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Ananthu Aniraj

Linkedin | Website

Experience

Visiting Researcher — **University of Trento** — *Trento, Italy* — **Feb 2025–Present**

- Research on multi-modal interpretability, supervised by Dr. Massimiliano Mancini and Dr. Elisa Ricci.

PhD. Researcher — **Inria** — *Montpellier, France* — **Apr 2023–Present**

- Researching interpretable-by-design computer vision methods to solve fine-grained species classification tasks with 2 accepted first author papers at top AI conferences.
- Oral Presentation at a top computer vision conference, namely ECCV 2024 (top 2.3% of all submissions to the conference).

Computer Vision R&D Engineer — **Lely** — *Maassluis, Netherlands* — **Sep 2020–Mar 2023**

- Developed computer vision algorithms for monitoring cows and robots, leading to one granted European patent and another pending.
- Built 2 large-scale deep learning projects, managing the entire life cycle from concept to model deployment.
- Supervised 4 master's students through research internships and thesis projects.
- Devised a novel multi-camera, multi-object tracking algorithm deployed 24/7 in multiple dairy farms, enabling automated cow health monitoring and improved robot collision avoidance. [Link]
- Implemented a semi-automated data annotation pipeline, reducing labeling noise and boosting model performance by 20%.

Computer Vision R&D Intern — **Lely** — *Maassluis, Netherlands* — **Jan 2020–Aug 2020**

- Proposed an algorithm for instance-level analysis of cows in images, improving accuracy by 2x.
- Created a new dataset and deep learning model achieving state-of-the-art results tested 24/7 on various farms.

Computer Vision R&D Intern — **Corvus Drones** — *Wageningen, Netherlands* — **Sep 2019–Dec 2019**

- Re-wrote the ArUco marker detection algorithm to enable GPU compatibility, doubling its processing speed.

Education

PhD. in Computer Science, *Inria / University of Montpellier, France*. **Apr 2023–Present (Expected Apr 2026)**

- *Research Topic*: Explainable image classification through supervised and unsupervised part detection
- *Supervisors*: Dr. Diego Marcos, Dr. Cassio Fraga Dantas, Dr. Dino Ienco

M.Sc. in Embedded Systems, *University of Twente, Netherlands*. **Sep 2018–Aug 2020**

- *Master Thesis*: Instance Level Cow Body Part Parsing
- *Supervisors*: Dr. Yan Li, Dr. Nicola Strisciuglio, Dr. Luuk Spreeuwers

B.Tech. in Electrical and Electronics Engineering, *University of Kerala, India*. **May 2013–Apr 2017**

- *Honors*: First Class with Distinction

Skills

- **Programming Languages**: Python, MATLAB, C++, C, LaTeX
- **Machine Learning & AI**: Deep Learning, Computer Vision, Image Processing, Neural Networks
- **Data Science:** Data Analysis, Data Visualization
- **Frameworks & Libraries**: PyTorch, TensorFlow, Keras, OpenCV, NumPy, Pandas, SciPy
- **Technologies:** Git
- **Languages**: English, Dutch (A2), Malayalam, French (A2)

Publications

- Aniraj, A., Dantas, C. F., Ienco, D., & Marcos, D. (2024)**.** PDiscoFormer: Relaxing Part Discovery Constraints with Vision Transformers*. Proceedings of the European Conference on Computer Vision (ECCV), 2024, 15143, 256–272.* (**Oral**)
- Aniraj, A., Dantas, C. F., Ienco, D., & Marcos, D. (2023)**.** Masking Strategies for Background Bias Removal in Computer Vision Models. *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV) Workshops, 2023, 4397–4405.*

Patents

- **System for monitoring a calving mammal**, European Patent: EP4291133B1. Patent Active. [Link]
- **Animal husbandry system**, International Patent Application PCT/IB2023/053903. Patent Pending. [Link]

Certifications

- **Deep Learning Specialization,** Online Course - Coursera (deeplearning.ai), January 2020. [Link]
- **Machine Learning,** Online Course - Coursera (Stanford University), August 2019 [Link]

Projects

Multi-camera, multi-object tracking in dairy farms **Sep 2020–Aug 2022**

- *Role*: Led the development of object detection, global mapping, and tracking algorithms, and mentored 4 interns working on various components.
- *Achievements*: Prepared a dataset of 14000+ images, enhancing object detection accuracy to 98% mAP. Ran the tracking system live 24/7 in multiple farms in the Netherlands. [Link]

Semantic Segmentation for self-driving vehicles **Jan 2021–Sep 2021**

- *Role*: Led the development of deep learning models for semantic segmentation, specifically designed for custom farm environments to minimize manual control of self-driving farm vehicles.
- *Achievements*: Improved model performance by 20% through the development of algorithms to reduce labeling noise, ensuring reliable deployment on self-driving robots.

Instance Level Cow Body Part Parsing **Jan 2020–Aug 2020**

- *Role*: Led the development of a novel deep learning method for this task and collaborated with a team working on calving detection in dairy farms resulting in a pending patent.
- *Achievements*: Achieved state-of-the-art results, created a dataset with over 2000 manually annotated images, and deployed the model for continuous operation on dairy farms.