Miguel Peixoto

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Experience

- **Keenfinity (Bosch Spin-off)** — Portugal
  AI Architect — *Feb 2025 – Present*
  - **Leadership**: Leading team of data, frontend and backend engineers across 16 projects in 7 departments.
  - **Projects**: Training LLMs from scratch, deploying GenAI frontends/backends, autoencoders for anomaly detection, PDF information extraction/classification/clustering, automatic ticketing with Agentic LLMs, Computer Vision for factory traceability, on-premises system design on 30+ linux machines for sensitive applications.

- **Bosch Security Systems** — Portugal/Germany
  Boost Program - Machine Learning Engineer — *Aug 2023 – Feb 2025*

  Selected as 1 of 8 from 900+ applicants for Portuguese JMP. Mentored by Sergio Salústio, Director of R&D.
  - **Computer Vision**: Designed and deployed a computer vision and object detection system for real-time factory material tracking, optimizing logistics and reducing inefficiencies. Solution scaled to 3 factories globally.
  - **Embedded ML**: Full ML lifecycle on embedded devices: Data engineering, training, finetuning, distilation, quantization, pruning, compilation and firmware deployment.
  - **AI Solutions**: Engaged stakeholders to identify use cases and deploy solutions while ensuring data governance.

- **University of Minho** — Braga, Portugal
  Researcher — *May 2023 – Dec 2024*
  - **Industry**: Collaborated with Bosch Car Multimedia to advance anomaly detection in industrial applications.

- **Instrumentation and Experimental Particle Physics Laboratory** — Braga, Portugal
  Researcher — *Oct 2021 – Present*

  Led team of 10 students specializing in anomaly detection and quantum computing for high-energy physics.
  - **NLP & Healthcare**: Collaborated with SPAC Lab on disease diagnosis model using Portuguese National Health Service records. Implemented HuggingFace Sentence-Transformers and Facebook Faiss for similarity search.
  - **Quantum ML**: Compared Quantum ML architectures with classical methods. Developed robust library with parallelization, unit tests, CI/CD pipelines using Pennylane, Qiskit, PyTorch, and Optuna.
  - **Education**: Facilitated machine learning workshops and seminars for research institute students.

- **Instrumentation and Experimental Particle Physics Laboratory** — Braga, Portugal
  Summer Intern — *Apr 2020 – Oct 2021*
  - **Research Projects**: Advanced data analysis for dark matter research (2020) and Anomaly Detection for New Physics Discovery at CERN's Large Hadron Collider (2021).

Education

- **University of Minho** — Braga, Portugal
  Master's Degree in Information Physics; Grade: 20.0/20.0
  - **Thesis**: Anomaly Detection as a Quality Control Tool in an Industrial Context. Created production-ready AutoML autoencoder framework validated at Bosch Braga that can detect any anomaly using only defect free data. Outperformed SOTA on MvTec benchmark. Supervised by Prof. Nuno Castro, Director of LIP and RCNA.
  - **Role**: Student representative of master's program

- **University of Minho** — Braga, Portugal
  Bachelor's Degree in Physics Engineering; Average Score: 16.4/20.0
  - **Leadership**: Founded NEFUM Discord community (200+ members), organized national physics students meeting (134 attendees), ran for association president.
  - **Skills Development**: Member of Academic Debate Association, developing communication and analytical skills.

Publications

- **Fitting a Collider in a Quantum Computer**: Tackling the Challenges of Quantum Machine Learning for Big Datasets. Frontiers in Artificial Intelligence, 2022. DOI: 10.3389/frai.2023.1268852

Awards & Honors

- **15th Fraunhofer Portugal Challenge**: Outstanding innovation in technological research for master's thesis.
- **UMinho University Award**: Initiation in Scientific Research award for Variational AutoEncoders anomaly detection system in high-energy physics. [University Media Link] [Local Newspaper]
- **Empreende@Villa.Jovem-BILATECH**: 1st place and 5k€ prize among 30+ finalists in the contest aimed at young entrepreneurs for innovative business idea in marketing automation.
- **Meritorious Behavior Award**: Awarded 4 distinctions at the end of high school due to my participation in "Project Rocket" and my seminar on the Noble Prize of Physics 2017 promoted by UTAD University.

Social and Political Activities

- **European Researchers' Night - LIP Presentation** Braga, Portugal
  Science Outreach Presenter *2022, 2023*

  Presented SOTA physics research to the public, promoting scientific literacy and inspiring next generation of researchers.
- **iQuHACK MIT Hackathon** Cambridge, MA, USA
  Quantum Computing Participant *2022*

  Developing innovative solutions using IonQ's quantum hardware and advancing quantum algorithm development skills.
- **ESA Winter Astronomy Camp** Saint-Barthélemy, Italy
  Selected Participant *2019*

  Selected as 1 of 40 participants from 500+ worldwide applications for an astronomy program on exoplanet research, engaging lectures, hands-on observatory activities, and nighttime observations.