Diogo Peralta Cordeiro

Computer scientist · software systems · technical leadership · applied research

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Profile

I am a computer engineer from Porto, Portugal. My path into computing began in 2010, shortly after I first got access to a computer: I learnt programming logic, then C, and wrote small scripts to make tedious tasks disappear. The years that followed were spent around UNIX, multimedia and programming — first as a hobby, then as a degree, now as a profession.

I read Computer Science at the University of Porto and am currently a PhD candidate in Electrical and Computer Engineering at its Faculty of Engineering, where my work sits at the intersection of machine perception, interaction design and dependable systems. Alongside research, I provide systems analysis, strategic consulting and tailored training through Apontamento Cordial.

Away from the keyboard, I enjoy music, art and old TV shows, as well as tennis, jazz and contemporary dance, books, board games and time with friends.

Selected Impact

Technical leadership across research and production

Software, systems and research contexts

Engineering ownership. Led funded open-source platform development, coordinated contributors, made architectural decisions, and maintained a public-facing technical roadmap.

Research-to-system translation. Worked across dependable computing, robotics, machine perception and spatial interaction, keeping practical deployment constraints in view.

Project and program execution

Milestones, stakeholders, risk and delivery

Execution discipline. I structure projects around clear goals, written decisions, risks, interfaces and incremental delivery.

Stakeholder fluency. I can communicate with engineers, researchers, students, institutional partners and non-technical decision-makers without losing technical precision.

Teaching, mentoring and curriculum design

Computer Science and engineering education

Teaching practice. Delivered workshops and talks on Git, dependable computing, embedded systems and decentralised networks.

Pedagogy. Completed evidence-based undergraduate STEM teaching training and a Portuguese trainer certification, with a focus on active learning and practical technical competence.

Experience

Systems Analyst

2022-03 – present

Apontamento Cordial

Strategic consulting. I conduct in-depth analyses of existing systems and processes, identify improvement opportunities, and recommend strategic solutions that raise productivity.

Tailored training. I design and deliver customised training programmes that meet the specific needs of client companies, equipping teams with the knowledge and skills to use technology effectively and fostering a culture of continuous learning.

Client-centric collaboration. I work closely with clients to gain a deep understanding of their needs and objectives, ensuring that training and consulting services align seamlessly with their strategic goals.

Dependable Computing in the Aerospace Sector

2022-09 – present

University of Porto

In September 2022 I joined the **ANTAEUS** project as a member of the on-board data-handling (OBDH) team. Our mission is to design and launch a 2U CubeSat to perform scientific measurements in the 100 keV – 10 MeV energy band and to validate a 2U instrument for future space high-energy astrophysics observatories. The project is led by the University of Coimbra in partnership with the Laboratory of Instrumentation and Experimental Particle Physics (LIP) and the University of Beira Interior. Its main scientific and technological conclusions will contribute to enhanced instrumentation for M-class high-energy astrophysics mission proposals in which the University of Coimbra participates, as well as to high-energy astrophysics based on a CubeSat constellation.

In October 2023 I became a supervisor of the **Porto Space Team** student society, having joined in July 2022 as head of its Department of Software and Computer Engineering, responsible for data handling in project **INVICTUS** — a hybrid-propellant (H3 category) rocket for the European Rocketry Challenge (EuRoC 2023), targeting a 3 000 m apogee and a safe parachute-assisted recovery.

Lead Software Engineer

2019-01 – 2022-09

GNU social — the free-software social networking platform

GNU social is social communication software written in PHP for public and private communications. It is widely supported, counts the Free Software Foundation among its users, and connects a free network of thousands of communities. Project website: gnusocial.rocks.

In February 2021 I received funding through the European Union's Horizon 2020 research and innovation programme, under the NGI0 Discovery Fund grant agreement No 825322 (2021-02 to 2022-02), to lead the development of **version 3**, which features a high degree of accessibility, customisation and expansion via plugins. The fund is a European Commission initiative that aims to shape the Internet into an Internet of Humans.

In January 2021 I designed the new architecture for v3, guided the development of the new major release, introduced a new data representation and a new attachment mechanism, and ported much of v2 to v3.

Another highlight from 2021 was authoring FEP-2100, which allows ActivityPub actors of type "Group" or "Organization" to follow other such actors.

Research Intern, Multimedia Communications Technologies

2022-06 – 2022-07

Centre for Telecommunications and Multimedia (CTM), INESC TEC

With the advent of machine-learning methods there has been extensive research in human detection, tracking and activity recognition. Inherent to this is the analysis of human pose using skeleton models that connect information extracted from the scene to the human body — information that parametric human models can also use to create virtual 3D representations.

