

Tiago Almeida

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Education

University of Coimbra Coimbra, Portugal

Master's in Cybersecurity (Grade: 18/20) 2024 – 2026

MSc Thesis (19/20): *Automated Patch Generation for Software Vulnerabilities Using Large Language Models*

Advised by Prof. Ibéria Medeiros and Prof. João R. Campos, CISUC Software and Systems Engineering group

University of Coimbra Coimbra, Portugal

Bachelor's in Computer Science 2021 – 2024

Publications

EXPLOITFORGE: Building and Validating Curated Exploit Datasets from Real-World Software Vulnerabilities

T. Almeida, I. Medeiros, J. Pereira, J. R. Campos. Submitted to 34th IEEE SANER 2027, Tools and Artifacts Track.

Experience

CISUC – Centre for Informatics and Systems, University of Coimbra Coimbra, Portugal

Researcher (Full-Time) Sep 2025 – Sep 2026

Designed and implemented a five-phase, project-agnostic pipeline for automated security-patch generation on C/C++ software: dataset construction, containerised reproduction, context-aware LLM patch synthesis, multi-layered validation combining PoC execution with static analysis and an iterative feedback loop

Evaluated on glibc, OpenSSL and tcpdump across eight LLMs: of 361 vulnerabilities, 178 confirmed reproducible (oracle precision 0.961, recall 0.980), yielding 924 validated patches, 48.5% passing first validation. Repair success proved strongly defect-dependent, from 60.8% of tcpdump's validated vulnerabilities to 6.7% on OpenSSL

Built EXPLOITFORGE, the language-agnostic dataset and reproduction component: links NVD CVEs to fix commits, curates PoC exploits with LLM-assisted repair, then re-executes each in an era-matched Docker container against the vulnerable and patched trees. Released open source with the audited dataset

Benchmarked hosted against self-hosted models: the strongest model used repaired at roughly 3 cents per vulnerability, while self-hosted 32B-parameter models reached just under half that yield at no marginal cost

University of Coimbra Coimbra, Portugal (Remote)

Instructor (Freelance) Mar 2026 – Jun 2026

Designed and delivered a course on Security, Privacy and Digital Fraud on Social Networks to 115 participants, covering threat modelling, privacy practices and fraud prevention for non-technical audiences

Associação Académica de Coimbra (AAC) – Direção-Geral Coimbra, Portugal

Head of IT Department 2024

Co-authored the Digital Transition Action Plan (PATD) 2023 – 2030, a 248-page infrastructure and digitalisation strategy for the association: five intervention axes, ten strategic objectives and a five-phase rollout, benchmarked against roughly 30 national and international frameworks from AMA to the OECD

Led the IT department and a team of 7 running digital infrastructure for Portugal's largest student association (30,000+ members)

Leadership & Activities

Queima das Fitas de Coimbra & Festa das Latas e Imposição de Insígnias Coimbra, Portugal

Festival Supervisor · Deputy General Coordinator · Department Head (9 editions) 2022 – 2026

Nine editions across both festivals, rising from collaborator (2022) to department head (2023), festival supervisor over the general coordinator and his team (Queima 2024), second-in-command (Latada 2024) and third-in-command for partnerships, logistics and access (Queima 2025)

Sponsor and advisor since, contributing access-control and beverage stock management software I built and deployed

WebSummit Lisbon, Portugal

Volunteer / Volunteer Leader 2021 – 2022

Led an on-site volunteer team and supported press coordination at one of the world's largest tech conferences

Skills & Interests

Languages: C, Python, Bash, SQL

Tooling: Docker, Git, GDB, Valgrind/AddressSanitizer, GCC/Clang toolchains, Make/Autotools, Linux

Security: CVE/NVD analysis, PoC exploit curation, vulnerability reproduction, automated program repair, threat modelling

AI/ML: OpenAI/Anthropic APIs, Ollama · **Other:** project management, team coordination, stakeholder relations, technical writing

Spoken: Portuguese (Native), English (C1 Cambridge), Spanish (Intermediate)