Maëlic NEAU

Computer Vision & Machine Learning Research Scientist

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Location: Umeå, Sweden (EU citizen)

SUMMARY

Computer Vision and Machine Learning researcher with a joint PhD (Flinders University / ENIB) and 5+ years building real-time perception systems using object detection, Vision-Language Models, and autonomous robots. Author of REACT (BMVC 2025 Oral) and SGG-Benchmark, the first open-source framework for real-time Scene Graph Generation. Two-time RoboCup@Home world champion (2022, 2023). Postdoctoral Fellow at Umeå University. Open to Postdoctoral fellow, Research Scientist and ML/CV Engineer roles across Europe.

TECHNICAL SKILLS

Computer Vision & Machine Learning: Object Detection, Image Segmentation, Visual Relationship Detection, World Models, Real-Time Inference, Model Optimization, CNN (YOLO, ResNets), Vision Transformers (ViT, DETR), Knowledge Graphs, Deep Learning

Frameworks & Libraries: Python, PyTorch, TensorFlow, ONNX, HuggingFace Transformers, Ultralytics, OpenCV, NumPy, Pandas, SLURM (HPC)

LLMs, Foundation Models & Vision-Language-Action (VLA) Models: LLM Agents, BERT, DINO, CLIP, SmolVLA, Pi-0, LeRobot (HuggingFace)

Robotics & Infrastructure: ROS1, ROS2, C++, Gazebo, NAOqi (SoftBank Pepper), Toyota HSR, Docker, Git, Linux, Bash, SQL

EXPERIENCE

Postdoctoral Fellow May 2025 – Present
Umeå University, Umeå, Sweden
Project: Hybrid AI — Bridging Automated Reasoning and Machine Learning in Robotics

- Developing hybrid AI framework combining Scene Graph representations with Vision-Language-Action (VLA) models for multi-step robotic manipulation, targeting real-world physical robot deployment.
- Built an assistive robot arm at HuggingFace's inaugural VLA Hackathon (Mistral AI, Paris, April 2025): integrated Pi-0 VLA and Pixtral VLM to automate patient-feeding tasks in hospital settings.
- Supervisor: Assoc. Prof. Zoe Falomir

Research Intern October 2024 – March 2025
National Institute of Informatics (NII), Tokyo, Japan
Project: Open-Vocabulary Visual Relationship Detection with VLMs

- Designed a reference-free evaluation metric for image-relation alignment in Vision-Language Models to enable open-vocabulary Scene Graph Generation; published at ICCV 2025 Workshop (SG2RL).
- Developed a synthetic pre-training pipeline using VLMs to generate labeled training data for novel visual relation categories, reducing annotation cost while improving generalization to unseen relations.
- Supervisor: Prof. Akihiro Sugimoto

Teaching Assistant February – June 2023
Flinders University, Adelaide, Australia
Course: Fundamentals of Computational Intelligence

- Delivered lab sessions on neural networks, optimization algorithms, and AI fundamentals; supported student projects using Python.

Research Intern April – August 2020
ENIB, Plouzané, France

- Implemented SLAM pipeline for autonomous robot navigation using ROS on Pepper robot; team awarded Best Performance at RoboCup@Home Education Challenge 2020.

EDUCATION

PhD in Computer Science (Cotutelle) 2021 – 2025
Flinders University (Adelaide, Australia) / ENIB (Plouzané, France)

- **Thesis:** Real-Time and Efficient Scene Graph Generation for Real-World Applications — Oral Presentation at BMVC 2025.

- Created SGG-Benchmark: first open-source framework for benchmarking and training real-time Scene Graph Generation models (Python, PyTorch).
- Led the technical development of the RoboBreizh team (10 people) to back-to-back RoboCup@Home world championships (2022, 2023); built full embedded perception stack (ROS, YOLO, OpenPose, OpenCV) on Pepper robot.
- Developed RoboNLU: lightweight BERT-based Natural Language Understanding model for robotic command parsing via Joint-Slot Filling.
- Supervisors: Prof. Cédric Buche, Assoc. Prof. Paulo Santos, Assoc. Prof. Anne-Gwenn Bosser, Prof. Karl Sammut

Master of Computer Science 2019 – 2021
Université de Bretagne Occidentale, Brest, France

- Thesis: Object Detection, Segmentation and Robot Grasping with Toyota HSR for RoboCup@Home.
- Exchange student at Umeå University, Sweden (6 months).

SELECTED PUBLICATIONS

- REACT++: Efficient Cross-Attention for Real-Time Scene Graph Generation. *Under Review*, 2025. arXiv:2603.06386
- GraSP-VLA: Graph-based Symbolic Action Representation for Long-Horizon Planning with VLA Policies. *Under Review*, 2025. arXiv:2511.04357
- REACT: Real-time Efficiency and Accuracy Compromise for Tradeoffs in Scene Graph Generation. **Oral.** *BMVC 2025*, Sheffield, UK. Link
- Measuring Image-Relation Alignment: Reference-Free Evaluation of VLMs for Open-Vocabulary Scene Graph Generation. *ICCV Workshop SG2RL*, 2025.
- Mining Informativeness in Scene Graphs. *Pattern Recognition Letters*, 189, 64–70, 2025. DOI
- Fine-Grained is Too Coarse: A Novel Data-Centric Approach for Efficient Scene Graph Generation. *ICCV Workshop SG2RL*, 2023. Link
- RoboNLU: Advancing Command Understanding with a Lightweight BERT-Based Approach for Service Robotics. *RoboCup 2023*, Springer. DOI
- RoboCup@Home SSPL Champion 2023: RoboBreizh, a Fully Embedded Approach. *RoboCup 2023*, Springer. DOI

Full list: maelic.github.io

AWARDS

- **1st Place (×2)**, RoboCup@Home Competition — Social Standard Platform League 2022, 2023
- Higher Degree by Research Leadership & Scholarly Excellence Award, Flinders University 2024
- **3rd Place**, RoboCup@Home Competition — Social Standard Platform League 2021
- Best Performance Award, RoboCup@Home Education Challenge 2020

STUDENT SUPERVISION

- **Nuria Millet** — Research Internship, Umeå University 2025
- **Alistair MacVicar** — Research Internship, Flinders University 2024
- **Sinuo Wang** — Research Internship, University of Adelaide 2023
- **Thomas Ung** — Master Thesis, Université de Bretagne Occidentale 2022

LANGUAGES

French: Native **English:** Fluent **Spanish:** Intermediate **Swedish:** Intermediate