FAGNER CUNHA

Computer Vision Researcher

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WHO AM I?

I am an AI/ML researcher specialized in computer vision and deep learning, with strong experience turning research into practical solutions. I have hands-on experience with dataset preparation and cleaning, training and customizing deep learning architectures such as Vision Transformers, EfficientNets, and MobileNets, as well as adapting models for real-world and resource-constrained scenarios. Currently, I am a PhD candidate at UFAM, developing computer vision solutions for ecological monitoring challenges under real-world constraints, such as those posed by camera-trap data.

PROFESSIONAL EXPERIENCE

3/2022 – 3/2024
Remote

Collaborating Researcher — **Mila - Quebec Artificial Intelligence Institute**

I was responsible for preparing datasets and training computer vision models for insect identification. During my collaboration, I:

- Built and curated the dataset used for model training, including the publication of The AMI Dataset (Insect Identification in the Wild)
- Trained models to classify insect life stages, distinguish moths from other insect species, and identify moths at multiple taxonomic levels (family, genus, species) under extreme fine-grained and long-tail distribution conditions
- Tackled domain shift challenges in applying models trained on GBIF-indexed images to real-world camera-trap data

`Computer Vision  /  Domain shift  /  Long-tail  /  PyTorch`

3/2022 – 3/2024
Remote

Artificial Intelligence Researcher — **eButterfly**

Led the development of a global deep learning model to automatically identify butterfly species from images submitted by citizen scientists to the eButterfly platform. Key contributions:

- Aggregated a large-scale, diverse dataset covering over 18,000 butterfly species using GBIF-indexed data
- Integrated biological priors, including geographical distribution, to enhance model performance
- Trained and optimized deep learning models for fine-grained classification under a highly imbalanced long-tail distribution

`Computer Vision  /  Fine-grained Classification  /  PyTorch`

4/2017 – 6/2018
Manaus, AM, Brazil

Computer Vision Researcher — **Mamiraua Institute**

I worked as a computer vision researcher on Project Providence, focusing on developing deep learning models for animal species recognition on the camera vision module. My tasks included:

- Analyzing, cleaning, and preparing camera trap image datasets for model training
- Training and evaluating animal species classifiers using deep convolutional neural networks
- Optimizing models to run efficiently on the Providence camera vision module, based on a Raspberry Pi development board

`TensorFlow  /  Computer Vision  /  Raspberry Pi  /  Camera Traps`

EDUCATION

Expected 12/2025 Manaus, AM, Brazil	**Ph.D. Student - Informatics** Advisor: Eulanda Miranda | Co-Advisor: Juan Colonna Research area: Computer Vision	**Federal University of Amazonas**

This research aims to advance the automated analysis of camera-trap images using computer vision and deep learning techniques. It focuses on key ecological monitoring tasks such as filtering empty images, species classification (at image and capture event levels), and individual counting.

04/2019 Manaus, AM, Brazil	**Master's Degree - Informatics** Advisor: Eulanda Miranda | Co-Advisor: Juan Colonna Research area: Computer Vision	**Federal University of Amazonas**

Thesis: Um estudo sobre abordagens para avaliação out-of-sample de modelos de classificação de animais em imagens de armadilhas fotográficas

01/2015 Manaus, AM, Brazil	**Engineer's Degree - Computer Engineering** Embedded Software Engineering, Machine Learning	**Federal University of Amazonas**

PUBLICATIONS

Aditya Jain[*], **Fagner Cunha**[*], Michael Bunsen[*], Juan Sebastián Cañas, Léonard Pasi, David Rolnick, et al. Insect identification in the wild: The AMI dataset. In European Conference on Computer Vision (ECCV), 2024, pp. 55-73.
[*]Equal contribution

Aditya Jain[*], **Fagner Cunha**[*], Michael Bunsen[*], Léonard Pasi, Anna Viklund, Maxim Larrivée & David Rolnick. A machine learning pipeline for automated insect monitoring. In NeurIPS 2023 Workshop on Tackling Climate Change with Machine Learning. arXiv preprint arXiv:2406.13031.
[*]Equal contribution

Fagner Cunha, Eulanda M. dos Santos, & Juan G. Colonna. Bag of tricks for long-tail visual recognition of animal species in camera-trap images. Ecological Informatics, v. 76, p. 102060, 2023.

Fagner Cunha, Eulanda M. dos Santos, Raimundo Barreto, & Juan G. Colonna. Filtering Empty Camera Trap Images in Embedded Systems. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 2021, pp. 2438-2446.

HONORS & AWARDS

06/2021	**1st Place in the iWildCam 2021 Competition** Count the number of animals of each species present in a sequence of images.	**CVPR - FGVR Workshop**
11/2012	**Best Paper Award at the Workshop of Undergraduate Research** Award received for the paper: Detection of Phishing Webpages Using Machine Learning Techniques	**SBSEG**
08/2011	**Professor Abraham Moysés Cohen Award** Best undergraduate research work in Exact Sciences at the XIX Congress of Scientific Initiation for the work: Detection of Phishing Webpages.	**Federal University of Amazonas**

LANGUAGES

Portuguese native
English   professional working proficiency