Pedro Gabriel Amorim Soares

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Computer Science BSc

Pontifícia Universidade Católica de Minas Gerais, PUC MG

(Pontifical Catholic University of Minas Gerais)

Previous positions

2019-2022: Computational Mathematics undergrad, UFMG

Software engineering intern - VulcaNet, Campinas, SP - Remote (2022)

- Worked on improving scalability and perfomance of a distributed VoIP and messaging (integrating mail, sms, whatsapp, etc) product.
- Designed, refactored and implemented solutions and features in microservices written mainly in Python and Typescript.
 - Implementation of DDD (Domain Driven Design) and CQRS (Command Query Responsability Segregation) patterns for better scalability and database access perfomance.
 - Refactoring of ORM (SQLAlchemy) usage throughout the solution for better integration with GraphQL and database access decoupling.
- Applied and maintained standard software engineering practices within an Agile development workflow, with consistent use of version control tools.
- Development, configuration and refactoring of CI/CD tooling and monitoring solutions.

Research Assistant- DCC / MPMG Analytical Capabilities Program (2021)

- Development and implementation of algorithms in Python / Spark for pattern mining in graphs generated from data provided by the Public Ministry of Minas Gerais.
- Worked with technologies for storage and processing of massive data from the state of Minas Gerais (Docker, MySQL, PySpark, NoSQL databases for graph modeling such as ArangoDB, JanusGraph).

Volunteer Scientific Initiation Student, DCC (2021)

Development of evolutionary heuristics for mining exceptional survival models.

- Worked in Google's Latin America Research Awards winning project "Use of data mining to analyze clinical and demographic risk factors of severe cases of Covid-19 in Brazil".
- The project was presented at the largest artificial intelligence congress in Latin America, BRACIS (Brazilian Conference on Intelligent Systems) and published as a chapter in the book "Intelligent Systems" by Springer International - "Mining of exceptional survival models".
- Development, optimization, and application of bio-inspired artificial intelligence models for discovering rules and attributes in large medical databases that characterize groups of patients with exceptional survival.
- Performance analysis and code refactoring in Python of the algorithm used, redesign and optimization of data structures, and implementation of new functionalities considering high-dimensional data.

Advisor - Prof. Dr. Renato Vimieiro Co-advisor - Juliana Barcellos Mattos

Volunteer Scientific Initiation Student, FACE (2019 - 2020)

Usage of artificial intelligence for predicting insolvency of Brazilian medical-hospital health insurance providers.

- Development and application of artificial intelligence models for predicting, preventing, and understanding key factors in the phenomenon of bankruptcy of Brazilian health insurance companies.
- Exploration, visualization, and preprocessing of public data from the sector using Python libraries (pandas, numpy, matplotlib, seaborn, plotly).
- Study and application of classification and model validation methods (scikit-learn, Keras, and TensorFlow) and selection of key variables using genetic algorithms (Distributed Evolutionary Algorithms in Python, DEAP) based on economic-financial and operational variables related to the characteristics of health insurance companies.

Advisor - Prof. Dra. Ana Carolina Costa Corrêa

Research Intern at ENACOM (2020)

- Implementation of classification and regression models in Python to predict and understand failures in industrial processes.
- Development, extraction, and selection of features used in the models from databases provided by the client.
- Research and development of an integrated system for application in the production process, enabling real-time preventive adaptability.
- Understanding and gathering specifications of the phenomenon with experts and workers for the application of explanatory methods in the models used.

Research Intern in Prague (January and February 2020)

UNIGOU Scientific Exchange Program, Czech Technical University

Institute of Czech-Brazilian Academic Cooperation (INCBAC)

- Research and development of experimental conditions for measuring human perception of video transmission quality.
- Planning and conducting of experiments with volunteers to analyze the impact of visual distraction on critical tasks, such as driving automobiles.
- Study and application of statistical methods for analyzing experimental results.
- Presentation of obtained results at an academic event.

Advisor – Prof. Ing. Jan Holub, Ph.D.

Exchanges

Université Gustave Eiffel - ESIEE Paris (2024 - 2025)

Completed coursework in the following areas:

- **Cybersecurity & Cryptography** (Introduction to Cybersecurity, Cryptography & Communication Security)
- Algorithms & High-Performance Computing (Algorithm Design, Applied Algorithms, HPC)
- Computer Vision & Image Processing (Introduction to Image Analysis)
- Mathematical Foundations & Optimization (Graphs & Algorithms)
- French Language & Culture

Extracurricular Activities

- **Club Musique**: Honorary member, participated in musical performances and gave piano lessons to other students.
- **Club Photo**: Engaged in creative photography projects.

• **Club*Nix**: Explored, discussed and promoted open-source technologies, participated in Linux Installfests.

Main Extracurricular Courses

C++ Nanodegree Program, Udacity (December 2022)

- Developed a <u>route planner</u> using OpenStreetMap data and A* search.
- Built a system monitor using Neurses and basic linux knowledge.
- Implemented a <u>traffic</u> (intersection management) control simulation, practicing with smart points and related memory allocation concepts.

Neural Networks and Deep Learning, 4 weeks, Coursera. (June 2020)

- Construction and training of artificial intelligence models applied to deep learning through Neural Networks.
- Identification and understanding of the main components of the network architecture used.
- Computational and mathematical optimization of the developed models.

Instructor: Andrew Ng, adjunct professor at Stanford University and co-founder of Google Brain.

Python courses with applications in Machine Learning and data exploration. (2019, 2020, 2021)

Languages

- English Advanced. TOEFL iBT score: 107/120 (2023).
- French Intermediate. 6-month academic exchange in France.
- German Basic. Cultural and language exchange in Berlin (Jan 2018).

Recommendation Letter

HEAD OF THE DEPARTMENT OF MEASUREMENT FACULTY OF ELECTRICAL ENGINEERING



Prague, February 27, 2020 ref.no. 27/01/20 Page 1

To whom it may concern

This letter confirms that Pedro Gabriel Amorim Soares, student of the Federal University of Minas Gerais, has successfully completed assignments during his internship at the Department of Measurement of the Faculty of Electrical Engineering at the Czech Technical University in Prague, where he stayed from January 14th 2020 to March 6th 2020. During his stay, he demonstrated great knowledge and was enthusiastic and interested in his studies. The tasks he performed here covered the study of subjective and objective speech quality measurement methods, design and execution of subjective test including parallel task and statistical analysis of the results. Pedro had an outstanding performance while working on his research. I am very pleased with the work he has accomplished here, and it was a pleasure for me to work with him. I would certainly recommend him for any engineering task. I can certainly provide any additional information if there are any questions regarding Pedro's work in our department. Please do not hesitate to get back to me.

Sincerely,

Prof. Ing. Jan Holub,Ph.D. Supervisor Head of Department of Measurement Czech Technical University Faculty of Electrical Engineering Technicka 2, 166 27 PRAGUE 6 Czech Republic

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