# Helena Cruz

## About me


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helenacruz
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## Programming Languages

C, C++, Java, Python

## Tools and Technologies

Vim, Git, IntelliJ, Visual Studio, Xilinx SDK, Arduino, Linux

## Languages

native
Portuguese
fluent
English
beginner
Spanish

## Education

2016–2018 **MSc. Information Systems and Computer Engineering** — Instituto Superior Técnico, University of Lisbon

Coursework: Applications for Embedded Systems; Networked Embedded Systems; Ambient Intelligence; Software Security; Parallel and Distributed Computation; Robotics; Programming Languages.

2013–2016 **BSc. Information Systems and Computer Engineering** — Instituto Superior Técnico, University of Lisbon

Coursework: Operating Systems; Software Engineering; Databases; Algorithms; Compilers; Data Structures; Computer Architecture; Distributed Systems; Artificial Intelligence; Object-Oriented Programming.

2010–2013 **High School Science and Technologies** — Escola Secundária de S. Lourenço

## Master Thesis

During my master's, I've developed an on-board multi-core and fault-tolerant embedded architecture for Synthetic-Aperture Radar (SAR) image generation systems. The architecture was developed considering the space environment, which can cause bit-flips due to the radiation.

The developed architecture implemented two fault tolerance mechanisms: lockstep and reduced-precision redundancy and aims to protect the Backprojection algorithm from transient faults, using a software-only approach, generating acceptable SAR images in a space environment. The solution was implemented using a SoC, a Zybo board from Digilent, with a Zynq device, containing a dual-core ARM Cortex-A9 processor and a Xilinx FPGA. The architecture was developed in C and the Xilinx SDK was used.

## Selected Projects

**Compiler** — github.com/helenacruz/zu-compiler
Implementation of a compiler for a simple language called Zu in C++, using Yacc and Lex.

**MBED nodes with CAN** — github.com/helenacruz/Interconnecting-mbed-nodes-CAN
Implementation of a CAN (Controller Area Network) using MBED nodes, the FreeRTOS operating system and several additional sensors such as flame, ultrassonic and temperature sensor.

**Parallel 3D Game of Life** — github.com/helenacruz/game-of-life3d
Implementation of a parallel 3D Game of Life in C++ using OpenMP and MPI.

## Interests

My main interests include embedded systems, critical systems, fault tolerance and low-level programming. I also like to play around with boards and sensors.

When I'm not at a computer, I'm probably reading a book, watching a TV show or annoying my cat.