

JOÃO PEDRO DA SILVA

Software Engineer — Remote Sensing and Machine Learning Researcher

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RESEARCH PROJECTS

Satellite Imagery and Machine Learning for Predicting Socioeconomic Indicators in Brazil

University of São Paulo

Jul. 2022 – Present São Carlos, Brazil

- Abstract:** Brazil has a considerable portion of its population living in vulnerable conditions, with about 30% of Brazilians living in poverty and approximately 8% in extreme poverty. To understand and face this problem, it is essential to have access to updated data on poverty and trace the socioeconomic profile of the population. In this context, Censuses and demographic surveys play a crucial role. However, conducting a Census in Brazil faces significant challenges, both in terms of cost and logistical difficulties. Given the difficulties of collecting data in the traditional way, passively collected data sources, such as satellite imagery, may be an alternative way to measure these results. Therefore, the objective of this project is to use Deep Learning models combining nighttime and daytime satellite imagery to predict socioeconomic indicators. This technique holds the potential to enhance our comprehension of the socioeconomic landscape in Brazil and provide technical means for the analysis of countries that face difficulties in conducting Censuses.
- Tools:** Python, rioxarray, pandas, geopandas, scikit-learn, Sentinel Hub, Google Maps Static API, tensorflow, keras, CNN models (VGG16 and ResNet50).

PROFESSIONAL EXPERIENCE

Backend Engineer — Senior

impactMarket

Jul. 2021 – Present Braga, Portugal

- Working on the impactMarket backend. A platform that provides accessible financial services such as Unconditional Basic Income for poverty alleviation.
- Using **Node**, **AWS** (Lambda, S3, EC2, API Gateway), **Unit tests** (Mocha and Chai), **Postgres**, **Redis**, **Heroku**.
- In addition, in a complementary way, I work with blockchain tools, such as Smart Contracts, listening network events, and so on.

Backend Engineer — Senior

Rethink

Nov. 2020 – Jul. 2021 Belo Horizonte, Brazil

- Worked on backend, developing the **Smiles** application, which is the mileage program for **Go!**, a major airline company.
- I utilized various technologies to deliver robust solutions, including **Node.js**, **Microservices architecture**, and **AWS** services such as **API Gateway**, **Lambda**, **SQS**, and **S3**. I also implemented unit tests using **Mocha** and **Chai** for ensuring code quality and reliability. Additionally, I employed **CI/CD** practices with **Jenkins** to streamline the development and deployment processes.

Backend Engineer — Mid-level

Raia Drogasil

Feb. 2020 – Nov. 2020 São Paulo, Brazil

- Developed backend solutions for pharmaceutical e-commerce applications, Drogaraia and Drogasil, utilizing **Node.js** with **GraphQL**.
- Created the Stix loyalty program, establishing a unified wallet that enables users to earn and redeem points for products across major supermarket and pharmacy chains in Brazil. Revamped the monolithic architecture of backend systems, transitioning to a microservices-based approach through integration using Node.js.

ABOUT ME

I hold a bachelor's degree in Computer Science with an exchange at the University of Oxford and currently pursuing a master's degree in Computer Science and Computational Mathematics. With a solid foundation in software development, I have accumulated 7 years of experience focusing on backend applications using javascript/typescript. Since I started my master's degree, I have dedicated my research to Remote Sensing, specifically exploring the utilization of deep learning models to predict socioeconomic indicators from satellite imagery. In addition to my technical expertise, I am a dynamic person who loves innovation. Entrepreneurship has always been an integral part of my professional journey, and I have successfully launched my own startup. It is part of my profile to think outside the box and seek creative solutions to complex problems.

EDUCATION

Master of Computer Science and Computational Mathematics,

University of São Paulo

Conclusion: Jul. 2024 Brazil

Bachelor of Computer Science,

Centro Universitário Euripedes de Marília

Dec. 2018 Brazil

Continuing Education

University of Oxford

May. 2018 England

Student in the extension course "Angular and React, the Tale of Two Javascript Frameworks".

AWARDS

- 6° SEVNA Acceleration Cycle (2019)
- 3° Startup Pitch Day - 1° PLACE (2018)
- Santander Ibero-Americano - 1° PLACE (2017)

LANGUAGES

Portuguese

English



SKILLS



- Contributed to the development team by providing technical guidance through pair programming, participating in task prioritization, and addressing bug fixes.
 - Played a key role in promoting and maintaining best development practices within the team and development chapter, including continuous integration, code reviews, automated tests, and facilitating application releases on Google Play and the App Store.
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Founder and Full-Stack Engineer

SEV Solutions

📅 Oct. 2017 – Dec. 2019

📍 Marília, Brazil

- As the founder of SEV Solutions, I led the development of an ecosystem centered around virtual attendants (chatbots) for restaurant social media. This included creating products like an order management dashboard and chatbots integrated with Facebook and Instagram for menu display and ordering.
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Full-Stack Software Engineer – Junior

ONCLICK Soluções Digitais

📅 Mar. 2016 – Jan. 2019

📍 Marília, Brazil

- As a full-stack developer, I actively participated in the construction of an ERP omnichannel order management system. My responsibilities encompassed utilizing **Vue.js** on the front end, **Node.js** on the backend, and **PostgreSQL** as the database.
- This involved integrating various customer marketplaces and utilizing messaging software such as **RabbitMQ** to facilitate seamless communication.