Portugal
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Guilherme Lopes

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Work Experience

Protocol Engineer   **June of 2024 - Present**
Community Labs/Astro Labs

- Developed cross-chain bridge connecting Ethereum, Arweave, and AO using Solidity smart contracts, oracles, and MPC-based (C++) signing nodes enabling secure multi-network asset/data transfers.

Internship   **June of 2023 - September of 2023**
Nethermind

- Engaged in team meetings, contributing to discussions on project development and company operations.
- Gained insights into professional software development processes and blockchain technology trends.

Junior Researcher   **September of 2022 - September of 2023**
Release Lab   *University of Beira Interior*

- Conducted research on blockchain consensus protocols for a master's thesis, awarded a research grant for contributions to distributed systems.
- Authored an academic article on blockchains, gaining experience in formal academic writing and peer review processes.

Freelancer Software Developer   **October of 2019 - Present**
Multiple Companies

- Developed management tools/bots/API server solutions for diverse clients.
- Provided expert consultancy services, translating client needs into actionable software development plans.

Relevant Projects

Research on Blockchain Consensus Protocols (Master's Thesis)
- Implemented blockchain consensus protocols for Tezos, Proof of Work and Authority. Created tools, such as Bootstrapper and Live Testing Tool, using OCaml to enhance protocol creation, performance evaluation.

Arrow Distributed Directory Protocol and Distributed Database / Filesystem
- Implemented a distributed directory protocol node in Go with a live visualization tool for network state and access control, and later created a distributed database and filesystem using Rust and Libp2p to enhance efficient data storage and retrieval in a peer-to-peer network.

On-disk Key Value Database
- Engineered a key-value disk database in C, utilizing B-trees for optimized data management and access.

Language Design / Compiler
- Created Garbage Lisp, a Go-based interpreter and an OCaml-based Pascal to Assembly (X_86) compiler, demonstrating expertise in language design, parsing, and code generation.

Ethereum / EVM / Solidity
- Developed in Solidity a DEX with liquidity pool mechanics for token swaps and a game leveraging smart contracts for interactive gameplay, both deployed on the EVM.

Solana / Anchor / Rust
- Built a fully decentralized social network leveraging TypeScript and IPFS, and implemented a token holding platform with incentives, both utilizing Solana's blockchain capabilities.

Education

Master of Science (MSc) in Computer Science   **2021 - 2023**
Blockchain, Consensus Protocols, Compilers
University of Beira Interior (Top 3 in class)

Bachelor of Science in Computer Science   **2018 - 2021**
Distributed Systems (Best in Class)
University of Beira Interior

Skills

Programming	Go, OCaml, Rust, Python, Solidity, C/C++, Java, JavaScript, Bash, SQL, Assembly
Technical Skills	Linux, Git, Smart Contracts, Web Development, Libp2p, Data Structures/Algorithms, CI/CD, Containerization, Relational and Non-Relational Databases, RESTful APIs, Debugging and Troubleshooting, Web Development
Languages	Portuguese (native speaker), English (fluent), Spanish (beginner)

Interests

Technical Interests
Distributed Systems, Consensus Algorithms, Blockchains, Smart Contracts, Cryptography, Functional Programming, Compilers and Language Design, Computer Logic and Theory, Security of Systems and Software, Formal Language Verification, Operating Systems, Computer Security

Past Activities
Music Formation, Saxophone Classes (5 years)
Federated in Basketball (3 years)

Other Hobbies/Interests
Fishing, Beekeeping, Farming, Cycling

Awards and Events

Solana Breakpoint Conferences 2022 and 2023   **November 2023**
Received Student Fellowship Ticket
Lisbon, Portugal/Amesterdam, Netherlands

ICPC SWERC 2023   **February 2023**
South Eastern Europe Programming Competition
Politecnico Milano, Milan, Italy

MIUP 2022   **October 2022**
Portuguese National Programming Competition
Coimbra University, Coimbra, Portugal

Portfolio and Extras

Github Portfolio	Showcasing a diverse range of projects and open-source contributions, spanning blockchain protocols, distributed systems, and more. Visit: github.com/Gabulhas