Dr Germán Martínez-Ayuso

PhD, Software Engineer

germanmartinezayuso@gmail.com

germa89

germa89.github.io

gmartinezayuso

germa89

Resume PDF

LANGUAGES

English (Bilingual)

Spanish (Native)

French (Beginner)

INTERESTS

Running

Playing football

Gym

Reading novels

CAREER PROFILE

I'm a software enginner with extensive experience in python programming, software development, and continous integrations-continous deployment. Experienced with AI and machine learning, I have applied different machine learning algorithms such as KNN neighbours I also posses a PhD in Civil Engineering from Swansea University in materials modelling using finite elements method.

SKILLS & PROFICIENCY

Programming
Python, C++, Matlab, ...

Software development
CI/CD, docker, Github Actions, ...

Data science
Numpy, Pandas, ...

Machine learning algorithms
Decision trees, KNN, ...

EXPERIENCES

Senior Research and Development Engineer
2023 - Present

Ansys Inc

- Main maintainer of PyMAPDL library, an open source Python interface to Ansys MAPDL structural solvers.
- Co-owner of Ansys github enterprise organization
- Co-maintainer of MAPDL solver ubuntu docker image
- Contributor to MAPDL solver and gRPC interface
- Mentoring new employees
- Supporting customer engagements.

Research and Development Engineer II
2021 - 2022

Ansys Inc

- Contributor to PyMAPDL library.
- Supporting other Ansys libraries ansys/actions, ansys-tools-path, ansys-sphinx-theme, etc
- Supporting the technological transformation of business units. Implementing code best-practices.

Research Officer in Data Science
2020 - 2021

Medical School, Swansea University, Swansea, UK

- Application of machine learning algorithms (clustering and deep learning techniques) to detect abnormal behaviour in real cardiac cells optical data and fluorescent calcium measurements. Application to commercial business case.
- Image processing for data extraction. Application of machine learning techniques to extract data features.
- Design and development of an application with graphic user interface for data analysis of microscope images.
- Processing health image big data using own algorithms. Development of our database.

Research Fellow
2019 - 2020

Institute of Material Discovery, University College of London, London, UK

- Collaborated with industrial and academic partners to develop a web platform for industry access to materials modelling expertise. This project was funded by the European Union and companies such as Fraunhofer, Enthought, Bosch, etc.
- Collaborated with colleagues using Machine Learning to predict materials properties and accelerate materials discovery. Text mining on research databases.
- Using numerical techniques based on finite element methods (FEM) to optimise industrial composites such as honeycomb or recycled aggregates.

Project officer
2018 - 2019

Swansea University, Swansea, UK

- Application of techniques from the domain of data science such as data pre-processing, neural networks and multi constraint optimisation to reduce costs in steel manufacturing industry.
- Developed an addon in Python and JavaScript for a commercial finite element software ANSYS. This addon integrates in the interface of ANSYS application and perform operations to simplify continuum mechanics calculations.
- Developed Python scripts to collect and analyse large data sets from files, websites, etc.
- Developed numerical models to improve manufacturing processes in the industry. The processes range from material behaviour prediction to optimisation of properties such as geometry, elastic properties, viscosity, etc.

Research Assistant
2017

Swansea University, Swansea, UK

Developed numerical models of a wing energy harvester using Matlab to couple different commercial software. Used Matlab to analyse and study large data sets from experiments.

EDUCATION

PhD in Civil Engineering
2015 - 2019

Swansea University

Micro to macro-scale material modelling using numerical techniques for energy harvesting applications. Fully-funded scholarship

M.Sc. in Structures
2013 - 2014

University of Granada, Spain

Strong background in numerical methods and programming.

M.Eng. in Civil Engineering
2010 - 2013

University of Alicante, Spain

Strong background in numerical methods.

B.Eng. in Civil Engineering
2007 - 2010

University of Cordoba, Spain

Special award, Graduated with honours. Best student record award.

DATA SCIENCE PROJECTS

A (small) list of projects, repositories and/or ideas I am involved in.

Machine learning for damage detection - Machine learning algorithms such as Principal Component Analysis (PCA) and Gaussian Mixture Models (GMM) for damage detection in rolling bearings.

Financial fraud detection using machine learning - Using machine learning algorithms (boosted decision trees) to detect fraud in credit cards records.

Marketig campaing prediction - Predict the success rate of a marketing campaing given previous records.