustamov

paper

3D-CNNs-Based Touchless Human-Machine Interaction Sep 2023

International Conference on Interactive Collaborative Robotics, **ICR 2023**, Springer, Berlin

Ali Asgarov, Ali Parsayan

paper

Honors & Awards

2022 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

Developer Tools: Git, TravisCI, **Google Cloud Platform**, **Compute Engine**, **AWS Sagemaker**, **AWS Lambda, AWS S3**, **GCP Deep Learning**, GCP BigQuery, GCP AI Platform, Eclipse

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

Bold = Expert, Underlined = Intermediate.

Teaching

2024, Fall CS5644: Machine Learning with Big Data, Virginia Tech
2025, Spring CS3114: Data Structures Algorithms, Virginia Tech

Languages

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