

Bachelor's Thesis

Implementation of a Pedestrian Detection Algorithm for a Fail-Operational Demonstrator System

Enabled by ever decreasing structure sizes, modern System on Chips (SoC) integrate a large amount of different processing elements, making them Multi-Processor System on Chips (MPSoC). If these MPSoCs are used in safety-critical environments it is crucial to ensure that the critical tasks executed on these systems are fail-operational, meaning that they continue to provide a certain level of safety even in cast of a failure in the system.

To demonstrate such a fail-operational system an application is needed to act as critical task. A typical safety-critical task from the automotive domain is a pedestrian detection, especially when considering autonomous driving.

Goal

The goal of this work is to implement a pedestrian detection algorithm in software that runs on the soft-cores of an MPSoC demonstrator system on an FPGA and to integrate the software in the existing demonstrator environment.

Prerequisites

To successfully complete this project, you should already have the following skills and experiences:

- Very good programming skills in C
- Experience in embedded programming
- At least basic Python programming skills
- Self-motivated and structured work style

Learning Objectives

By completing this project, you will be able to:

- Understand the concepts of a pedestrian detection algorithm
- Understand the basic architecture of an MPSoC
- Design and implement embedded software
- Document your work in form of a scientific report and a presentation

Contact

Max Koenen
Room N2118
Tel. 089 289 23084
max.koenen@tum.de

Advisors

Max Koenen