

JOAO VITOR BARROS DA SILVA

State College, PA

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Education

The Pennsylvania State University, University Park

B.S. in Computer Science, Minor in Entrepreneurship and Innovation

May 2026

Technical Skills

Programming & Development: Python, JavaScript, C, Ruby on Rails, Solidity, SQL (PostgreSQL), React.js, Next.js, Node.js, Firebase, APIs, HTML/CSS, Git/GitHub

Machine Learning & Cloud Technologies: TensorFlow, PyTorch, LangChain, Scikit-learn, Pandas, NumPy, Large Language Models (LLMs), AWS, Docker

Tools & Productivity: Figma, Jira, Notion, WordPress, HubSpot, Microsoft 365

Experience

Library Strategic Technologies | Penn State University Libraries

Oct 2025 – Present

Software Development Intern

State College, PA

- Developing and maintaining **Ruby on Rails** web applications for the **Penn State Libraries**, supporting **40K+** students and **faculty** across the university.
- Solving engineering tickets, performing code reviews, and collaborating in an **agile, test-driven** environment.

Blockchain Data Intelligence Lab | Penn State University

Feb 2025 – Present

Lead Researcher

State College, PA

- Developing **QLink**, a quantum-safe Layer-3 interoperability protocol integrating **Quantum Key Distribution (QKD)** and **Post-Quantum Cryptography (PQC)** to secure cross-chain blockchain bridges.
- Simulated a 7-validator QLink network over 5–50 km QKD fiber links, achieving up to **707× surplus key throughput** and **<1 s latency**, outperforming classical blockchain bridges by **>400×** in cross-chain key refresh rate.

Happy Valley LaunchBox | Penn State Startup Accelerator

May 2023 – Jul 2024

Innovation and Operations Intern

State College, PA

- Spearheaded the integration of **HubSpot CRM** with a new internal UI, centralizing engagement data for **40+ active startups** and improving reporting visibility by **45%**.
- Automated workflows using **AI in Power Automate** to handle email communications and data extraction, increasing team efficiency by **30%**.
- Judged multiple startup pitch competitions and provided strategic feedback to early-stage founders.

Projects

ZorAi – Full Stack Decentralized App | React, Node.js, Solidity, OpenAI

Mar 2025 – Present

- Built platform to **register and verify AI-generated images on the blockchain** to combat misinformation.
- Deployed BNB testnet dApp integrating **OpenAI API** for content analysis and **Pinata (IPFS)** for decentralized storage, verifying **5K+ AI-generated images** with **99% detection accuracy** and **<2 s verification latency**.
- Built **image detection layer** linking online media to on-chain AI records, reducing false positives by **40%**.

Insurance Cost Prediction | Python, Scikit-learn, XGBoost, Seaborn, Matplotlib

Jun 2025 – July 2025

- Designed and implemented an **end-to-end ML pipeline**, from data loading and cleaning to model evaluation.
- Benchmarked models including **XGBoost, Random Forest, Ridge, Lasso**, etc.; tuned with **GridSearchCV**.
- Achieved top performance with **XGBoost ($R^2 = 0.868$)**; reduced **MAE and MSE** by **35%** compared to baselines.

B3 Stock Clustering | Python, PCA, K-Means, GMM

May 2025 – June 2025

- Clustered **60+ Brazilian stocks** by price behavior using **K-Means and GMM** on normalized financial metrics.
- Applied **PCA** for dimensionality reduction, revealing four clusters (growth, income, small-cap, and blue-chip).
- Developed a **Jupyter-based pipeline** automating data fetching, preprocessing, and clustering.

Certifications

AI Agents with RAG & LangChain – IBM, Jun 2025

Deep Learning & Neural Networks – IBM, Jun 2025

AI & Blockchain Certificate – Google, May 2025

ML Web App with Streamlit – Coursera, Jun 2025

Machine Learning with Python – IBM, Jun 2025

Fake News Detection (ML) – Coursera, May 2025

Leadership / Extracurricular

Nittany Entrepreneur Society

Jan 2024 – Present

Web Development Team and Outreach

State College, PA

- Built and maintained club site (**WordPress → React**) showcasing events, merch, and **700+ member community**.
- Led **outreach efforts**, organized **workshops**, and coordinated **guest speaker events** to boost engagement.