

Open Thesis / Project:

FPGA Acceleration for RTOS

Motivation & Summary

Real-time operating systems often use complex software algorithms in their application software components, but also within the operating system. Such algorithms arise the problem that they need severe computing time and power.

This proposed work aims at having FPGA-accelerated application software code with an automated extraction of algorithms from C code. The main goal is to set up and use a toolchain, enabling an application software developer to mark and automatically extract parts of the application to a FPGA (e.g., as processor extension or operation).

Used System Structure

- RISC-V-based soft core microcontroller
- MCSmartOS

Thesis Type

- Master's Thesis
- Master's Project

Student Target Groups

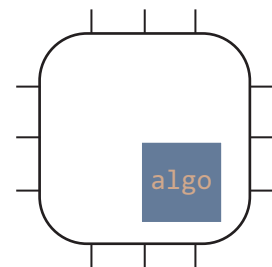
- Information and Computer Engineering (ICE)
- Electrical Engineering (EE)
- Computer Science (CS)

Recommended Prior Knowledge

- C/C++
- Hardware description languages (e.g., Verilog)
- Real-time operating systems

```
OS_TASKENTRY(task1){
    [...]
    while(1) {
        [...]
        #pragma accelerate start
        [ some complex algorithm]
        #pragma accelerate end
        [...]
    }
}
```

```
OS_TASKENTRY(task1){
    [...]
    while(1) {
        [...]
        asm ("algo ");
        [...]
    }
}
```



Contact & Information

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