Cauã Magalhães Pereira

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LinkedIn — GitHub

Experience

- **Vision and Learning Lab - University of Alberta** Edmonton, Canada
  Visiting Researcher — Computer Vision *Jan 2026 – Apr 2026*
  - Selected for the University of Alberta Research Experience 2026, a competitive international research program.
  - Conducted research on multimodal semantic segmentation by adapting deep learning models and data pipelines to fuse RGB and thermal (multispectral) imagery.
  - Reviewed the state of the art in domain adaptation and investigated its application to multispectral semantic segmentation.
  - Developed reproducible large-scale training pipelines on the Alliance of Canada's HPC clusters using Slurm for GPU job scheduling and experiment orchestration.

- **VeRLab** Belo Horizonte, Brazil
  Student Researcher — Computer Vision

  Image Matching Research Sep 2025 – Present
  - Contributed to the ideation and experimental design of a novel keypoint descriptor for image matching, currently under review at NeurIPS 2026.
  - Led benchmarking and experiments across five established benchmarks, with the proposed method outperforming strong baselines on the majority while remaining competitive on the rest.
  - Extending this direction with reinforcement learning and reference-conditioning for keypoint detection, and non-rigid synthetic data generation for training data, in parallel with the Multivisão project.

  Petrobras Multivisão 3 (3D Semantic Segmentation) Aug 2025 – Present
  - Adapted state-of-the-art point cloud models for complex real-world industrial environments.
  - Built scalable pipelines for large-scale point cloud partitioning, dataset preparation, and performance optimization.
  - Optimized model architectures to improve segmentation accuracy and robustness under challenging 3D conditions.

  Captar Libras (Sign Recognition) May 2024 – Aug 2025
  - Achieved state-of-the-art performance (under 5% WER) on the recognition component of a multimodal, bidirectional sign language–speech translation system (pairing vision-based recognition with a photorealistic avatar for sign generation) to bridge communication between Deaf patients and healthcare professionals without a human interpreter.
  - Implemented a complete data pipeline, including preprocessing and training acceleration, reducing training time by over 80% and improving model generalization across different users.
  - Expanded and maintained a custom Libras dataset by coordinating volunteers and conducting new video recordings to enrich the data.
  - Designed and optimized deep learning architectures (ViTs, CNNs, RNNs) with targeted data augmentation strategies, improving model robustness and generalization under the project's hardware and dataset constraints.
  - Investigated hardware-software integration by analyzing camera systems, diagnosing issues, and proposing model optimizations for real-world deployment.
  - Mentored a new lab member on video denoising techniques and coordinated the development of an effective solution.

- **IHM Stefanini — LITE** Belo Horizonte, Brazil
  Student Researcher — IoT and Embedded Systems *May 2023 – April 2024*

- **LITE** Belo Horizonte, Brazil
  Electronics Intern — IoT *June 2022 – December 2022*

Publications

- First author on a computer vision dataset paper for sign language recognition. *Under review at NeurIPS 2026 Datasets and Benchmarks Track.*
- Co-author on a computer vision paper in local feature matching. *Under review at NeurIPS 2026.*
- Santos, N. S. et al. (**including C. M. Pereira**). *Captar-Libras: A Bidirectional Translator with a Photorealistic Avatar for Medical Pre-consultation of Deaf Patients. INTERACT 2025*, 2026.

Software Registrations

- Da Cunha, A.B., Reis, M.S., **Pereira, C.M.** et al. 7 modules for the MoBI IoT project (industrial pump monitoring via LoRa, MQTT, and cloud infrastructure). INPI/UFMG, 2024.
- Da Cunha, A.B., Bastos, W.S., **Pereira, C.M.** et al. 7 modules for the SADUMBA project (dam monitoring via ultrasonic and vibrating wire sensors). INPI/UFMG, 2023.
- Da Cunha, A.B., Santos, M.J.C., **Pereira, C.M.** et al. 2 modules for the FIFO2 project (biomedical flowmeter control and visualization). INPI/UFMG, 2023.

Research Interests

- **General:** Computer Vision, Deep Learning, Artificial Intelligence.
- **Specific:** Visual Representation, Image Matching, Multimodal Perception.

Skills

- **Programming Languages:** Python, C++, C.
- **Frameworks/Libraries:** PyTorch, OpenCV, NumPy, Pandas, Matplotlib.
- **Research Tools & Infrastructure:** Docker, Git, SSH, Linux, Jupyter Notebooks, Weights & Biases (W&B).
- **Languages:** Portuguese (native), English (CEFR B2).

Education

- **Bachelor's Degree in Computer Science** *Federal University of Minas Gerais (UFMG)*
  2023 – Present

- **Electronics Technician** *COLTEC - UFMG*
  2020 – 2022
  - Integrated High School and Electronics Technician program at the Technical College of the Federal University of Minas Gerais.