ANDREAS AVGOUSTIS

PhD Candidate — Visual Speech Recognition & Multimodal Learning

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RESEARCH PROFILE

PhD candidate working on visual speech recognition for people who have lost their voice after tracheostomy or laryngectomy. My research asks whether a vision-language model, rather than a conventional video classifier, can recognise Greek speech from lip movement alone with enough accuracy to be usable at the bedside. I built the first Greek viseme-level dataset for this population, designed a deterministic preprocessing pipeline that encodes a video segment as a single image a VLM can ingest, and combined parameter-efficient fine-tuning with dense retrieval and a Greek language model as a correction layer. My interests are multimodal representation learning, efficient adaptation of large pretrained models, and evaluation of these systems under the atypical articulation that real patients present.

EDUCATION

PhD in Informatics (in progress)

May 2024 — present

Ionian University, Department of Informatics, Corfu, Greece

- Thesis: *Lip-reading and personalised voice reproduction for patients with impaired speech using vision-language models*
- Supervisor: Prof. Themis Exarchos. Laboratory: BiHELab (Bioinformatics & Human Electrophysiology).
- Thesis language: English.

MSc in Big Data Driven Networked Systems

Oct 2022 — Feb 2024

Ionian University, Department of Informatics, Corfu, Greece

- Grade 9.47 / 10. Thesis on machine learning for healthcare process optimisation (published at AIAI 2024).
- Coursework: big data technologies, advanced data mining and machine learning, stochastic analysis, network systems and security.

BSc in Informatics

Oct 2015 — Feb 2021

Ionian University, Department of Informatics, Corfu, Greece

- Thesis on deep learning for melanoma classification from dermoscopic images (published at SMAP 2021).

RESEARCH EXPERIENCE

Doctoral Researcher — BiHELab, Ionian University

May 2024 — present

Bioinformatics & Human Electrophysiology Laboratory, Corfu, Greece

- Built the first Greek viseme-level video dataset for silent speech after tracheostomy — over 1,000 distinct words recorded across multiple speakers, with ethics approval obtained for the clinical evaluation phase.
- Designed a deterministic preprocessing pipeline — MediaPipe FaceLandmarker for mouth-region localisation, fixed 16-frame temporal sampling, and composition into a 4×4 spatial grid — so that a video segment becomes a single image that an image-only vision-language model can consume.
- Developed a hybrid recognition architecture: a BakLLaVA/LLaVA backbone fine-tuned with 4-bit QLoRA, FAISS dense retrieval over the viseme corpus, and the Greek LLM Krikri as a linguistic correction layer on top of the visual prediction.
- Ran a held-out evaluation on 830 samples: 67.23% top-1 accuracy and 92.94% ROC-AUC. Isolated the dominant failure mode — atypical articulation in post-operative speakers — and made speaker-level adaptation the next objective of the thesis rather than reporting the aggregate figure alone.
- Managed training on cloud GPU infrastructure, including quantised fine-tuning under constrained memory, experiment tracking, and ablation studies isolating the contribution of the retrieval and language-correction components.

PUBLICATIONS

1. **Avgoustis, A.**, Pezoulas, V., Exarchos, T. *Visual Speech Recognition for Enhancing Communication Post-Tracheostomy Patients*. GeNeDis 2026 — World Congress on Genetics, Geriatrics and Neurodegenerative Diseases Research. **Accepted; in press.**
2. Agathos, L., **Avgoustis, A.**, Kryelesi, X., Makridou, A., Tzanis, I., Mouratidis, D., Kermanidis, K. L., Kanavos, A. *Bridging Linguistic Gaps: Developing a Greek Text Simplification Dataset*. Information, 15(8), 500, 2024. doi.org/10.3390/info15080500
3. **Avgoustis, A.**, Exarchos, T., Vrahatis, A. G., Vlamos, P. *Optimization of Healthcare Process Management Using Machine Learning*. Artificial Intelligence Applications and Innovations (AIAI 2024), IFIP AICT vol. 711, Springer, 2024. doi.org/10.1007/978-3-031-63211-2_15
4. Agathos, L., **Avgoustis, A.**, Avgoustis, N., Vlachos, I., Karydis, I., Avlonitis, M. *Identifying Earthquakes in Low Cost Sensor Signals Contaminated with Vehicular Noise*. Applied Sciences, 13(19), 10884, 2023. doi.org/10.3390/app131910884
5. **Avgoustis, A.**, Exarchos, T., Kermanidis, K. L., Mylonas, P. *Applied Deep Learning for Categorizing Dermoscopic Images*. 16th International Workshop on Semantic and Social Media Adaptation & Personalization (SMAP), 1–4, 2021. doi.org/10.1109/SMAP53521.2021.9610798

TECHNICAL SKILLS

Vision & multimodal Vision-language models (LLaVA, BakLLaVA), QLoRA / parameter-efficient fine-tuning, CNNs, 3D-CNN–LSTM, Transformers, MediaPipe FaceLandmarker, OpenCV.

Language & retrieval Retrieval-augmented generation, FAISS dense retrieval, sentence embeddings, Greek LLMs (Krikri), Hugging Face Transformers, PEFT, bitsandbytes.

Frameworks PyTorch, TensorFlow, Keras, scikit-learn, NumPy, pandas, Apache Spark.

Infrastructure Python, SQL, Git, Docker, cloud GPU training (Google Cloud Platform, Microsoft Azure, Colab), Linux.

Also R, PHP, PowerShell, Power BI, Tableau, React, Django.

PROFESSIONAL EXPERIENCE

Adult Education Instructor Apr 2026 — Jun 2026

APOPSI IT, Consulting & Training Services S.A., Corfu, Greece

- Delivered 140 hours of in-person training for the national programme "Digital education and empowerment of older people and persons with disabilities" (MIS 5223341), teaching device use, safe internet navigation, e-government services and online banking at the Open Care Centre for the Elderly (KAPI) of Central Corfu.

Computer Programmer — Compulsory Military Service Dec 2024 — Nov 2025

Research and Informatics Office, 8th Motorized Infantry Brigade, Hellenic Army

- Administered intranet servers, virtualised environments and network infrastructure; automated administrative workflows with PowerShell and Java scripting. Served concurrently with ongoing doctoral research.

Business Intelligence Analyst Feb 2023 — Feb 2024

Association of Educational Caregivers of Corfu, Greece

- Built reporting pipelines and dashboards over web and social engagement data, and designed the organisation's data storage and update process.

Junior Data Analyst Jan 2021 — Jan 2023

Alfa Ekpaideutiki, Corfu, Greece

- Analysed web performance data with SQL and Excel, implemented PHP-based tracking with the development team, and produced recurring analytical reports for management.

ADDITIONAL INFORMATION

Conference presentations Oral presentations at SMAP 2021 (online) and AIAI 2024 (Corfu, Greece).

Teaching support Exam invigilation duties, Department of Informatics, Ionian University (2025–2026).

Languages Greek (native), English (C2).

Certifications Data Engineering, Full-Stack Python Developer, and Business Analyst Career Track — IT & Engineering School.