During this internship I surveyed the state of the art in parametric human-body models, implemented the infrastructure required to test them, and produced a final analysis and comparison. The work was **distinguished as the best of the MCT category** by the jury of the Summer@CTM 2022 internship programme.

Robotics Engineer (research internship)

2020-08 – 2020-10

Underwater Systems and Technology Laboratory (LSTS), FEUP

Supported by a research grant (BII) from the Portuguese Foundation for Science and Technology. Our interdisciplinary student team further developed a low-cost autonomous surface vehicle, designed a docking station, and began work on a manoeuvre to enable autonomous docking in the LSTS toolchain. The manoeuvre uses a vector-field guidance algorithm to find the optimal trajectory and, when close to the station, tracks a target with the camera module. The vessel uses an IMU, a GPS, a camera and a Raspberry Pi 4.

Mentor / Director of Studies

2019 – 2021

GNU social

Organised **Google Summer of Code** (GSoC) at GNU social in 2019 and 2020, mentoring four students, and organised GNU social Summer of Code — a community-funded programme modelled on GSoC — mentoring one student in 2020. In the autumn term of 2020, GNU social was one of the projects in FEUP's Software Development Laboratory master's module (MIEIC-LDSO), where I helped mentor eight fourth-year informatics-engineering students.

Selected contributions with mentored students:

- 2020-03-31 to 2020-09-08, as GSoC mentor of two students:
  - *Full core rewrite* — modernise the codebase by replacing unmaintained libraries and redesigning the framework on Symfony instead of PEAR.
  - *New frontend* — a modern frontend improving UI and UX, reviewing every controller for optimised queries and caching.
- 2019-04-27 to 2019-08-26, as GSoC mentor of two students:
  - *Network services improvements* — OpenID support, URLMapper, fluid transitions between federation protocols, and

further ActivityPub development (queues, collection caching, audience targeting, inbox forwarding, groups).
- *Optimisations on load balancing and storage* — improved media handling, refactor of the Embed plugin, Redis support, improvements to Memcached support.

Google Summer of Code is a global programme focused on bringing more student developers into open-source software development through a three-month project with an open-source organisation.

Education

PhD in Electrical and Computer Engineering

2022-09 – present

Faculty of Engineering, University of Porto

Supervisor: Prof. João Tasso de Figueiredo Borges de Sousa.

Specialisation: Automation Engineering. **Field of study:** information engineering, computer science, intelligent systems, robotics, systems and control.

Coursework: real-time embedded systems, intelligent mobile robotics, network science, computer vision.

Activities and societies:

- Supervisor of Porto Space Team (2023-10-03 → present)
- Member of the ANTAEUS CubeSat project (2022-09-21 → present)
- Member of Porto Space Team (2022-07-12 → 2023-10-03)

BSc in Computer Science

2017-09 – 2022-09

Faculty of Sciences, University of Porto

180 ECTS, of which 54 ECTS in Mathematics.

Activities and societies:

- Member of EUGLOH's Joint Curricula Design work package and Student Board (2020-07-13 → 2021-07-30)
- Member of the Faculty of Sciences' Pedagogical Council (2019-11-05 → 2022-06-17)
- Freshers' teaching assistant for the Computer Science Department (2019-09-10 → 2021-07-30)
- Founding member of the Hackers at Porto student society (since 2017-11-01)

Key contents:

- Mathematics — numerical analysis, stochastic processes, operations research, linear algebra, analytic geometry, multivariable calculus, differential equations
- Computing theory — graphs, logic and proof, computability, complexity, reactive systems
- Computer systems — computer architecture, computer networking, operating systems
- Programming — compiler construction, advanced algorithms and data structures, multiprocessor programming
- Applications and professionalism — intelligent systems, interaction design, security, privacy, databases
- Electrical engineering — automatic control, digital signal processing

Exchange studies — Societal Resilience (7.5 ECTS)

2020-09 – 2020-10

Lunds Tekniska Högskola (LTH), Lund University — Erasmus+/EUGLOH

Disaster-risk management and climate-change adaptation for a safe and sustainable society, with case-study seminars and role-play.

Exchange studies — Entrepreneurial Skills (1.5 ECTS)

2021-10 – 2021-12

Lund University School of Economics and Management (LUSEM) — Erasmus+/EUGLOH

Development process of an entrepreneurial project, the entrepreneurial mindset, and team dynamics; concluded with a two-day Global Health hackathon, which my team won.

Specialised Training

CubeSat Concurrent Engineering Workshop 2023

2023-02 – 2023-02

ESA Academy, ESA ESEC

A training session introducing university students to the concurrent design of a CubeSat mission. Guided by ESA experts, students learn to use COMET (Concurrent Model-based Engineering Tool) and to identify design drivers; divided into teams, they first create a subsystem concept and then realise an identified mission concept, function tree and product tree using concurrent engineering.

