

# Eduard Antonovic Occhipinti

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Double degree Computer Engineering student looking for an internship in the AI&ML field

## Education



**Polytechnic University of Turin | Grenoble INP - Ensimag, UGA**

Italy | France

MASTER IN COMPUTER ENGINEERING WITH A SPECIALIST TRACK IN ARTIFICIAL INTELLIGENCE AND DATA ANALYTICS  
MASTER OF SCIENCE IN INFORMATICS OF GRENoble

2023 - TBD

- **Experience Abroad** Double Degree Program with Grenoble INP - Ensimag, UGA.
- **Other Experiences**

- Participated in a Special project for the Computer Architecture course, the project consisted in studying the various **TinyML** techniques used to optimize **TensorFlow** models with the objective to run inference on a pre-trained model running on an **embedded device** (RISC-V, X-HEEP platform).
- Currently working on a **Fault Injection System for Redundant Systems** written in **Rust** with the System and Device Programming professor.



**University of Turin**

Italy

BACHELORS OF SCIENCE IN COMPUTER SCIENCE | 110 CUM LAUDE

2020 - 2023

- **Experience Abroad** Erasmus exchange at the University of Oslo, Norway. Here I followed an introductory course to the field of Artificial Intelligence and Machine Learning and did my internship at the informatics research lab, in the Formal Methods group.
- **Thesis** Design and Development of the Digital Twin of a Greenhouse

In this thesis I talked about the concept of Digital Twin and its applications, about concepts related to the Semantic Web and introduced a novel programming language called **SMOL**, developed by researchers at the University of Oslo to help interfacing with Digital Twins.

Then I talked about the project that was assigned to me and my colleagues to serve as a proof of concept for the language and build the basis for its usage on a larger scale.

PDF: <https://github.com/eduardz1/Bachelor-Thesis/blob/main/main.pdf>

Related paper presented at **SEAMS 2024**: <https://conf.researchr.org/details/seams-2024/seams-2024-artifact-track/5/GreenhouseDT-An-Exemplar-for-Digital-Twins>

- **Other Experiences**
  - Helped the professor as lab assistant for the course of **Operating Systems**
  - Helped with the organization and the lectures of a course on **Python** for High School students interested in Computer Science

## Certificates

2023 **IELTS Academic 8.0**, British Council

## Publications

Kamburjan, E., Sieve, R., Prabhu Baramashetru, C., Amato, M., Barmina, G., Occhipinti, E., & Broch Johnsen, E. (2024). GreenhouseDT: An Exemplar for Digital Twins. *Proceedings of the 19th International Symposium on Software Engineering for Adaptive and Self-Managing Systems*, 175–181. <https://doi.org/10.1145/3643915.3644108>

## Skills

**Languages** Italian | English | Russian

### Other Languages

- Good experience with **C, Java, Python, Rust, SQL, Javascript, Typescript** and **Typst**
  - Worked a lot with **numpy, tensorflow, scikit-learn, matplotlib, numba, seaborn, scipy**
  - Worked with **Big Data** frameworks, in particular **Apache Spark** and **Hadoop**
  - Worked with **React**
- Good knowledge of **Gradle, Makefile** and **Cargo** build tools, **Git** and **GitHub** workflow
- Intermediate experience with **C++, R, Haskell** and **Agda**
- Some experience with **ARM Assembly, InfluxQL, SPARQL, MQL, NoSQL** databases and **LaTeX**
  - Experience with NoSQL time series databases like **InfluxDB** as part of my bachelor thesis
  - Experience with **MongoDB**

**Driving License** B | AB

## Projects & Associations



**IEEE - HKN Honor Society**  
MEMBER OF THE AREA TUTORING

Turin, Italy

2023 - Present

Member of the association at the Polytechnic University of Turin

## TensorFlow Lite - based TinyML implementation in X-HEEP

*TensorFlow, TinyML, C, Python, RISC-V, X-HEEP, YOLO*

SPECIAL PROJECT FOR THE COURSE OF "COMPUTER ARCHITECTURE" AT THE POLYTECHNIC UNIVERSITY OF TURIN

2024

- [https://github.com/eduardz1/University/blob/main/PolITO/ASE/special\\_project/presentation/sp.pdf](https://github.com/eduardz1/University/blob/main/PolITO/ASE/special_project/presentation/sp.pdf)

