Aristotelis Styanidis

Machine Learning Engineer @ CardioID Technologies
Lisbon, Portugal
Email: aristianos@hotmail.com
Website: aristyan.github.io

Experience

Machine Learning Engineer - Doctoral Researcher Oct 2024 - Present
CardioID Technologies *Lisbon, Portugal*

- Create machine learning models that relate individual physiological dynamics with road safety indicators, with the ultimate objective of accurately and reliably detecting and warning, in real-time, when the driver is unfit for the driving task, regardless of automation level.
- Conduct road safety research by compiling a taxonomy of driver monitoring technologies.
- Create innovative algorithms for physiological-based, real-time prediction of driver capability and its impact on safety, in several real-world scenarios.
- Explore and create frameworks to assess the ethical and privacy dimensions of the use of driver monitoring technologies.

Machine Learning Engineer - Software Developer May 2024 - Sep 2024
Pragma-IoT *Thessaloniki, Greece*

- Conducted research on diffusion models for subject-driven text-to-image generation.
- Implemented state-of-the-art methods for personalized image enhancement.
- Collaborated with researchers from Samsung R&D Institute UK (SRUK) on personalized foundation models.

Machine Learning Engineer - Research Assistant Apr 2023 - Sep 2024
Information Technologies Institute, Centre for Research & Technology Hellas *Thessaloniki, Greece*

- 3D model reconstruction from video input using Structure from Motion
- Underwater image enhancement using generative AI models
- Vibration and acoustic anomaly detection using autoencoders
- Q&A information extraction and trending topic detection using LLMs

Machine Learning Engineer - Research Assistant Jan 2023 - Apr 2023
iSense Group, ICCS, National Technical University of Athens *Athens, Greece*

- Explored the capabilities and limitations of high-dimensional hyperspectral images, in conjunction with a Cyber-Physical Sorting System, for effectively categorizing urban waste.
- Built and trained object detection models, such as YOLO, to achieve intelligent urban waste classification.
- Integrated solutions to more complex products in collaboration with Robotic Engineers, Material Scientists, and Product/Business constraints.

Education

National Technical University of Athens Oct 2024 - Present
Doctor of Philosophy - PhD *Athens, Greece*

- Research Areas: Physiological Computing, Signal Processing, Transport Engineering, Deep Learning
- Dissertation: "Road safety prediction on the basis of ethically sound physiological measurements", Advisors: Prof. George Yannis, Dr. André Lourenço

KU Leuven Oct 2021 - Feb 2023
Advanced MSc in Artificial Intelligence *Leuven, Belgium*

- Grade: 70.45 %, Cum Laude - Distinction
- Track: Engineering and Computer Science
- Dissertation: "Automatic Segmentation of Glomerular Substructures in Kidney Biopsy Electron Microscopy Images using Deep Learning Techniques", Advisors: Prof. Maarten De Vos, Prof. dr. Amélie Dendooven

Aristotle University of Thessaloniki Sep 2013 - Apr 2020
Diploma in Electrical and Computer Engineering *Thessaloniki, Greece*

- Grade: 78.50 %, Very Good
- Track: Electronics and Computers
- Dissertation: "Transportation Mode Recognition and Daily Timeline Creation Using Deep Learning", Advisor: Prof. Anastasios Delopoulos

Publications & Poster Presentations

Aristotelis Styanidis, Michail Loufakis, Panagiotis Symeonidis, Dimosthenis Ioannidis, Dimitrios Tzovaras and Ioannis Kourmpetis (2024). **Vibration-based Anomaly Detection on Weather Radar Rotating Machinery using One Dimensional Convolutional Autoencoder**. In Proceedings of Second International Conference on Intelligent Perception and Computer Vision. CIPCV 2024. (published)

Michail Loufakis, **Aristotelis Styanidis**, Panagiotis Symeonidis, Dimosthenis Ioannidis, Dimitrios Tzovaras, George Oikonomou, Ioannis Kourmpetis, Panagiota Papagianni and Ilias Agoudimos (2024). **Acoustic Anomaly Detection on Weather Radar Machine Sounds Using Augmented Spectrograms**. In Proceedings of Ninth International Congress on Information and Communication Technology. ICICT 2024. (published)

Amélie Dendooven, **Aristotelis Styanidis**, Louis Raes, Amaryllis Van Craenenbroeck, Matthias Maeyens, Konstantinos Kontras, Maarten De Vos. #4694 **Automatic Segmentation Of Glomerular Substructures By Deep Learning**, Nephrology Dialysis Transplantation, Volume 38, Issue Supplement_1, June 2023. (published)

Selected Projects

Vibration Anomaly Detection

- Processed raw vibration signals, including data cleaning, resampling, and scaling.
- Implemented an overlapping sliding window approach to capture temporal dependencies in data segments.
- Applied data augmentation techniques, including noise addition, rotation, magnitude warping, and time warping.
- Developed a robust deep learning framework using a 1D convolutional autoencoder for detecting anomalies in radar vibration data provided by the Hellenic Air Force.

Acoustic Anomaly Detection

- Derived mel spectrograms for individual audio signals and implemented a 50% overlap sliding window approach for creating mel spectrogram frames. Utilized a window size of 1024 samples tailored for Fast Fourier Transform (FFT).
- Developed a deep learning framework for acoustic anomaly detection using a 2D convolutional autoencoder for detecting anomalies in radar acoustic data provided by the Hellenic Air Force.

Semantic Segmentation in Electron Microscopy

- Annotated two glomerular substructures in kidney biopsy electron microscopy images.
- Developed a deep learning framework for semantic segmentation using the U-Net architecture, achieving state-of-the-art performance.
- Leveraged unlabelled data using contrastive learning to construct meaningful representations, ultimately improving model performance.

Transportation Mode Recognition

- Designed an Android app.
- Collected acceleration and location data from a diverse user group for five different transportation modes.
- Conducted data preprocessing and manually extracted relevant features.
- Experimented with three different architectures, with the best performance achieved through combining acceleration and location data.

Honors and Awards

PhD Scholarship, Marie Skłodowska - Curie Action (MSCA)
National Technical University of Athens Oct 2024

Skills

- **Programming:** Python (PyTorch, Tensorflow, Numpy, Pandas, Scikit-learn, Librosa, TorchAudio, OpenCV), C++
- **Experienced with:** Unix/Linux, SQL, Android Studio, MATLAB, Git
- **Soft Skills:** Teamwork, Adaptability, Fast Learner, Time Management, Communication Skills
- **Languages:** Greek (native), English (proficient), French (intermediate), German (intermediate), Portuguese (elementary)