

Luiz Augusto Facury de Souza

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Education

- Universidade Federal de Minas Gerais (UFMG)**, MSc in Computer Sciences Jan 2025 – Present
- Research in Self-Supervised Learning methods for world models.
 - Coursework: Deep Learning, Computer Vision, Project and Analysis of Algorithms.
- Télécom Paris (IP Paris)**, Master of Science in Engineering Sept 2022 – Sept 2024
- Double Degree Program with Specializations in Data Science, Image Processing and Artificial Intelligence, taught in English and French
 - Coursework: Deep Learning, Statistics, Databases, Optimization, Programming Paradigms
 - End-of-studies project on Self-Supervised Deep Segmentation awarded 19/20, resulting in a publication at MIDL.
- Universidade Federal de Minas Gerais (UFMG)**, BS in Electrical Engineering Aug 2018 – Dec 2024
- Specialization in Machine Learning and Computer Engineering
 - Coursework: Machine Learning, Software Engineering, Operational Systems, Electronics.

Experience

- Researcher I**, Petrobrás (Brazilian Oil Company) – Belo Horizonte, Brazil Jan 2025 - Present
- Created a framework capable of finding and segmenting a region of interest for geologists to find oil, which resulted in 2 papers submitted for relevant journals.
- Researcher**, SPEED Lab (UFMG) – Belo Horizonte, Brazil Aug 2024 - Present
- Development of models for the Hospital of Clinicians of the Federal University of Minas Gerais to support and automate part of the clinical diagnosis of electrocardiograms in the health system, which resulted in a paper selected for oral presentation in a Workshop at ICML 2025.
- Research Intern**, Philips – Paris, France Feb 2024 – Aug 2024
- Developed a foundation model for Electrocardiograms (ECGs) using Self-Supervised Learning methods, reducing the need for expensive and time-consuming annotated data.
 - Improved the model used in the company's pipeline by pre-training with unannotated data.
 - Submitted two patent applications relating to the use of the foundation model in automated clinical diagnosis.
- Summer Research Intern**, Sorbonne - Paris, France June 2023 – July 2023
- Computer vision research aimed at tracking a single-celled protozoan and building a network that automatically focuses on the organism using Residual Networks and Vision Transformer encoders.
- Research Intern**, Computational Intelligence Laboratory (UFMG) - BH , Brazil July 2021 – Aug 2022
- Research on Natural Language Processing (NLP) using Deep Learning methods to develop Text-to-Speech, Speech-to-Text and Face Synchronization models.
 - Developed a model capable of synthesis and transcription in Portuguese, which was challenging due to the lack of annotated data.
- Software Engineering Intern**, Infosistemas - BH , Brazil Jan 2021 – July 2021
- Developed, debugged, and optimized the company's API, primarily focusing on the backend, utilizing Node.js and SQL.

Publications

- Learning Navigable World Models via Latent Energy Shaping** 2026
Luiz Facury, Jose Geraldo Fernandes, Pedro Dutenhofner, Wagner Meira Jr.
2nd Workshop on World Models @ ICLR 2026
- Beyond Patient Invariance: Learning Cardiac Dynamics via Action-Conditioned JEPAs** 2026

Jose Geraldo Fernandes, **Luiz Facury**, Pedro Dutenhofner, Wagner Meira Jr.
2nd Workshop on World Models @ ICLR 2026

Transferring Clinical Knowledge into ECGs Representation: A Self-Supervised Approach for Interpretable, Unimodal-at-Inference Diagnosis 2025

Jose Geraldo Fernandes, **Luiz Facury De Souza**, Pedro Dutenhofner, Gisele L. Pappa, Wagner Meira Jr.
TS4H @ Neurips 2025

Bridging the Gap in Clinical AI: Zero-Shot Multimodal ECG Analysis with Textual Explanations 2025

Luiz Facury De Souza, Jose Geraldo Fernandes, Pedro Robles Dutenhofner, Turi Andrade Vasconcelos Rezende, Gisele L. Pappa, Gabriela Miana Paixão, Antonio Luiz Pinho Ribeiro, Wagner Meira Jr.
LXAI @ ICML 2025 - Selected for Oral Presentation

Dense Self-Supervised Learning for Medical Image Segmentation 2024

Maxime Seince, Loïc Le Folgoc, **Luiz Facury De Souza**, Elsa Angelini
Medical Imaging with Deep Learning (MIDL)

Multiple-Input Multiple-Output Randomized Fuzzy Cognitive Map Method for High-Dimensional Time Series Forecasting 2024

Omid Orang, Hugo Vinicius Bitencourt, **Luiz Augusto Facury Souza**, Patrícia Oliveira Lucas, Petrônio CL Silva, Frederico Gadelha Guimarães
IEEE Transactions on Fuzzy Systems

Combining embeddings and fuzzy time series for high-dimensional time series forecasting in internet of energy applications 2023

Hugo Vinicius Bitencourt, **Luiz Augusto Facury Souza**, Matheus Cascalho Santos, Rodrigo Silva, Petrônio CL Silva, Frederico Gadelha Guimarães
Elsevier Energy

An embedding-based non-stationary fuzzy time series method for multiple output high-dimensional multivariate time series forecasting in IoT applications 2023

Hugo Vinicius Bitencourt, Omid Orang, **Luiz Augusto Facury Souza**, Petrônio CL Silva, Frederico Gadelha Guimarães
Springer Neural Computing and Applications

Volunteering

Mathematics Mentor, Eductus – University of São Paulo

May 2020 - Aug 2020

Volunteered in a project aimed at teaching students whose schools were temporarily closed due to the COVID-19 pandemic.

Languages

Portuguese: Native | **English:** Advanced C1 | **French:** Advanced C1