Key topics:

- Introduction to concurrent engineering, systems engineering and requirements — Robin Biesbroek
- CubeSat missions and technologies — Camille Pirat
- CubeSat architectures — Ilja Skrypnyk
- Increasing RAMS for CubeSats — Silvana Radu

Fly Your Satellite! Design Booster — Training Week

2022-11 – 2022-11

ESA Academy, ESA ESTEC

ANTAEUS, a prospective Fly Your Satellite! Portuguese team, attended this training week to deepen its knowledge of spacecraft design and project management.

Covered topics included: project management principles and COTS; legal aspects of CubeSat missions; communications and outreach; systems engineering principles; AIV and testing; introduction to MBSE; data-handling subsystem design and verification; flight-software development; EPS design and verification; structural, thermal and mechanisms design and verification; project management for CubeSats; AOCS design and verification; spacecraft operations; TT&C and ground segment; RAMS of CubeSats (FMEA, HSIA, FDIR); space-debris mitigation and trackability; and CubeSat mission analysis — delivered by ESA specialists including Alexander Kinnaird, Tomasz Szewczyk, Volkan Salma, Silvana Radu and David Evans.

Startups School

2020-11 – 2021-06

UPTEC — Science and Technology Park, University of Porto's business incubator

Three-month programme preparing entrepreneurs to create and develop a new business project.

Certifications & Micro-credentials

Pedagogical Competences Certificate (CCP)

2024-02 – present

IEFP — Portuguese Employment and Vocational Training Institute, and CRIAP Institute

Trainer-of-trainers certification. Final grade: 5 — Excellent. Credential F751769/2024.

ECSS E-40 Software Engineering

2023-03 – present

ESA Training on ECSS

Managing software projects for space and ground applications under the ECSS E-40 standard.

Transferable Skills for Engineering: Pedagogical Training (1.5 ECTS)

2022-12 – present

Faculty of Engineering, University of Porto

Pedagogical preparation of a course, learning objectives, strategies for large classes and learning assessment.

Cambridge English Level 2 Certificate in ESOL International — C1 (CEFR)

2021-10 – present

Cambridge Assessment English

Credential ID *B6703928*. Scores: Reading 200 (grade A, C2); Use of English 201 (grade A, C2); Writing 190 (C1); Listening 193 (C1); Speaking 195 (C1).

Seminars, Presentations & Workshops

Introduction to Git: Mastering Version Control

2023-06 – present

Symposium on Electrical and Computer Engineering, DCE23 — Doctoral Congress in Engineering, University of Porto

Hands-on workshop on version control, from rsync/diff/patch and RCS/SVN history to Git internals and etiquette.

Dependable Computing

2023-05 – present

Faculty of Engineering (via Porto Space Team) and Faculty of Sciences (via NuCC-FCUP and Hackers at Porto), University of Porto

One-hour talk on model-driven development, hard real-time systems, RAMS and safeguard mechanisms in space avionics.

Real-time Embedded Systems

2023-02 – present

Spaceway — "Software & Data Engineering in Space" online course

Four-hour lecture: real-time modelling and scheduling, RTOS, RAMS, architectures and memory management.

ANTAEUS — Computing in Space 2023-02 – present

Jornadas do Espaço — do Laboratório para a Órbita, Universidade da Beira Interior

One-hour talk using the ANTAEUS CubeSat as the case study for dependable on-board computing.

Algorithms — Documentary TV Series, Ep. 4: Public Space 2022-11 – present

RTP 3, television

Discussed the impact of algorithmic decisions on the content we consume and the public discussions we have.

GNU social v3 and Unbound Actors 2022-05 – present

15th U.Porto Young Researchers Meeting (IJUP)

A presentation of FEP-2100 — its context and how we created it. **Distinguished as the Best Oral Communication in the Engineering area** of this edition.

Honours, Awards & Grants

Best work — Multimedia Communications Technologies, Summer@CTM 2022 2022-07 – present

INESC TEC

My internship on parametric human-body models was distinguished as the best of the MCT category by the jury of the Summer@CTM 2022 internship programme.

Best Oral Communication — Engineering 2022-05 – present

15th U.Porto Young Researchers Meeting (IJUP 2022)

"GNU social v3 and Unbound Actors" was distinguished as the best oral communication in the Engineering area.

NGI0 Discovery Fund grant 2021-02 – present

European Union Horizon 2020 — grant agreement No 825322

Funding awarded through the EU's Horizon 2020 research and innovation programme (2021-02 to 2022-02) to lead the development of GNU social v3.

Best team — Global Health hackathon 2021-12 – present

Lund University School of Economics and Management (EUGLOH)

Our team ranked best among six in the two-day hackathon closing the Entrepreneurial Skills module.