Felipe CADAR

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Summary

I'm a Computer Science PhD student in a joint doctoral program at the Federal University of Minas Gerais (UFMG), Brazil, and Université de Bourgogne, France. Since 2016, I've been a researcher at the Laboratory of Computer Vision and Robotics (VeRLab), where I work on deep learning for image matching, semantic-aware feature description, and large-scale 3D point cloud processing. Curiosity is what pulls me through this work. I love chasing down questions just to understand how things work, and research gives me the space to do that for a living.

Relevant Research Experience

Industrial PhD Researcher, Petrobras / VeRLab Apr. 2025 to Today
Deep Learning on Industrial-Scale 3D Point Clouds

- Industry-funded PhD research on deep learning for ultra-large 3D point cloud scans, running on **SLURM-managed HPC clusters**.

Research Intern, Microsoft Research Jan. 2025 to Mar. 2025
Grounded Question Answering with LLMs

- Built large QA datasets with grounding labels through an LLM-generated annotation pipeline.
- Trained LLMs with token-level grounding so answers trace back to evidence spans in the source.

Research Intern, Google Research Oct. 2022 to Dec. 2022
Encyclopedic Visual Question Answering

- Trained memory-augmented vision-language models as baselines for **Encyclopedic VQA**, a new benchmark for visual questions about detailed properties of fine-grained categories. [code/data]
- Co-author of **ICCV 2023** publication "Encyclopedic VQA".

PhD Researcher, VeRLab (UFMG) Nov. 2021 to Today
Local Feature Correspondence for Deformable and Semantic Matching

- Co-author of **XFeat** (**CVPR 24**), a lightweight accelerated feature extractor now widely used by the community, and first author of **DescriptorReasoning** (**ACCV 24**), which leverages semantic cues from foundation vision models for local feature correspondence.
- Additional author / co-author contributions at **CVIU 22**, **CVPR 23**, and **PRL 23**.

Undergraduate Researcher, VeRLab (UFMG) Apr. 2016 to Nov. 2021
Local Features and Semantic Hyperlapse for First-Person Video

- Co-authored work on geodesic-based descriptors and deformation-aware local features, and contributed to a semantic fast-forward method for first-person videos.
- Co-author at **ICCV 19**, **NeurIPS 21**, **CVPR 18**, and **JVCI 18**. Project pages: descriptors, semantic-hyperlapse.

Awards & Honors

- ICCV grant to attend the conference, France, Aug. 2023.
- CAPES Scholarship for visiting PhD Student in Université de Bourgogne, France, Dec. 2022.
- 18th place of 642 teams in Kaggle competition: Image Matching Challenge 2022, Jun. 2022.

Technical Skills

Languages	:	Python, C++, CUDA, Bash
ML / DL	:	PyTorch, PyTorch Lightning, JAX, HuggingFace, ONNX
3D / CV	:	Open3D, PCL, COLMAP, OpenCV, CloudCompare, CGAL
HPC	:	SLURM, multi-node/multi-GPU training
Tooling	:	Git, Docker, Linux, Weights & Biases

Education

Joint Ph.D., Computer Science, UFMG & Université de Bourgogne Nov. 2021 to Today
Belo Horizonte, Brazil / Dijon, France
Advisors: Erickson R. Nascimento, Renato Martins, Cédric Demonceaux
Research Focus: Semantic-Aware Feature Description, Matching, and Large-Scale 3D Registration

B.Sc., Computer Science, Universidade Federal de Minas Gerais Feb. 2016 to Nov. 2021
Belo Horizonte, Brazil
Advisor: Erickson R. Nascimento

International Computer Vision Summer School (ICVSS) July 2024
Sicily, Italy, Computer Vision in the Age of Large Language Models

Service to the Community

- Reviewer for **CVPR 2023, 2024**, **ICCV 2023**, **ECCV 2024**, **3DV 2024**, and **IROS 2024**.
- Creator of **Paper Hound**, a fast Open Access paper search and filter tool: papers.eucadar.com.
- Workshop organizer at Google's Mind the Gap 2018, "Programming for HoloLens".
- Volunteer mentor helping high school students choose a university major.

Journal Articles

1. **F. Cadar**, Melo, W., Kanagasabapathi, V., Potje, G., Martins, R. & Nascimento, E. Improving the matching of deformable objects by learning to detect keypoints. *Pattern Recognition Letters,* ***PRL 23*** (2023).

2. Potje, G., Martins, R., **F. Cadar** & Nascimento, E. Learning geodesic-aware local features from RGB-D images. *Computer Vision and Image Understanding,* ***CVIU 22*** (2022).

3. Silva, S., **F. Cadar**, Ferreira, R. & Nascimento, E. A 3D modeling methodology based on a concavity-aware geometric test to create 3D textured coarse models from concept art and orthographic projections. *Computers and Graphics,* ***CAG 18*** (2018).

4. Silva, M., Ramos, W., **F. Cadar**, Ferreira, J., Campos, M. & Nascimento, E. Making a long story short: A multi-importance fast-forwarding egocentric videos with the emphasis on relevant objects. *Journal of Visual Communication and Image Representation,* ***JVCI 18*** (2018).

Conference Proceedings

5. **F. Cadar**, Potje, G., Martins, R., Demonceaux, C. & Nascimento, E. R. *Leveraging Semantic Cues from Foundation Vision Models for Enhanced Local Feature Correspondence* in *Asian Conference on Computer Vision,* ***ACCV 24*** (2024).

6. Potje, G., **F. Cadar**, Araujo, A., Martins, R. & Nascimento, E. R. *XFeat: Accelerated Features for Lightweight Image Matching* in *Computer Vision and Pattern Recognition,* ***CVPR 24*** (2024).

7. Mensink, T., Uijlings, J., Castrejon, L., Goel, A., **F. Cadar**, Zhou, H., Sha, F., Araujo, A. & Ferrari, V. *Encyclopedic VQA: Visual questions about detailed properties of fine-grained categories* in *IEEE International Conference on Computer Vision,* ***ICCV 23*** (2023).

8. Potje, G., **F. Cadar**, Araujo, A., Martins, R. & Nascimento, E. R. *Enhancing Deformable Local Features by Jointly Learning to Detect and Describe Keypoints* in *Computer Vision and Pattern Recognition,* ***CVPR 23*** (2023).

9. Potje, G., Martins, R., **F. Cadar** & Nascimento, E. R. *Extracting Deformation-Aware Local Features by Learning to Deform* in *Advances in Neural Information Processing Systems,* ***NeurIPS 21*** (2021).

10. Nascimento, E., Potje, G., Martins, R., **F. Cadar**, Campos, M. & Bajcsy, R. *GEOBIT: A geodesic-based binary descriptor invariant to non-rigid deformations for RGB-D images* in *IEEE International Conference on Computer Vision,* ***ICCV 19*** (2019).

11. Silva, M., Ramos, W., Ferreira, J., **F. Cadar**, Campos, M. & Nascimento, E. *A Weighted Sparse Sampling and Smoothing Frame Transition Approach for Semantic Fast-Forward First-Person Videos* in *Computer Vision and Pattern Recognition,* ***CVPR 18*** (2018).