Henrique Sousa
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Skills

- **Technical Skills**: Deep Learning, Machine Learning, Data Science
- **Programming Languages**: Python, SQL, Java, C++
- **Programming Frameworks**: Pytorch, Tensorflow, Keras, HuggingFace, Pandas, OpenCV, Matplotlib
- **Technologies**: Git, Docker, GCP/Azure/AWS with Docker App Deployment

Experience/Projects

- **Master Thesis** — Instituto Superior Técnico, Lisboa
  Deep Learning Research — *September 2020 - October 2022*
  - **Problem description**: Thesis problem and motivation available at Master Thesis.
  - **Deep Learning knowledge**: The preparation and background review gave me a deep and intuitive understanding behind the different state of the art deep learning architectures (Transformers, MLPs, CNNs and RNNs) and their advantages and disadvantages based on the type of data.
  - **Model building and state of the art techniques**: Experience in creating and combinining customized model layers. Review, application and testing of all state of the art techniques for increased model performance such as batch norm, dropout, early stopping, etc ...
  - **Model Inference and Results**: Development of a deep learning classification model and strategy to leverage trained model weights to identify genetic features (SNPs) with zero individual correlation to a disease, but which contribute through nonlinear interactions with other features. In datasets where the impact of SNPs contributed merely 1% to the variation in the probability of disease for the samples, the model exhibited its capability to accurately identify the pertinent combination of significant SNPs despite the subtle nature of the correlation. The model was able to outperform the state of the art non exhaustive solutions/models.
- **Quantitative Research and Algorithmic Trading** — Lisbon
  Software Engineering, Data Science, Deep Learning — *Nov 2022 - Present*
  - **Strategy Backtester**: Designed and coded an algorithmic trading strategy alongside a comprehensive Python backtesting system with several years of price action data. The implementation incorporates intricate information interaction across multiple timeframes, with special attention to ensuring a rigorous execution of trades within minutes.
  - **Optimization**: Developed strategy optimizations evaluated using statistical testing. Also integrated deep learning optimization projects to extract potential information regarding selection of signals using CNNs, Vision and Regular Transformers based on their prediction confidence.
  - **Live execution and APIs**: Implemented an automated execution system for the strategy in live markets in combination with the APIs of multiple exchanges. Incorporated continuous data feeds and error handling mechanisms to ensure uninterrupted and robust trading operations. The execution was further optimized to run with low latency.
  - **Visualization Tools**: Developed and integrated visualization tools for both continuous live data and historical results, facilitating ongoing strategy evaluation and adjustment using Finplot and PyQt libraries which proved itself essential to strategy execution debugging.
- **Deep Learning Projects** — Lisbon
  Deep Learning, Software Engineering
  - **Deep Learning end to end projects**: I have implemented multiple deep learning models to different projects of which some selected ones are showcased at Portfolio. I have also experimented with deploying these models with Docker to different cloud providers such as GCP, AWS, Azure and HuggingFace.

Education

- **Instituto Superior Técnico** — Lisboa, Portugal
  Master of Science in Computer Science and Engineering — *2018 – 2022*
  - **Relevant Courses**: Data Science, Machine Learning, PLIDM(Planning, Learning and Intelligent Decision Making), Artificial Intelligence in Games, Autonomous Agents and Multi-Agent Systems, Natural Language
- **ISCTE-IUL** — Lisboa, Portugal
  Bachelor of Engineering in Computer Science and Engineering — *2015 – 2018*