Antonios Tragoudaras

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Education

University of Amsterdam (UvA) — *Amsterdam, Netherlands*

MSc in Artificial Intelligence (Informatics Institute) — Aug. 2023 - Present

GPA: 8.31/10 (Finished First year) - In track to graduate with cum-laude (highest distinction).

King Abdullah University of Science and Technology (KAUST) — *Jeddah, Saudi Arabia*

Ph.D. Student in Electrical and Computer Engineering — Aug. 2022 - Aug. 2023 (Dropped out)

GPA: N/A, 24 Credits - Doctoral Dissertation Research.

University of Thessaly — *Volos, Greece*

BEng in Electrical & Computer Engineering (5-years studies; 300ECTS) — Sep. 2016 - Nov. 2021

GPA: 7.88/10, Thesis Grade: 10/10, Supervisor: Prof. George Stamoulis.

Research Experience

Generative AI , Learning Physics from Videos — *University of Amsterdam (UvA)*

Research Project led by Associate Professor Efstratios Gavves to create a new real-world dataset, and test the capabilities of text/&image-to-video models (namely world-models) like OpenAI-SORA. Starting from January 2025, I am planning to extend this research project to conduct my MSc AI thesis, and hopefully lead to a high-quality publication in a renowned AI venue (NeurIPS, ICML, etc.). — Jul.2024-Present

Duties/Tasks + Goal:

- Discovering the limitations of SOTA video-generation models.
- Optimizing SOTA generative models capabilities in understanding physics.
- Developing a pipeline for Tracking, and Segmentation (based on DEVA, Grounded SAM) and extending for Depth Estimation to be used on videos generated by world models.
- Goals:
  - Contributing on Open-Sora-Plan.
  - Conduct my MSc AI thesis in the ELLIS Amsterdam MSc Honours Programme.

Visual Perception for Autonomous Vehicles - Brightskies Inc. — *External Collaboration*

Remote Collaboration, monitored by Mahmoud Serour (Autonomous Driving Team Lead) and Mohamed Ezzat (Perception Engineer). Collaboration Initiated by Research Scientist Hakim Ghazzai (AI Team Lead of our research group). — Mar.2023-Jun.2023

Duties/Tasks:

- Main Ph.D. Research Topic: Improving Multi-Task Perception Performance through learning better intermediate representations with the fusion of different sensor modalities (LiDAR, Camera, Radar)

Neural Architecture Search, Meta-Heuristic Optimization, Transformers for brain signal decoding — *King Abdullah University of Science and Technology (KAUST)*

Ph.D. Student, supervised by Postdoc Fellow Charalampos Antoniadis — Sep. 2022 - Feb.2023

Journal Publications:

- Enhancing DNN models for EEG/ECoG BCI with a Novel Data-Driven Offline Optimization Method (IEEE Access)

Paper Publications:

- Data-Driven Offline Optimization of Deep CNN Models for EEG and ECoG Decoding (ISCAS'23)

AutoML, Efficient Deep Learning Techniques, and Voice Activity Detection — *Visiting Student Research Program-KAUST*

Visiting Student Research Intern, mentored by Postdoc Fellow Charalampos Antoniadis — Feb. 2022 - Jul. 2022

Paper Publications:

- TinyML for EEG Decoding on Microcontrollers (ISCAS'23)
- Audio-visual Speaker Diarization: Improved Voice Activity Detection with CNN based Feature Extraction (MWSCAS'22)

Accelerating Inference of Deep Neural Networks on FPGAs *University of Thessaly*

Undergraduate Researcher, mentored by Prof. George Stamoulis and Postdoc Fellow George Floros Jul. 2021 - Jan. 2022

Journal Publication:

- Design Space Exploration of a Sparse MobileNetV2 Using High-Level Synthesis and Sparse Matrix Techniques on FPGAs (MDPI Sensors'22)

Projects & Skills

PyTorch/Python

- Efficient Language to Vision Alignment allowing VLMs to excel in VQA tasks >
- Examining Racial and Gender Biases in Large Language Models Through the Lens of Emotional Analysis >
- Visual prompting for in-context learning with CLIP >
- Developed a hydra DL network with multiple heads (proprietary) to tackle the challenges in autonomous vehicle perception, leveraging the power of multi-task learning >
  Each head of the hydra network corresponds to a different downstream computer vision task
  BEVFusion is used as backbone (Multi-Task Multi-Sensor Fusion with Unified Bird's-Eye View Representation)
- Implemented a small-scale, Transformer-based model (OpenAI's GPT2) for text generation tasks, using pre-trained weights >
- Fundamental Generative Models (Varional Autoncoders, Adversarial AE) for Image Generation
- Multi-Layer Perceptron trained with back-propagation from scratch using (Numpy) & torch >

Tensorflow/Python

- Transformer-based Deep Learning Architecture trained in a data-driven offline fashion along with a meta-heuristic implementation >
- Extended the capabilities of uNAS (an Auto-TinyML framework) >

C/C++

- Main program language taught during undergraduate courses, used for personal and course projects mainly
- Coded C++ kernel/function implementing Depth-wise and Point-wise Convolutions, that was utilized during High-Level Synthesis tool (Xilinx Vitis HLS)

Publications

Full list is available at Google Scholar

[1] **Antonios Tragoudaras**, Charalampos Antoniadis, Yehia Masoud. "Enhancing DNN models for EEG/ECoG BCI with a Novel Data-Driven Offline Optimization Method," in *IEEE Access, vol. 11, pp. 35888-35900, 2023*, doi: 10.1109/ACCESS.2023.3265040

[2] **Antonios Tragoudaras**, Charalampos Antoniadis, Yehia Masoud. "TinyML for EEG Decoding on Microcontrollers," in *2023 IEEE 56th International Symposium on Circuits and Systems (ISCAS)]*

[3] **Antonios Tragoudaras**, Pavlos Stoikos, Konstantinos Fanaras, Athanasios Tziouvaras, George Floros, Georgios Dimitriou, Kostas Kolomvatsos, Georgios Stamoulis. "Design Space Exploration of a Sparse MobileNetV2 Using High-Level Synthesis and Sparse Matrix Techniques on FPGAs," in *MDPI Sensors 22, no. 12: 4318]*, doi:10.3390/s22124318

[4] Konstantinos Fanaras, **Antonios Tragoudaras**, Charalampos Antoniadis, Yehia Masoud. "Audio-visual Speaker Diarization: Improved Voice Activity Detection with CNN based Feature Extraction," in *2022 IEEE 65th International Midwest Symposium on Circuits and Systems (MWSCAS), Fukuoka, Japan, 2022, pp. 1-4*, doi: 10.1109/MWSCAS54063.2022.9859533

Awards and Honors

Aug. 2022- Aug. 2023 **KAUST Graduate Fellowship**: Full tuition support, living allowance, housing, and medical coverage. *KAUST*

Teaching Experrience

Graduate Teaching Assistant at UvA's MSc AI Program *UvA, Amsterdam, Netherlands*

Assisted in teaching graduate-level (first-year) courses by making sure students understood the material, answering their questions, creating assignments, giving feedback, and grading exams.

Aug. 2024 - Present

Courses:

- Computer Vision 1 (MSc AI)
- Deep Learning 1 (MSc AI)
- Fairness, Accountability, Confidentiality & Transparency in AI (MSc AI)