Bruno Mariz O. Teixeira

Software Engineer

Rua Professor Mello Moraes, 2231 - Butantã, São Paulo - SP, 05587-070

(11) 99195-1663
bmarizot@gmail.com
https://www.linkedin.com/in/brunomariz/
http://lattes.cnpq.br/0792618608675007

Technical Skills

Python · C · C++ · MPI · CUDA · OpenMP · Git · Docker/Singularity · Numerical methods
Devito · Linux · AWS · Ansible · Proxmox · SLURM · LDAP · Lmod · Spack

Experience

Fluids & Dynamics Research Group / Software engineer and systems analyst
JAN 2024 - Present, Rua Professor Mello Moraes, 2231 - Butantã, São Paulo

The Fluids & Dynamics Research Group is a research laboratory in the Mechanical Engineering department at the Polytechnic School of the University of São Paulo, specializing, but not limited to, projects involving fluid mechanics and dynamic systems. The main activities carried out during this period were:

- Development of parallel and distributed code for seismic imaging applications. Skills developed: MPI, Devito, Python, C, C++, Docker/Singularity/Apptainer
- Management of a high-performance cluster aimed at scientific research. Skills developed: Distributed and parallel computing, SLURM, LDAP, Singularity, Lmod
- Administration of infrastructure and network services. Skills developed: Computer networks, Proxmox, Ansible, OpenVPN, LDAP

Websites: https://sites.usp.br/rcgi/br/home/, https://ndf.poli.usp.br

Semantix Inc / Software engineering intern
DEC 2021 - JUL 2023, Av. Eusébio Matoso, 1375 - Butantã, São Paulo

Semantix is a technology company focused on data engineering. The internship was carried out in the company's financial market oriented branch, called Semantix Financial. Some achievements from this period include:

- Creation of an online dashboard containing financial information to help investors make decisions. Skills developed: code review, application deployment on AWS, Docker, web scraping.
- Development of endpoints, validation schemes, and functionalities for a barter platform, integrating backend and database; Creation of screens and changes to components in the frontend, correction of errors, integration of the front and backend of the platform. Skills developed: Chalice (Python microframework for AWS serverless applications), SQLAlchemy, Docker, PostgreSQL, Postman and pytest automated tests; React, TypeScript.

Company website: https://semantix.ai/

KNOMA - Knowledge Engineering Lab / Undergraduate researcher
MAY 2019 - AUG 2020, Av. Prof. Luciano Gualberto, 380 - Butantã, São Paulo

During the research period at the KNOMA laboratory, the work was directed to a project that aims to accelerate the process of prospecting for oil and gas underground using parallel processing. Among the challenges of this period, the following stand out:

- Visualization of wave propagation in acoustic media. Skills developed: Python, Finite

Difference Method.

- Scalability analysis in parallel processing of different models for simulating wave propagation. Skills developed: Parallel programming, Python, Shell script, Linux, Docker.

Education

Escola Politécnica da Universidade de São Paulo (POLI-USP) /
MSc in Computer Engineering
SEP 2024 - Present, Rua Professor Mello Moraes, 2231 - Butantã, São Paulo

Currently pursuing a Master's in Computer Engineering with a research focus on accelerating 3D viscoelastic anisotropic full waveform inversion (FWI) algorithms. The work is part of the Avenir Project, sponsored by TotalEnergies, under the guidance of Prof. Edson S. Gomi at the NDF Lab (POLI-USP). The project aims to develop high-performance software tools for seismic imaging, leveraging the Devito DSL to discretize and optimize wave equations for FWI. Research activities include implementing and benchmarking different formulations of the acoustic and elastic wave equations on multi-GPU and multi-CPU architectures using Devito.

Escola Politécnica da Universidade de São Paulo (POLI-USP) /
Bachelor's Degree: Electrical Engineering - Emphasis on Computer Engineering
JAN 2019 - DEC 2023, Av. Prof. Luciano Gualberto, 380 - Butantã, São Paulo

Publications

- "Accuracy and Computational Efficiency of a 3D Viscoelastic Solver with Arbitrary Relaxation Mechanisms Using Devito DSL" extended abstract presented at the 86th EAGE Annual Conference & Exhibition - Wavefield Modeling 1 Track.
  Event website: https://eageannual.org/

- Teixeira, B., Gomi, E., Senger, H., Roberts, K., Freire de Souza, J., & Targino, J. (2020). "Comparison of Computational Cost between Different Sizes of Absorption Layers" paper presented orally at the Scientific Initiation Forum of the 11th High Performance Regional School of São Paulo (ERAD-SP).
  Event website: https://eradsp2020.ncc.unesp.br/

Awards

Best undergraduate research article for the work "Comparison of Computational Cost between Different Sizes of Absorption Layers", presented orally at the Scientific Initiation Forum of the 11th High Performance Regional School of São Paulo (ERAD-SP).
Event website: https://eradsp2020.ncc.unesp.br/premiados