# Andrei Moraru

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## Experience

**Bosch** *Machine Learning Engineer* March 2023 – Present

- Mainly contributed to an Object Detection head as part of a feature team for a multi-task perception project.
- I also helped working on parts of the (initially) TensorFlow based training framework, such as data pipeline, training callbacks, evaluation metrics, video pipeline. I developed a great interest for working on the library, such that when the project migrated to PyTorch, I began working on it under a clearly defined role.
- Took side-quests like building azure pipelines, a label converter, a CUDA kernel, a custom K-Means implementation, a Voxel51 representation for our detection dataset, and various little tools for experimental tasks.
- Wrote documentation, tutorials and held some presentations for how to get set up and started with both the development environment and the tools that had I worked on.

**Porsche Engineering** *Working Student* July 2022 – February 2023

- Automated test cases for simulated car components by developing and extending Python scripts.

**Bosch** *Working Student* July 2021 – June 2022

- Worked on data analysis, calibration, and sensor fusion algorithms for inertial measurement sensors in MATLAB.
- Contributed to a research paper (AQTR 2022), gaining experience in academic research.

## Projects

**Venus** *C++* 2025

- Venus is a Deep Learning library that focuses on Compile Time semantics and performance over everything.

**First Person Shooter** *C#* 2024

- A 3D first person shooter game in Unity with OAK-D hand-tracking integration for augmented reality.

**Toy Compiler** *Prolog* 2024

- A compiler (virtual machine) for a toy programming language with Lua-like syntax.

**OAK Detector** *Python* 2023

- Deployed a PyTorch SSD model to a Luxonis camera for online video inference.
- Glued together APIs from ONNX, Intel's OpenVINO, and Luxonis' DepthAI framework.

**Neural Machine Translation** *Python* 2023

- My TensorFlow take on "Attention is All You Need" on the original En-De datasets from the paper.
- I created a TensorBoard integrated pipeline I am still happy with today, made use of youtokentome (byte-pair encoding), sacrebleu (BLEU score evaluation), and EinOps for tensor tricks.

**Super Resolution GAN** *Python* 2023

- A modern TensorFlow adaptation of the CVPR paper using GANs to super-resolve images.
- Compares the GAN implementation to bicubic interpolation on low-res images to the original high-res ones.

**Context Collector** *Python* 2022

- A mixed vision-language model that outputs captions for instances of a video frames, based on the original paper Show, Attend and Tell, with extra video inference.

**2D Object Tracking Simulator** *MATLAB* 2022

- Some linear, extended and unscented movement tracking Kalman filters, with a fun twist.
- This was also my Bachelor's paper, and funnily my most ever used project (going by MathWorks statistics).

View on MathWorks

## Education

**Technical University of Cluj-Napoca**

**Bachelor's degree** in Computer Science and Automation — 2018 – 2022
**Master's degree** in Artificial Intelligence and Computer Vision — 2022 – Present

## Technical Skills

**Programming Languages:** Python · C++ · C# · Java · MATLAB · C · CUDA · JavaScript/TypeScript
**Frameworks:** PyTorch · TensorFlow · Numpy · Numba · AzureML · Pandas/Polars · OpenCV · Scikit-Learn
**Infrastructure and Tools:** Docker · CMake · Bazel · Jenkins · Linux · Git · GitHub Actions