

Emanuel Vieira

Software Engineer

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Software Engineer with 5+ years of experience developing systems and applications for distributed networks. Passionate about high quality, performance, stability and reliability.

SKILLS

Languages: ★★★: C/C++, Rust ★★: Bash, R, Python ★: JavaScript, HTML/CSS, WebAssembly, Go

Tools: Linux, Git, Docker, CMake/Make, GitLab CI/CD, ASN.1, Markdown, LaTeX, Vim

General: Communication protocols, Standards implementation, Consensus algorithms, Protocol stacks, Networking protocols, Cryptography, Telecommunications, Blockchains, Encoders/Decoders, Code generation, Research engineering

EXPERIENCE

Software Engineer

2020 - Present

Instituto de Telecomunicações

Aveiro, Portugal

- Lead development of fully standard-compliant vehicular communications (V2X) protocol stack for highly distributed vehicular networks (C/C++, Rust):
 - * Implementation of TLS, TCP, IPv6, MAC, LLC, 802.11p, and ETSI ITS protocols GeoNetworking, BTP, GN6ASL, and most Facilities-layer sub-protocols;
 - * Implementation of authentication, encryption, and PKI management cryptographic functions (OpenSSL);
 - * Implementation of communications with automotive HMI and backend services (MQTT, REST, Python);
 - * Development of new vehicular communications, tolling protocols, consensus mechanisms for efficient traffic;
 - * Linux device driver maintenance of radio hardware.
- Management and maintenance of team's infrastructure:
 - * GitLab, Nextcloud, and Mattermost servers. CI/CD pipelines and Linux package repositories;
 - * Deployed V2X roadside units;
- Mentoring of M.Sc. students;
- Participation in national and European research projects related with Cooperative-ITS.

Blockchain Researcher

2018 - 2020

Instituto de Telecomunicações

Aveiro, Portugal

- Implementation of various proofs-of-concept for IoT security and applications:
 - * SSI-based identity and cryptocurrency-based payments for road tolling (Hyperledger Indy, IOTA, Node.js);
 - * FPGA-enabled proof-of-work computing for direct IoT device participation in blockchain mechanisms (IOTA);
 - * OAuth-alternative authentication server based on SSI (Hyperledger Indy, Rust).
- Research of ZKP techniques for blockchain computations validation based on recursive proofs (C++, Rust);
- Systematic reviews on blockchains and consensus, for IoT security, SSI, and P2P energy trading mechanisms;
- Hosting of blockchain nodes (IOTA).

EDUCATION

Computer Science Ph.D.

2019 - Present

University of Aveiro

Aveiro, Portugal

Thesis topics: vehicular communications (V2X), distributed ledgers/blockchains, consensus, communication protocols, distributed networks, data security, cryptocurrency trading, cooperative maneuvers

Engineering Physics M.Sc.

2011 - 2017

University of Aveiro

Aveiro, Portugal

Dissertation topics: complex networks, statistics, simulations

Bachelor's project topics: financial markets forecasting, statistics, machine learning

CONTRIBUTIONS

Open-source contributions

Dozens of pull requests for new features and bug-fixing in major open source telecommunications and computer networking software. More info. on [GitHub](#).

Scientific contributions

Published 12+ papers on blockchains, vehicular communications, totalling 150+ citations. More info. on [Google Scholar](#);