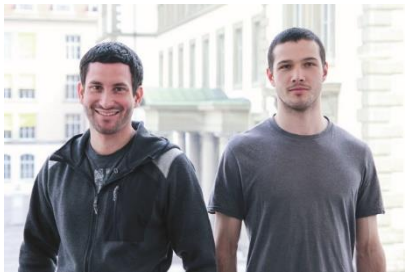
Zurich University
of Applied Sciences

School of
Engineering

InES Institute of
Embedded Systems

Cooperative Embedded Systems

To build a radiator control if the temperature sensor and the controlled radiator are in different rooms, components for transmission of measurement data and for managing the rules are required. Embedded systems are suited very well for this purpose since they have low energy consumption, compact dimensions and a small unit price. The hardware for such a system was developed by the industrial partner Stettbacher Signal Processing AG under the name of Webnode. A Webnode is a microcomputer system built on top of the ARM Cortex-M3 platform. It features an Ethernet port with power over Ethernet for power supply, multiple on-board sensors and actors as well as ports for digital and analogue sensors. In the present bachelor thesis a concept for entering rules is presented and a firmware implementing this concept is developed. Based on previous work, a prototype will be engineered which demonstrates the feasibility of having a modern web framework and the firmware code saved on the 256 kB flash memory of the ARM Cortex-M3. The developed system for managing the rules, reading sensor values as well as controlling actors on a Webnode all work reliably. An open point is the exchange of sensor values between multiple Webnodes over the network.



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A view on the hardware which was designed by the industrial partner. It features an ARM Cortex-M3 CPU with 72 MHz, 64 kB SRAM and 256 kB Flash memory.

The developed web front-end displays the state of the switched outputs and the values of the connected sensors. The device settings can also be managed with the front-end.