Nelson Aloysio Reis de Almeida Passos

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Machine learning researcher and software engineer with over ten years of experience, passionate about free and open-source software. My work spans the design and implementation of large-scale data collection and processing pipelines, analytics dashboards, and GPU-accelerated algorithms and neural networks. I am committed to high-quality, reproducible research, with a focus on complex network analysis for industrial and scientific applications.

EXPERIENCE

2026 – now **Postdoctoral Researcher**, High Performance Computing Laboratory – Institute of Information Science and Technologies, National Research Council of Italy (CNR-ISTI).
- Researching spectral methods and graph neural networks for learning on temporal graphs
- Developing GPU-accelerated algorithms for large-scale network analysis

2022 – 2026 **Doctoral Researcher**, National PhD in Artificial Intelligence – University of Pisa, Department of Informatics / High Performance Computing Lab (CNR-ISTI), Italy.
- Designed high-performance algorithms and machine learning models for clustering temporal graphs
- Built NetworkX-Temporal, TADC-SBM, and the LMoN graph neural network

2021 – 2022 **Research Engineer**, SouCiência Institute, Federal University of São Paulo, Brazil.
- Built data processing pipelines for text and tabular data in interdisciplinary research projects

2020 – 2021 **Machine Learning Engineer**, Culture Hack Labs, Canada.
- Built NLP pipelines for topic modeling and entity recognition
- Integrated semantic and large-scale network analysis into an analytics dashboard for the cultural sector

2018 – 2019 **Back-end Software Developer**, The Rules, USA.
- Developed web crawling, clustering, and network analysis pipelines for a communications dashboard
- Supported research and policy work on trends in public social network activity

2016 – 2017 **Data Engineer**, Private client, Ecuador.
- Built and deployed automated data collection and processing pipelines as sole developer
- Enabled daily reports from public news and social network data during a national election

2014 – 2017 **Research Assistant**, Laboratory of Internet and Data Science (Labic), Federal University of Espírito Santo, Brazil. *2013*: Research Volunteer.
- Developed social network analysis and OSINT tools for large-scale datasets
- Built analytic tools for public-sector stakeholders, including UNICEF and Brazil's Ministry of Education

EDUCATION

2022 – 2026 **Ph.D. in Artificial Intelligence**, University of Pisa, Italy.

2019 – 2022 **M.Sc. in Social Sciences**, Federal University of Espírito Santo, Vitória, Brazil.

2018 – 2021 **Pg.Dip. in Data Science with Big Data**, Federal Institute of Espírito Santo, Serra, Brazil.

2011 – 2018 **B.Sc. in Social Communication**, Federal University of Espírito Santo, Vitória, Brazil.

PROJECTS

2024 – now networkx-temporal.org – Library for temporal graphs with GPU support. 60,000+ downloads.

2024 – now nautilus-typeahead – Type-ahead search for GNOME Files on Fedora COPR (x86_64, aarch64).

2023 – now Graph tooling – Synthetic benchmarks, datasets, and I/O libraries for network analysis in Python.

2022 build-kmod-rpm – Signed NVIDIA kernel modules for Fedora Atomic desktops with Secure Boot.

2021 NLP dashboard – Drag-and-drop analytics for text, tables, and images with Streamlit (live demo).

SKILLS

Python PyTorch/PyG, TensorFlow, scikit-learn, NumPy/SciPy, CuPy, NVIDIA RAPIDS (cuML, cuGraph), NetworkX-Temporal (author), graph-tool, igraph, NetworKit, Pandas/Dask

Systems Linux/Shell, Slurm, Docker/Podman, Kubernetes, Airflow, AWS, Google Cloud, SQL and NoSQL (PostgreSQL/MySQL, MongoDB), graph databases (Neo4j, ArangoDB)

Languages Portuguese (native), English and Italian (fluent), Spanish and French (reading)