Filippo **Marcatili**

MSc Student · Human-Centered AI @ DTU

Gentofte, Denmark

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Profile

Human-Centered AI student at DTU, specializing in Visual Computing, with a hands-on background spanning embedded systems, computer graphics, and machine learning. Built a complete ML pipeline from scratch for my Bachelor's thesis on 3D touch-signal localization over Gaussian-splatting scenes, and enjoy working across the stack, from low-level C/Rust drivers to Python research code and real-time rendering. Looking for a working-student or graduate position where I can help build systems that let machines perceive and reason about the world more naturally.

Education

DTU (Technical University of Denmark) *Lyngby, Denmark*

MSc in Human-Centered Artificial Intelligence *Sep. 2026 - Present*

- Specialization track: **Visual Computing** (coursework spans computer vision, machine learning, and human-computer interaction).

University of Trento *Trento, Italy*

B.Sc. in Computer, Communications and Electronic Engineering *Sep. 2023 - Jul. 2026*

- **Bachelor's Thesis:** *Direct Regression for Tactile Signals Localization on 3D Gaussian-Splatting Scenes*, full write-up under **Projects** below.
- **Final grade:** 104/110
- **Relevant Coursework:** Advanced Programming (**Rust**, **Git**), Programming 1-2 (**C**, **C++**, **Java**), Signal Processing, Databases (**SQL**), Operating Systems (**bash**, **C**)

NTNU (Norwegian University of Science and Technology) *Trondheim, Norway*

Erasmus+ Study Exchange *Aug. 2025 - Dec. 2025*

- Introduction to Artificial Intelligence (**Python**), Visual Computing Fundamentals (**Rust**, **OpenGL**), Embedded Systems for IoT (**C**)

Projects

Touch Localization on Gaussian-Splatting Scenes *Individual Project*

Bachelor's Thesis *Code*

- Reframed 3D touch-signal localization over Gaussian-splatting scenes as a direct regression problem, extending the *Splattouch* approach.
- Built the entire **Python, ML pipeline** from scratch: data generation, model training, and evaluation.

Encoding of Facial Tiredness *Group Project*

Cognitive Modelling, DTU *Code*

- Built a linear encoding model of perceived facial tiredness in **Python** (NumPy, scikit-learn): eigenface **PCA**, cross-validated regression, and model inversion to generate synthetic faces at any target rating.
- Designed and ran three perception experiments (face rating, synthetic-face validation, adaptation after-effect); ratings of the generated faces matched the model's predictions with Spearman $\rho = 0.81$–0.90.
- Doubled out-of-sample R^2 (0.18 → 0.36) by removing lighting confounds (per-image normalization, mirror averaging) and switching to ridge regression, validated with **nested cross-validation**.

Trento Live Activity *Group Project*

Civic-Tech Project *Code*

- Built the backend for a civic-tech platform using **Node.js**, **Express**, **PostgreSQL**, and **Firebase**.
- Resolved cross-platform tooling and module-system (ESM/CJS) dependency conflicts to keep the build stable across environments.

Drone Network *Group Project*

Advanced Programming *Code*

- Designed and implemented an interactive **TUI** for real-time monitoring and control of a drone network simulation.
- Developed a robust packet-based communication protocol with source routing, fragmentation/reassembly, and error handling, applying **Rust** concurrency features for asynchronous communication.

Graphic Rendering *Course Project*

Computer Graphics

- Developed a 3D interactive simulation in **Rust** and **OpenGL** with basic lighting and geometry rendering, and a small game environment demonstrating real-time object movement and visual effects.

Pong Machine

Group Project

EMBEDDED SYSTEMS

Code

- Built a complete embedded “Pong” game system (ATmega + external SRAM/ADC, LCD/joystick I/O board, motors/servo and IR sensors), from hardware integration to firmware, implementing low-level **C** drivers and a communication/control stack (**SPI**, **CAN**, **UART**, PID control).

Experience

Turing Council

Lyngby, Denmark

PROJECT LEAD, REBRANDING

Sep. 2026 - Present

- *Turing Council is the student council of DTU Compute, the Department of Applied Mathematics and Computer Science.*
- Leading the council’s rebranding: designing the new logo, followed by new merch and graphics.

Konia s.r.l.

Monte Urano, Italy

PLC PROGRAMMER INTERN

May. 2022 - Jun. 2022
Feb. 2023 - Mar. 2023

- *Konia is a small Italian machine-building company producing conveyor and packaging automation.*
- Developed PLC control logic for an automated conveyor-belt demo system using **Siemens TIA Portal** (**LAD**, **SCL**).
- Integrated IoT connectivity and built a web-based monitoring/control interface using **Node-RED** and **JavaScript**, enabling access from desktop and smartphone.
- Configured PLC-to-HMI/SCADA communication and validated system behavior through functional testing and iterative debugging.

Italmetal Sp.z o.o.

Wrocław, Poland

IT & MAINTENANCE ASSISTANT (ERASMUS+ TRAINEE)

Jun. 2022

- *Selected for the Erasmus+ Trainee for Industry 4.0 Plus programme; worked full-time in the Maintenance and R&D department of an industrial manufacturing plant.*
- Digitized and reorganized maintenance manuals and technical documentation for factory equipment, improving accessibility and traceability for technicians.
- Assisted with industrial maintenance tasks (press control cabinets, PLC/electrical components) and supported machine energy-consumption monitoring to identify efficiency improvements.

Skills

Programming & Technologies	Rust, C, C++, Python, Java, JavaScript, OpenGL, Embedded Systems, Signal & Image Processing, Machine/Deep Learning
Software & Tools	Git, Node.js/Express, Microsoft Suite, PostgreSQL, Firebase, Blender3D, Fusion 360, Adobe Creative Suite, Affinity Suite
Languages	Italian (native), English (C1), Spanish (conversational), Portuguese (basic)

Interests

Music, I play trombone, guitar, and drums and generally enjoy learning at least the basics of anything that catches my interest. Outside of that, I like helping family and friends untangle their tech problems. I’m also passionate about tech and using it to make daily life tasks faster, easier and more automatic.