Benjamin Sanati

Machine Learning Engineer

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I am an Electronic Engineering with AI Masters graduate from the University of Southampton. My experience includes a multitude of projects in machine learning, deep learning, and data science. I have applied my skills and knowledge to solve complex problems and drive innovation, and am eager to apply my skills in a challenging role that will allow me to grow both personally and professionally.

WORK EXPERIENCE

Data Science Intern — July 2023 – Present

Cirium, London

- Awarded a Data Science internship due to my team's performance in an AI hackathon
- Executed time-series forecasting and geospatial analysis using temporal and spatiotemporal machine/deep learning techniques within an agile management framework to steer project success
- Acquired industry experience using AWS Athena, S3, Databricks, Spark, SQL, PyTorch, TensorFlow, Pandas and NumPy on large, real-world data

Undergraduate Research Scholar — June 2022 – September 2022

University of Southampton - https://github.com/ben-sanati/ViT-MOT

- Conducted research and trained efficient computer vision architectures, specializing in object detection and vision transformers, allowing me to develop proficiency in transfer learning
- Investigated novel sparse temporal sampling modules, reducing compute demands during inference
- Presented project insights to students & academics, showcasing strong presentation capabilities

EDUCATION

University of Southampton, Southampton — September 2019 – June 2023

MEng (Hons) — Electronic Engineering with Artificial Intelligence (1st: 79%)

Hills Road Sixth Form College, Cambridge — September 2017 – June 2019

A Levels – Physics, Chemistry, Mathematics

PROJECT EXPERIENCE

Masters Group Design Project — October 2022 – January 2023

University Project - https://github.com/TrainOrg52/AutoSign

- Utilized state-of-the-art object detection and image classification models to develop a proof-of-concept mobile application, automating the labour-intensive train sign inspection process for an industrial partner
- The project garnered a final report score of 90%. Additionally, I achieved an overall module grade of 87%, reflecting my substantial contribution and expertise
- Fine-tuned pre-trained object detection (YOLOv7) and image classification (BEiT) models using a curated custom dataset, achieving more than 0.92map@0.5 and 97% classification accuracy respectively
- Orchestrated the integration of the machine learning workflow with Firestore and the mobile application, ensuring a robust and efficient final system poised for rigorous testing
- Effectively presented the project's scope, methodologies, and findings to academic mentors and fellow cohort members

Year 3 Dissertation – Dynamic DNNs

September 2021 – May 2022

University Project - https://github.com/ben-sanati/P3-IP-Class-Granular-Classifications

- Undertook a comprehensive investigation, delving into the nuanced balance between accuracy and specificity of classifications in early-exiting dynamic Deep Neural Networks (DNNs)
- Crafted a novel Convolutional Neural Network (CNN) architecture, Super-HBN, distinguished by its ability to confer adaptable classifications with varying levels of granularity during inference
- Conducted an exhaustive comparative analysis of the devised model against analogous architectures, thereby furnishing a comprehensive evaluation of its efficacy and performance characteristics
- Effectively conveyed research findings and their implications to esteemed academics during the project viva, achieving an overall mark of 83%

SMALLER NOTABLE PROJECTS

Deep Learning Reproducibility Challenge

Verified assertions by Chandra et al. (2022) through experiment replication, result visualization, and offering insights along with recommendations for future research paths concerning hyperoptimizers in deep learning.

Data Mining: Forecasting the Performance of the Fashion Industry

Curated a bespoke dataset for performance forecasting of the luxury fashion industry. Thorough preprocessing and a variety of time-series models were implemented, achieving a final MAPE of 11.36%.

AI Hackathon

Developed an LSTM solution to tackle a flight load factor forecasting challenge, outperforming competitors by 3% and resulting in a summer internship at Cirium.

AWARDS AND CERTIFICATIONS

Undergraduate Research Scholarship

University of Southampton

Coursera Certifications

- Neural Networks and Deep Learning
- Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization
- Structuring Machine Learning Projects
- Convolutional Neural Networks

SKILLS & OTHER

Machine/Deep Learning Technologies: PyTorch, PyTorch Lightning, Optuna, PySpark, Pandas, NumPy, SciKit-Learn
Impactful University Modules: Foundations of ML, Advanced ML, Computational Finance, Differentiable Programming and Deep Learning, Data Mining, Advanced Computer Architecture
Tools: Python, SQL, Databricks, Git, Linux, C++, AWS (S3 and Athena), Databricks, Slurm, LaTeX