André Carvalho

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Nationality	Portuguese

Currently

2019 **Data Scientist and Researcher - Instituto Soldadura e Qualidade**

- Application and research of deep neural networks solutions, to identify olive tree plagues using European Space Agency (ESA) hyperspectral satellite imagery;

Responsible for Planing and dev. of the System architecture (front-end and backend);
Development of deep learning models;
Front-end development.

Technologies and frameworks: TensorFlow, keras, keras-tuner, OpenCV, rasterio, Matplotlib, Multiprocessing, Flask, Angular, TypeScript, HTML, CSS, Git.

***- Application and research of deep neural networks solutions, to improve Deep Sea Mining* of mineral resources, using European Space Agency (ESA) hyperspectral satellite imagery;**

Responsible for System Architecture (front-end and back-end) planing and development;
Research and application of deep learning models;
Design and Dev. of RESTful front-end and back-end communication API;
Communication with clients, to share progresses ideas and deciding the following steps.

Technologies and frameworks: TensorFlow, keras, keras-tuner, OpenCV, rasterio, Matplotlib, Multiprocessing, Flask, Angular, TypeScript, HTML, CSS, Git;

- Predictive maintenance to identify machinery malfunctions at an industrial scale.

Dev. of database architecture i.e. relational model;
Dev. of web-based management platform (deploy by me via EC2 - AWS);
Dev. of automatic report system;
Dev. of machine learning models to predict possible malfunctions.
Communication with clients in order to decided the following development stages;

Technologies and frameworks: Scikit-learn, Matplotlib, Flask, created REST-API, PostgreSQL, Angular, TypeScript, OpenMaint, HTML, CSS, Latex, Git;

- Optimization of water supply systems distribution network using machine-learning models.

Software engineer role:
- Restructure and refactor existing code to a OOP approach to support future developments;
- Prepare and implement code to be used in high-performance computing infrastructures;
- Use AWS cloud computing services to speedup a custom optimization algorithm intended to improve pump scheduling.

Technologies and frameworks: keras, numpy, sklearn, multiprocessing, Matplotlib, AWS, Flask, created REST-API, PostgreSQL, Angular, TypeScript, OpenMaint, HTML, CSS, Latex, Git;

Past Experience

2017-2018 Lab Professor - Foundations of Programming
1 Semester *Instituto Superior Técnico, Lisbon, Portugal*

Lectures on topics such as Python3, Object-oriented programming, Lists, HashTables, Map-Reduce

2016-2017 Lab Professor - Introduction to Algorithms and Data Structures
2 Semester *Instituto Superior Técnico, Lisbon, Portugal*

Lectures on topics: C language, iterative and recursive algorithms, Sorting algorithms: direct sort, selection sort, bubble sort, quick sort, merge sort. Data types: stacks, queues, priority queues and heaps. Searching in trees. Dynamic data structures. Binary trees. Balanced binary trees. Hash tables. Collision resolution by chaining and open addressing. Double hashing.

Skills e Experience

- **Machine-learning, Computer Vision, Deep Learning**
- **Python, C, Typescript, Java, Matlab, Bash (among others)**
- **Angular, Flask(+waitress), Node.JS, JS, HTML, CSS**
- **ElasticSearch, MongoDB, SQL, S3**
- **Docker, Kubernetes, AWS, HPC, Hadoop, Spark**
- **Git, Unit Testing, Jira, Teams, Slack, Discord, Agile**

Education

2015-2019 PhD Information Systems and Computer Engineering - Instituto Superior Técnico

Passed with distinction
Focused on improving recommendation systems computational efficiency by leveraging Fuzzy Fingerprints.

2012-2014 MSc Telecommunications and Informatics Engineering - Instituto Superior Técnico

Thesis grade 17
Final grade 16
Development of a recommendation system that identifies relevant keywords and maps them for each user.

2009-2012 BSc Computer Networks and Multimedia Engineering - Inst. Superior de Engenharia de Lisboa

Third Year Project grade 18
Final grade 15
Car track stopwatch using computer vision and machine learning models to identify different cars that pass by.

Publications

- **Tag-Based User Fuzzy Fingerprints for Recommender Systems** ***[url]***
  May, 2018
- **Fuzzy fingerprints for item-based collaborative filtering** ***[url]***
  Nominated for Best Student Paper Award
  September, 2017
- **Combining ratings and item descriptions in recommendation systems using fuzzy fingerprints** ***[url]***
  July, 2017

Personal interests

- **Tennis**
- **Financial markets**
- **Travelling**
- **Photography**