

JOSÉ LUCAS DE MELO COSTA

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EDUCATION

- 2024 - 2027 **PhD Student** - Computer Science
LISN, CentraleSupélec, Paris-Saclay University - Paris, France
Anomaly detection, tabular data, self-supervised learning
- 2021 - 2023 **Master's in Engineering** - Major in artificial intelligence
CentraleSupélec, Paris-Saclay University - Paris, France
- 2018 - 2023 **Bachelor's in Computer Engineering**
University of São Paulo - São Paulo, Brazil

ACADEMIC EXPERIENCE

Research Engineer *June 2024 - Oct. 2024*
Interdisciplinary Laboratory of Numerical Sciences (LISN) - Gif-sur-Yvette, France

- Conducted a comprehensive analysis of **anomaly detection models** by conducting a thorough **literature review** and implementing **state-of-the-art** data modeling techniques.
- Boosted classification and regression scores, implementing **self-supervised techniques** in tabular data

Technical skills: Data modeling, machine learning, data preprocessing

Research intern *April 2023 - Sept. 2023*
French Alternative Energies and Atomic Energy Commission (CEA) - Saclay, France

- Reduced model size by 50% while maintaining accuracy by implementing a novel **quantization** scheme for **Visual Transformers (ViT)**.
- Reduced computational complexity, making Visual Transformers more **embeddable on resource-constrained devices**.
- Presented results on attention-based network compression at the 2024 **HiPEAC workshop** contributing to advancements in model embeddability.

Technical skills: python, C++, attention-based networks, knowledge distillation, model training

Research intern *June 2022 - Sept. 2022*
Université Paris-Cité - Paris, France

- Developed a novel **graph-based method** for embedding **time series**, improving **anomaly detection** accuracy by 22% on medical datasets.
- Identified anomalous behavior in **multivariate medical time series** by creating a **latent space representation** and constructing a graph to isolate **outliers**.
- Leveraged **autoencoders** and **graph theory** to design a novel **anomaly detection method**, reducing model training time.

Technical skills: python, pytorch, autoencoders, optimization, anomaly detection

Research intern *April 2020 - Dec. 2020*
Petrobrás 🌐, **University of São Paulo** - São Paulo, Brazil

- Improved **mooring line failure detection** accuracy by 18% by developing a **machine learning** pipeline that classified offshore station statuses using **signal oscillation frequencies**.
- Reduced detection time through the application of **signal processing techniques** like Wavelets and STFT, optimizing real-time failure detection.
- Successfully presented research on machine learning and signal processing for offshore station monitoring at an **international conference** 🌐, driving further interest in the solution.

Technical skills: python, signal processing (Wavelets, STFT), SVM, LSTM

LANGUAGES

- English (C1 - Cambridge Linguaskill) | French (C1 - TCF) | Portuguese (Native)

AWARDS AND SCHOLARSHIPS

- **First-Place Academic Distinction, B.S. Computer Engineering**, University of São Paulo (2023)
Conferred on the program's top-ranking graduate for outstanding academic performance.
- **AUCANI Academic Merit Scholarship** - University of São Paulo (2022)
Highly competitive, university-wide scholarship awarded for exceptional academic excellence.

TEACHING

Teacher assistant

Sept. 2024 - Dec. 2024

CentraleSupélec, Paris-Saclay University - Paris, France

Assistant in "Introduction to Python Programming" and "Algorithms". **Technical skills:** Python, C, C++

Undergraduate teacher assistant

Feb. 2019 - Dec. 2019

University of São Paulo - São Paulo, Brazil

Assistant in "Algorithms and data structures" and "Systems programming.". **Technical skills:** C, C++

COURSES

- **Deep Learning Summer School** - Université Côte d'Azur, Nice, France (July 2024).
- **EUGLOH "Co-Creating Innovation Week"** - Hamburg, Germany (September 2024).
- **Workshop on Deeptech Entrepreneurship** - Deeptech Tour Paris-Saclay (January 2025).
- **Doctoral Program Orientation** - Official welcome and onboarding (November 2024)

PUBLICATIONS

Conferences:

[1] Thimonier, Hugo*, [Costa, José Lucas De Melo*](#), Popineau Fabrice, Rimmel Arpad, Doan, Bich-Liên. (2025). "**T-JEPA: Augmentation-Free Self-Supervised Learning for Tabular Data**". In *The Thirteenth International Conference on Learning Representations ICLR 2025*. *Joint first authors
<https://openreview.net/forum?id=gx3LMRB15C>

[2] [Costa, José Lucas De Melo](#) et al. "**Spectral Graph-Based Networks for Mooring Line Failure Detection on Fpso.**" *Proceedings of the ASME 2024 43rd International Conference on Ocean, Offshore & Arctic Engineering*, Singapore. June 9–14, 2024. <https://doi.org/10.1115/OMAE2024-136899>

[3] [Costa, José Lucas De Melo](#), Queiroz Filho, AN, Santos, IHF, Barreira, RA, Costa, AHR, Gomi, ES, & Tannuri, EA. "**FPSO Mooring Line Integrity Supervising System Based on Motion Data and Natural Frequency Estimation.**" *Proceedings of the ASME 2021 40th International Conference on Ocean, Offshore and Arctic Engineering*. June 21–30, 2021. <https://doi.org/10.1115/OMAE2021-62991>

Workshops and presentations:

[4] [Costa, José Lucas De Melo](#), Moineau, C., Allenet, T., & Kucher, I "**Centered Kernel Alignment for Efficient Vision Transformer Quantization.**" *Oral presentation at 6th Workshop on Accelerated Machine Learning (AccML)*, co-located with the HiPEAC 2024 Conference, Munich, January 2024. Available at: <https://accml.dcs.gla.ac.uk/papers/2024/6th AccML paper 17.pdf>

[5] [Costa, José Lucas De Melo](#), Poli, J., Nguyen, M.-B., Ducatez, A., Bouscary, M., & Boucher, B. (2022). "**Learning and understanding strategies on zero-sum games.**" *Oral presentation at the Junior Multidisciplinary Congress*, Université Paris-Saclay, 2022. Available at: https://jmcosta.site/static/Congres_Junior-52ed4bd50d50caa4b81d65899e281798.pdf

[6] Costa, José Lucas De Melo, et al. "**Detection of Failures in the Anchoring System of Floating Platforms by Natural Frequency of Oscillation.**" *Presentation at the 28th International Symposium on Scientific and Technological Initiation, University of São Paulo (SIICUSP), 2020.*

Working papers:

[7] Costa, José Lucas De Melo, Popineau Fabrice, Rimmel Arpad, Doan, Bich-Liên. (2025). "**Leveraging Self-Supervised Learning for Fraud Detection in Tabular Data**". *Work in progress.*

[8] Costa, José Lucas De Melo, Popineau Fabrice, Rimmel Arpad, Doan, Bich-Liên. (2025). "**On the Training Dynamics and Loss Landscape of Linear Joint Embedding Predictive Architectures.**". *Work in progress.*