BA:
Design and implementation of a heating controller for an FPGA evaluation board

Physical unclonable functions (PUFs) utilize inherent manufacturing variations to derive device dependent secrets for key storage or device authentication. To properly test their performance, a custom testing and evaluation board based on Xilinx Artix-7 FPGAs has been developed at the chair. The board features among others the ability to manipulate the temperature of the devices under test (DUTs) by means of a Peltier element. Software on the Cortex-M4 coprocessor of the experiment control module of the board shall regulate the DUTs’ temperature by reading several temperature sensors on the DUTs and the Peltier elements and appropriately adjusting power to the Peltier element.

In this Bachelor’s Thesis, appropriate control software to regulate the DUTs’ temperature shall be designed and implemented. It may be written bare-metal or based on FreeRTOS.

Prerequisites:

- Basic skills in applied control theory
- Good embedded programming skills in C or C++
- Optional: Experience with setting up FreeRTOS

Please apply to:

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References