

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

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| 2026 – now | Postdoctoral Researcher , High Performance Computing Laboratory – Institute of Information Science and Technologies, National Research Council of Italy (CNR-ISTI). <ul style="list-style-type: none">Researching spectral methods and graph neural networks for learning on temporal graphsDeveloping 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 Laboratory, Italy. <ul style="list-style-type: none">Designed high-performance algorithms and machine learning models for clustering temporal graphsBuilt NetworkX-Temporal, TADC-SBM, and the LMoN graph neural network |
| 2021 – 2022 | Research Engineer , SouCiência Institute, Federal University of São Paulo, Brazil. <ul style="list-style-type: none">Built data processing pipelines for text and tabular data in interdisciplinary research projects |
| 2020 – 2021 | Machine Learning Engineer , Culture Hack Labs, Canada. <ul style="list-style-type: none">Built NLP pipelines for topic modeling and entity recognitionIntegrated semantic and large-scale network analysis into an analytics dashboard for the cultural sector |
| 2018 – 2019 | Back-end Software Developer , The Rules, USA. <ul style="list-style-type: none">Developed web crawling, clustering, and network analysis pipelines for a communications dashboardSupported research and policy work on trends in public social network activity |
| 2016 – 2017 | Data Engineer , Private client, Ecuador. <ul style="list-style-type: none">As sole developer, built and deployed automated data collection and processing pipelinesEnabled 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. <i>2013</i> : Research Volunteer. <ul style="list-style-type: none">Developed social network analysis and OSINT tools for large-scale datasetsBuilt analytic tools for public-sector stakeholders, such as UNICEF and Brazil's Ministry of Education |

EDUCATION

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| 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

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| 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 | PyPI packages – Synthetic graph generators, datasets, and I/O tools for network analysis tasks. |
| 2022 – 2023 | build-kmod-rpm – Signed NVIDIA kernel modules for Fedora Atomic desktops with Secure Boot. |
| 2020 – 2021 | NLP dashboard – Drag-and-drop analytics for text, tables, and images with Streamlit (source). |

SKILLS

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