Clément Detry

Machine Learning Engineer

+32 495 12 96 99 | clementdetry@outlook.com | clem2507.github.io | clementdetry | Liège

Summary

AI enthusiast with a BSc in Artificial Intelligence from Maastricht University and an MSc in Machine Learning from Université de Montréal and Mila Research Institute. Recently completed a role as a Computer Vision Engineer at HumanWare Technologies, where I advanced vision algorithms to aid the visually impaired. Passionate about AI for good initiatives, I aim to leverage cutting-edge technology to create positive societal impacts.

Work Experience

HumanWare Technologies *Montréal, CA*

Computer Vision Engineer *May 2023 - Aug. 2024*

- Led the development of a custom object detection system designed for the visually impaired. Managed the project from Python development through model conversion to TensorFlow Lite and implementation on the Android app for a GPS-equipped device called StellarTrek.
- Engineered a lightweight PyTorch model using an innovative few-shot learning approach, optimized for local processing on embedded devices.
- Worked with the software development team to design a robust, user-friendly UI tailored for the visually impaired.

Nomics Care *Liège, BE*

Data Scientist *Sept. 2021 - June 2022*

- Worked on an AI-driven project aimed at assisting doctors by automatically detecting anomalies in patient sleep-related signals.
- Employed machine learning models, including 1-D CNNs and LSTMs, for detecting specific patterns in time series, notably enhancing the performance from an F1 score of 0.7 to 0.98.
- Managed large, non-structured time-series datasets, developing a robust preprocessing pipeline using the MNE-Python library and Pandas for data cleaning and structuring, along with SMOTE for data balancing.
- This optimized diagnostic process now reduces the time required for doctors to analyze each new patient.

Nomics Care *Liège, BE*

Web Developer Intern *June 2021 - Aug. 2021*

- Initiated the migration of a Windows based app used by doctors for sleep signal analysis to a Django web server app, enabling access to patient analysis platforms from any device.
- Developed the backend for user authentication and password management systems, and established an SQL database for storing user data.

Projects

Medical Image Segmentation (link) *Montréal, CA*

Université de Montréal *Jan. 2023 - May 2023*

- Worked within a three-person team on a project aimed at 3D medical image segmentation, utilizing CT and MRI scans. The objective was to assess and refine the architectural framework of a U-Net model to enhance its segmentation performance.
- Implemented a series of strategic modifications to the U-Net model, including adjustments to the convolutional block, improvements in skip connections and the integration of a cross-attention mechanism. At the same time, established a standardized data preprocessing and augmentation pipeline, ensuring consistent and accurate evaluation of architectural changes across model iterations.
- Improved medical image segmentation by adding convolutional layers to shortcut paths, achieving the best overall performance with an average rank of 1.59 across various datasets.

Interactive Human vs Robot "Water Pong" Game (link) *Maastricht, NL*

Maastricht University *Sept. 2021 - Jan. 2022*

- Collaborated in a team of four to create an interactive "Water Pong" game featuring real-time computer vision along with a robotic arm controller. Utilized Hough Circle Transform in OpenCV for precise cup detection and YOLOv5 for ball tracking, enabling accurate distance measurements.
- Engineered an adaptive lookup table for the robotic arm's throw parameters, correlating with cup positions to achieve a target hitting accuracy of 90%.

Education

Université de Montréal & Mila - Quebec AI Institute *Montréal, CA*

MSc in Computer Science (Machine Learning) *Sept. 2022 - Jan. 2024*

- **CGPA:** 3.98/4.3
- **Courses:** Data Science, Machine Learning, Representation Learning (by Prof. Aaron Courville), NLP, Big Data

Maastricht University *Maastricht, NL*

BSc in Data Science and Artificial Intelligence *Sept. 2018 - Jan. 2022*

- **CGPA:** 7.23/10
- **Thesis:** Identifying Patterns in Jaw Activities: Time Series Analysis of Sleep-Related Data (link)
- **Supervisor**: Prof. Rachel Cavill

Skills

Programming	Python (advanced), Java / Kotlin (advanced), SQL (advanced), C++ (intermediate)
Libraries	PyTorch / TensorFlow (advanced), Scikit-learn (advanced), Pandas (advanced), Numpy (advanced), OpenCV (advanced)
Other Tools	Git (advanced), Jupyter (advanced), Matlab (advanced), Docker (intermediate), Django (intermediate)

Languages

French	Native
English	Fluent
Dutch	Intermediate