Eduardo **Rodríguez Sánchez**

COMPUTER ENGINEER · HPC MASTER STUNDENT

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"Forty-two, said Deep Thought, with infinite majesty and calm."

Education

UNILU(Université du Luxembourg)

Belval, Luxembourg

M.S. IN HIGH PERFORMANCE COMPUTING — *Sep. 2025 - May 2026*

- Currently in my first semester under the program EUMaster4HPC for a double degree.
- I will spend my first year on Université du Luxembourg, and the second year in Sofia University St. Kliment Ohridski.

GT(Georgia Insitute of Technology)

Georgia, USA

B.S. IN COMPUTER SCIENCE — *Aug. 2023 - May. 2024*

- Comprehensive knowledge of computer systems architecture and implementation with focus on distributed computing environments.
- Proficient in systems-level programming and designing robust networked applications for modern computing infrastructures.
- Relevant coursework: Advanced Operating Systems, Embedded Systems, Database implementation and Cyber Security.
- GPA: 4/4

UC3M(Universidad Carlos III de Madrid)

Madrid, Spain

B.S. IN COMPUTER ENGINEERING — *Sep. 2020 - Jun. 2023*

- Solid foundation in mathematics and statistics; as well Artificial Intelligence, Software Engineering, Cyber Security, among many others.
- Completed capstone project: Developed project HERMES (High Performance Enginer for Routing and Mirroring Encrypted Streams) in C++, a proxy for load-balancing millions of connections within an internal network.
- Courses include: Operating Systems, Networks, Distributed Systems, Computer Architecture, Software Engineering, Machine Learning and Cryptography.
- GPA: 9.1/10

Skills

Low-level / Systems	Linux, Virtualization, CPU Architecutre, GDB, Valgrind
High-Performance Computing	Multithreading, Vectorization (AVX), Profiling, Benchmarking
Distributed Systems	Kubernetes, Load Balancing, Distributed Storage, 5G Networking
Observability / Monitoring	Grafana, Prometheus, gRPC
Programming	C, C++, Go, Python
Languages	Spanish, English

Experience

Ericsson

Madrid, Spain

SOFTWARE DEVELOPER — *Dec. 2024 - Aug. 2025*

- **5G Core Research and Development:** Developed features for User Plane Analytics and optimization in 5G core networks, including antenna geo-redundancy algorithms, multi-thread contention reduction, and resolution of trouble reports such as segment violation errors.
- **5G RIB Solution Design:** Led the migration and adaptation of a 5G Routing Information Base (RIB) codebase from a remote team to our Madrid office. Redesigned the implementation to enable intra-forward communication between modules within the Kubernetes network, eliminating reliance on external networks or the internet.

Samsung Electronics (Zhilabs)

Madrid, Spain

SOFTWARE ENGINEER — *Jun. 2023 - Oct. 2024*

- **Recursive Descent Binary Parser for Network Traces:** Developed a fully functional recursive descent binary parser to efficiently access and collect network error data from traces. Enhanced system performance by providing quick and reliable data extraction for troubleshooting and network optimization.
- **Parallel Network Traffic Simulation:** Upgraded an existing network traffic simulator from sequential execution to parallel simulation across multiple antennas, significantly improving performance and enabling scalable testing of network scenarios.
- **High-Performance Network Trace Proxy:** Designed and implemented a high-performance proxy for network traces, achieving 86 Gb/s throughput for unencrypted packet forwarding. Presented as Bachelor's Thesis during Summer 2024.
- **RAN (Radio Access Network) Assistant:** Participated from PoC stage, designing and implementing a multi-agent system leveraging LLM, NLP, ML, and heuristics. Features included Telco Q&A, anomaly detection, root cause analysis, and solution proposal.

Research

SnT (Interdisciplinary Centre for Security, Reliability and Trust)

Kirchberg, Luxembourg

Research Assistant

Oct. 2025 - Present

- Developing and maintaining prototypes of Byzantine fault-tolerant consensus systems for research evaluation.
- Implemented a PBFT-based replica prototype in C++ on top of an asynchronous networking stack, focusing on correctness and performance.
- Contributing to the design and implementation of a consensus protocol for coordination across replica groups.
- Built tooling and test scenarios to validate behavior under failures and measure performance in reproducible experiments.

Projects

Rule110 Fast

github.com/nekronos-gh/rule110

- Optimized Rule 110 simulation using AVX2 SIMD intrinsics.
- Maximised memory throughput via memory alignment and OpenMP multi-threading.
- Utilized hardware directives and C++23 features for efficient state analysis.

TinyFile

github.com/nekronos-gh/TinyFile

- Developed a file compression service using a hybrid IPC architecture combining POSIX Message Queues control signals and Shared Memory for data transfer.
- Engineered a state-machine based Ring Buffer to manage concurrent data chunks, utilizing zero-copy memory access between the client library and daemon service.

PBFT

github.com/nekronos-gh/pbft-cpp

- Implemented Practical Byzantine Fatult Tolerance (PBFT) proctocol in C++ using Salticidae for network connection, together with prometheus and grafana for monitoring.
- Three phase conensus protcol (pre-prepare, prepare and commit phases), that handles primary errors through view changes.
- Included state checkpointing for garbage collection and state synchronization.