The project consists in studying the various TinyML techniques and optimizations useful to run inference on a pre-trained model on an embedded device. In particular I chose an object recognition model similar to YOLO

## SFIAR - Sistema di Fault Injection per Applicazioni Ridondate

*Rust, Procedural Macros, Fault Injection, Redundant Systems*

PROJECT FOR THE "SYSTEM AND DEVICE PROGRAMMING" COURSE AT THE POLYTECHNIC UNIVERSITY OF TURIN

2024

- <https://github.com/ProgrammazioneDiSistema2024-IA-ZZ/Group-21>

The project consists in the implementation of a fault injection system for redundant systems in Rust.

- Redundancy was implemented through variable duplication in an automatic way through the use of Attribute-like procedural macros,
- Injection of faults is done with a parallel thread and is also implemented as a procedural macro so that the user can inject the triplet (identifier, time, bit\_to\_flip) easily.
- An analyzer library was written to benchmark the code

## Fingerprint Spoofing Detection

*Python, Matplotlib, Scikit-learn, scipy, numpy, numba*

PROJECT FOR THE COURSE IN "MACHINE LEARNING AND PATTERN RECOGNITION" AT THE POLYTECHNIC UNIVERSITY OF TURIN

2024

- <https://github.com/eduardz1/MLPR-Project>

The project consists in the study and implementation of different classifiers in the detection of false fingerprints given a dataset of labelled data.

- The project puts a lot of emphasis on the preprocessing of the data, with techniques such as PCA and LDA.
- Classifiers used are
  - The binary gaussian classifier
  - The Gaussian Mixture Model classifier
  - The Logistic Regression classifier
  - The Support Vector Machine classifier
- The project puts a lot of emphasis on the data visualization and the comparison of the different classifiers.

## Meme Game

*Javascript, React, Node.js, Express, SQLite*

WEB APPLICATION PROJECT AT THE POLYTECHNIC UNIVERSITY OF TURIN

2024

- <https://github.com/eduardz1/Meme-Game>

The project consists in implementing a videogame inspired by the board game "What do You Meme?"

- The game is developed as a single page application using React.
- The application interacts with an HTTP API implemented in Node + Express.
- The database is stored in a SQLite file.
- The communication follows the "two servers" pattern, by properly configuring CORS
- User authentication is implemented with Passport.js and session cookies

## Quoridor LandTiger

*C, ARM Assembly, Embedded Systems, LandTiger, Keil*

PROJECT FOR THE "COMPUTER ARCHITECTURE" COURSE AT THE POLYTECHNIC UNIVERSITY OF TURIN

2024

- <https://github.com/eduardz1/quoridor-landtiger>

The project consists in a C implementation of the strategy game "Quoridor" with a simple AI.

- The game is made to run on the LandTiger board
- The repository is structured as a Keil .uvprojx project

## JMail

*Java, Gradle, JavaFX, MVC, JVM, Design Patterns*

PROJECT FOR THE "PROGRAMMING 3" COURSE AT THE UNIVERSITY OF TURIN

2023

- <https://github.com/eduardz1/Jmail>

The project consists in realizing a simple email client in Java with a graphical interface using JavaFX. The project is structured following the MVC pattern and uses Gradle as a build tool.

- The project uses correctly the Observer/Observable pattern.
- The server handles multiple clients at the same time and errors should be logged.
- Client and server parallelize each activity that does not require sequential execution.
- The application is distributed through the use of Java Sockets.

## Simulazione Transazioni

*C, Linux*

PROJECT FOR THE "OPERATING SYSTEMS" COURSE AT THE UNIVERSITY OF TURIN

2022

- <https://github.com/eduardz1/Simulazione-Transazioni>

The project consists in the implementation of a similar-blockchain system, the main process creates a number of user processes and node processes, the user send each other transactions and the nodes verify them and add them to the ledger. The ledger can be viewed as a text file that is generated at the end of the simulation. The project heavily makes use of shared memory in C.