

# Pascal Fina

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## PROFILE

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I am an Austrian Master's student at ETH Zurich in Electrical Engineering and Information Technology, interested mainly in embedded systems, digital design, and building things close to the hardware. Alongside almost three years of experience at Infineon, I also spend a lot of time on personal projects in my home lab, where I work on microcontrollers, low-power setups and self-hosted systems.

## EDUCATION

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| <b>ETH Zurich</b><br><i>M.Sc. in Electrical Engineering and Information Technology</i><br>• Focus areas: embedded systems, digital design, and hardware-near intelligent systems. | Sep. 2025 – Present<br><i>Zurich, Switzerland</i>  |
| <b>Graz University of Technology</b><br><i>B.Sc. in Information and Computer Engineering</i><br>• Recipient of the TU Graz merit scholarship for academic years 2022–2024.        | Sep. 2021 – Jul. 2024<br><i>Graz, Austria</i>      |
| <b>Seoul National University</b><br><i>Exchange semester in Electrical and Computer Engineering</i>   | Sep. 2024 – Jan. 2025<br><i>Seoul, South Korea</i> |

## EXPERIENCE

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| <b>R&amp;D Intern @ Infineon Technologies</b><br>• Conducted power and performance measurements for our hybrid Time-of-Flight (hToF) sensors<br>• Worked on the development and verification of a processing chip/hardware accelerator for the hToF sensor<br>• Developed a SLAM optimization workflow using Google Cartographer focusing on our specific sensor setup<br>• Built a parameter optimization framework combining Sobol initialization, Bayesian optimization (GPEI), and robust map alignment for geometric error evaluation.<br>• Reduced SLAM mapping error by up to 55% compared to manual tuning and contributed to a paper submitted to IEEE ICRA 2026. | Feb. 2025 – Oct. 2025 |
| <b>Working Student @ Infineon Technologies</b><br>• Worked on verification and testing for automotive sensor chip designs using Verilog and Cadence, and carried out power and performance measurements for hToF sensing systems.<br>• Built a TurtleBot-based robotic setup and integrated hybrid Time-of-Flight sensors into an Ubuntu/ROS platform as part of my Bachelor's thesis at Infineon on evaluating indirect ToF sensors for SLAM.<br>• Worked with C++, Python, ROS, and SystemVerilog/Verilog, Cadence   | Jul. 2022 – Sep. 2024 |
| <b>TA @ Institute of Information Security, TU Graz</b><br>• Organize Q&A sessions, assess assignments, and conduct student interviews for the course <i>Digital System Design</i> .<br>• Support students in SystemVerilog, C, and digital hardware design fundamentals.   | Mar. 2025 – Jul. 2025 |

## PROJECTS

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| <b>SoC Crypto Accelerator for PHOTON-Beetle</b><br><i>SystemVerilog, C, Cocotb</i><br>• Co-designed a hardware accelerator for the <u>PHOTON-Beetle</u> (NIST) cryptographic algorithm and integrated it into a System-on-Chip environment.<br>• Worked on bus-connected peripheral design, memory-mapped software control, register interfacing, and hardware-software integration in Verilog/SystemVerilog and C.<br>• Verified functionality with simulation and Cocotb-based testbenches across the digital design flow.   | <i>Digital Design Project</i> |
| <b>Home Lab and Sensor Prototyping Platform</b><br><i>ESP32, Docker, Python, C</i><br>• Built an automated plant-watering system with ESP32-based sensing and control, combining environmental sensor data, remote actuation, and monitoring workflows.<br>• Self-host and operate a private streaming service, personal cloud, and Home Assistant setup to manage data, monitor devices, and control the watering system remotely.<br>• Currently extending my home lab with a custom router for the server and network setup | <i>Personal Project</i>       |

## SLAM with Indirect Time-of-Flight Cameras

*Bachelor's Thesis*

*C++, Python, ROS, Cartographer*

- Investigated the use of indirect Time-of-Flight cameras for simultaneous localization and mapping on a robotic platform.
- Integrated sensor data into Cartographer, built evaluation pipelines, and analyzed map quality under different configurations and environments.
- Implemented tooling in C++ and Python for data processing, alignment, and quantitative comparison of generated maps.

## PUBLICATIONS & THESIS

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### **Sensor-Specific Parameter Optimization for Google Cartographer**

*Submitted to IEEE ICRA 2026*

*Research output*

- Co-authored research on sensor-specific SLAM parameter tuning and evaluation workflows for Time-of-Flight based mapping systems.

### **Simultaneous Localization and Mapping with Indirect Time-of-Flight Cameras**

*Bachelor's thesis*

- Bachelor's thesis on integrating and evaluating indirect Time-of-Flight sensors for SLAM on a robotic platform.

## TECHNICAL SKILLS

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**Programming:** C, C++, Python, SystemVerilog

**Embedded / Digital Design:** RTL design, FPGA and SoC design, memory-mapped peripherals, hardware-software integration, electronic prototyping/PCB design

**Platforms / Systems:** Linux, Raspberry Pi, ESP32, OpenCR, TurtleBot, Docker

**Tools:** Git, CMake, MATLAB, LaTeX, Cocotb, ROS, 3D printing

**Languages:** German (C2), English (C1), French (B1)

## ADDITIONAL EXPERIENCE

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### **Paramedic @ Austrian Red Cross**

Oct. 2020 – Jul. 2021

- Served at COVID-19 testing stations after completing mandatory civil service.

### **Software Development Intern @ State of Styria**

Jul. 2020 – Aug. 2020

- Provided software and technical support for environmental pollutant monitoring workflows using Python.

### **Intern @ University of Graz, Analytical Chemistry Laboratory**

Jul. 2019 – Aug. 2019

- Analyzed heavy-metal content in urban plant samples and supported laboratory measurements and data handling.