



Aurelio Losquiño Muñoz

Artificial vision engineer

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EDUCATION

AUTONOMOUS UNIVERSITY OF BARCELONA, SPAIN

Sep. 2016 - Jun. 2020

DEGREE IN MATHEMATICS

Specialization in Fundamental Mathematics

UNIVERSITY OF BARCELONA, SPAIN

Sep. 2020 - Sep. 2021

MASTER'S DEGREE IN ADVANCED MATHEMATICS

Specialization in Computational Algebra

EXPERIENCE

PRIVATE TUTOR FOR UNIVERSITY STUDENTS

2019 - 2021

MATHEMATICS AND PROGRAMMING TUTOR FOR ENGINEERING STUDENTS

- Assisted four engineering students from different universities such as **UPC**, **UB**, and **laSalle**.
- Subjects taught: **C Programming** and **Multivariable Calculus**.

SMALLE TECHNOLOGIES

Apr. 2020 - Sep. 2021

SOFTWARE DEVELOPER TRAINEE

- Developed **web scraping** scripts to obtain datasets about water quality in Catalonia.
- Trained **machine learning models** to predict water quality based on cheaper variables to measure.
- Programmed the backend and a **NodeJS+MySQL REST API** for processing, storing, and delivering sensor data deployed in fish farms.

SMALLE TECHNOLOGIES

Sep. 2021 - Oct. 2023

ARTIFICIAL VISION ENGINEER

- Trained models using a **custom detection dataset** with YOLOv4, MobileNet, **YOLOv7**, and **YOLOv8** architectures.
- Trained **instance segmentation models** using **Mask RCNN** and **YOLOv7-seg** architectures.
- Optimized models in **TensorRT** format with **FP16** precision for **real-time inference**.
- Developed complete pipelines for deploying **artificial vision applications with GStreamer and Deepstream** on **Nvidia Jetson** devices.

- Developed software capable of **counting and estimating the mass of each fish in real-time** at a speed of 800 fish/min.
- Developed software capable of **detecting dead or unhealthy fish** and providing alerts for operators.
- These software solutions were commercialized and implemented in several fish farms, generating substantial revenue for the company.

ALSTOM

Feb. 2024 - Present

COMPUTER VISION ENGINEER

- Developed a Python library used for **3D camera calibration and 3D reconstruction**. This library required a deep knowledge of **linear algebra, projective geometry, and computer vision techniques**.
- Developed a software to retrieve results from a 3D train reconstruction analysis and publish it to client visualization app.

SKILLS

| | |
|------------------------------------|---|
| LANGUAGES | Native: Spanish Catalan Professional: English |
| PROGRAMMING LANGUAGES | Python C JavaScript/NodeJS Java |
| V.A. FRAMEWORKS / LIBRARIES | YOLO models GStreamer Deepstream PyTorch Docker |
| DATA FRAMEWORKS/LIBRARIES | Pandas scikit-learn Matplotlib |
| CLOUD | Google Cloud Google App Engine Heroku AWS |
| SOFT SKILLS | Strong Problem Solving Autonomy Good Communicator Rigor |

PERSONAL PROJECTS

- Implemented the **Minimax algorithm with alpha-beta pruning** in **C language**, optimized with variations of the **iterative deepening** algorithm for the games of **chess, checkers, and connect four**.
- Developed a **Python and Selenium bot** for the website playok.com to **automate moves**. The program easily surpassed the level of an average player. <https://github.com/aurelm95/DAMAS-playok-Bot>
- Created a **Python bot** for the online game <https://www.travian.com/es> with **telegram alerts**, allowing me to progress in the game at a nonhuman rate.
- Implemented a **neural network from scratch** in Python using the **backpropagation algorithm** to train the network to **recognize handwritten digits** (MNIST). <https://NumberRecognition.aurelm.repl.co>
- Implemented the **"NeuroEvolution of Augmenting Topologies" (NEAT) genetic algorithm**. It was used in various **reinforcement learning environments**.
- Developed software to find **sure bets using web scraping** with Python requests from different **betting websites** (bet365, williamhill, bwin...).
- Tracked, stored, and visualized price variations by **daily web scraping from Amazon**.

COLLABORATIONS

- Collaborated with the "Centre de Recerca Matemàtica" (CRM) by mentoring a high school final project on **mathematics and artificial intelligence applied to chess**.

OPEN SOURCE CONTRIBUTIONS

- Contributed to the **state-of-the-art repository** <https://github.com/ultralytics/ultralytics> (YOLOv8) by generating the **Dockerfile** for **Nvidia Jetson** devices.
- Contributed to the repository <https://github.com/aurelm95/yolov7-seg> by **fixing a bug** that prevented proper model export.

OTHER INTERESTS

- Chess, traveling, and sports in general.