Ioannis **Demetriades**

Data Scientist · Computer Vision

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Summary

Current Data Scientist at a consulting firm, assisting clients in developing solutions that enhance efficiency and aid decision-making. Motivated by tackling complex tasks, I am always seeking the next big challenge. I aim to leverage my existing "toolkit" while experimenting and adopting new technologies. I thrive in collaborative and dynamic environments that value creativity and strategic thinking, enabling me to make a meaningful impact.

Education

Cambridge University, Christ College, United Kingdom

Oct. 2019 - Jun. 2023

BA & MEng Computer and Information Engineering

Results: 2.1 & Merit

- **Relevant Modules:** Computational statistics and Machine Learning, Probabilistic Machine Learning, Deep Learning and Structured Data, Computer Vision, Mathematical Methods (Optimization) and Statistical Signal Analysis.
- **Fourth year project:** Use Artificial Intelligence to develop ECG analysis algorithms to assess the likelihood of an ECG containing Atrial Fibrillation (AF). The techniques developed could be used to prioritise ECGs for manual reviews in AF screening, reducing the manual workload associated, whilst maintaining the accuracy of the AF diagnosis.

Pascal Greek School, Cyprus

Sept. 2013 - Jun. 2018

Secondary Education

- **Secondary School Leaving Certificate (Apolytirion):** 19.56/20 (equivalent to 144 UCAS tariff points).
- **Awards:** Top student within the cohort, Full Scholarship throughout studies.

Institute of Mathematics and Science (IMS), Cyprus

Sep. 2014 - Jun. 2018

Secondary Education

- **A Levels:** Mathematics (A*), Further Mathematics (A*), Physics (A*) and Statistics (A) (total 216 UCAS tariff points).
- **Awards:** Highest Mark in Europe for Physics A Level.

Technical Skills

- **Languages & Libraries/Frameworks:** Python, PyTorch, TensorFlow, OpenCV, NumPy, Matplotlib, Seaborn, PIL, Pandas, Scikit-learn
- **Tools & Platforms:** AWS, Git, VS code
- **Computer Vision applications:** Object recognition and detection, Face recognition and detection, OCR, Object segmentation, Image generation, Medical Image Analysis
- **Machine Learning application:** Classification, Regression, Clustering, Dimensionality Reduction, Optimization
- **Models & Deep Learning Architectures:** CNN, RNN, LSTM, ResNet, Unet, GAN, VAE, R-CNN, YOLO, Vision Transformer, BLIP, CLIP, Random Forest, XGBoost, SVM, KNN, K-Means, PCA.

Certificates

2023 **AWS,** Certified Cloud Practitioner

2024 **OpenCV,** Mastering OpenCV with Python

Work Experience

Data Reply

Aug. 2023 - Current

Data scientist/Consultant

London, UK

- Co-led the development and implementation of a Multimodal model-based POC, enabling content captioning and topic analysis, which identified key patterns and insights in product content, enhancing data-driven decision making.
- Successfully increased the data quality of a critical production-level project, through rigorous evaluation and analysis enabling the improvement of the Machine learning models in place.
- Increased process efficiency and reduced manual input by streamlining entity detection and content re-arrangement within images.
- Accelerated product variation development by deploying a Streamlit web-app on AWS EC2 for prompt-based in-painting using models like CLIP and Stable Diffusion, significantly reducing experimentation time.
- Produced high-quality synthetic datasets for defect detection, semantic segmentation, and depth estimation using NERF-based models and NVIDIA Omniverse as part of an R&D team.

Human Action Recognition, Royal Holloway University of London

June. 2022 - Sept. 2022

Deep Learning Researcher (Internship) *London, UK*

- Built and trained a hybrid CNN-LSTM model on Pytorch using pre-trained CNN (GoogleNet), LSTM and Attention layer to perform human action recognition on short videos.
- Created a custom dataset using the UCF-101 dataset to feed in the model by sub-sampling frames from short videos.
- Achieved an accuracy of 68% on the HAR classifier.

Focused Ultrasound foundation (FUS), Technological University of Cyprus

Jul. 2021 - Augh. 2021

Researcher (Internship) *Limassol, Cyprus*

- Investigated image processing techniques to identify heat concentration from Ultrasound on MRI images.
- Practiced C# by assisting in replicating an image processing technique from MATLAB to C#.
- Developed a software to control a robotic system of two EM1 Transmissive Optical Encoders as part of a prototype device that as used to accurately position the transducers.

National Guard

Jul. 2018 - Sep. 2019

Soldier *Cyprus*

- Gained strong teamwork, discipline, and leadership skills through leading a small team.

Projects

Computer Vision, FaceNet Distillation

June 2024

- Conducted knowledge distillation from a pre-trained ResNet model to a MobileNetV3 model, successfully reducing the number of parameters by 93%.
- Trained and evaluated the distilled model on the CASIA-WebFace dataset, achieving a mean cosine similarity of 0.998 and a mean MSE of 6.63e-6 between the embeddings of the teacher and student models.
- Successfully reduced latency by 39% on GPU and by 84% on CPU on live video footage.

Generative AI, Multimodal Retrieval Augmented Generation (RAG)

April 2024

- Orchestrated diverse AWS services to execute Multimodal Retrieval Augmented Generation (RAG) based on deck content.
- Designed and implemented AWS Lambda functions with triggers, automating the conversion of uploaded data on a S3 Bucket into images, streamlining the preprocessing phase.
- Leveraged the Titan Multimodal model from Amazon Bedrock to generate embeddings for images and integrated Amazon OpenSearch for efficient storage and retrieval through k-NN search.
- Implemented Llava as the multimodal model to retrieve relevant information.

Statistical Machine Learning, High Dimensional MCMC

Jan. 2023

- Tested the Gaussian Random Walk Metropolis Hastings (GRW) and preconditioned Crank-Nicolson (pCN) algorithms to infer the latent space, compare their performance, computational costs as well as the effect of dimensionality and step-size on the robustness of the algorithms using Python.
- Implemented both MCMC algorithms using bike theft data from Lewisham Borough in 2015 to compute the mean absolute error between true and inferred number of bike thefts in the area.
- Concluded that the pCN algorithm performs better than GRW, is unaffected by dimensionality and is less computational expensive.

Machine Learning, Kaggle House Price Prediction Competition

Jul. 2022

- Forecasted house prices in Ames, Iowa through the utilization and comparison of numerous advance regression models and pre-processing data techniques, achieving a low MSE and ranking within the top 20%.
- Evaluated the different regression methods using the PyCaret library through 10-fold cross validation, with the CatBoost regression performing the best among alternative regression models such as XGBoost.
- Applied different data cleaning, feature engineering and feature transformation techniques using libraries such as Numpy, Pandas, Scikit-learn, Seaborn and Matplotlib to develop further my pre-processing skills.