

Design of an Interactive Web-System for Gaining and Presenting Expert Knowledge in the Area of Embedded Systems

Motivation

Embedded Systems are based on a multitude of different hardware platforms. This ranges from classical microcontrollers (MCU) and digital signal processors (DSPs), programmable logic (CPLDs/FPGAs) to so-called embedded PCs. Furthermore, combinations of different platforms (e.g. MCU + FPGA) or multiple identical platforms concerning the architecture are possible.

Even within a category, there are multiple decisions to be made. This concerns the size (8bit..32bit, memory, number of logic cells), the type (instruction set, memory type etc.) and the speed with which the platform is supposed to be clocked. In addition to that, an operation system may be of use within some applications.

There are a large number of non-functional requirements specifically in embedded systems alongside functional requirements. These contain among other things, features such as reliability, modifiability, scalability, energy consumption, costs and overall size. Many of these characteristics however refer to the combination of hardware and software.

The decision in favor of the one or the other hardware platform is usually made by experts. The goal of the thesis is to search for approaches that gather, elaborate and provide such expert knowledge for a less experienced developer systematically. This aim is supposed to be carried out via a web-system with a subjacent data base. At present, we are developing a basic approach to this system (see SHPS). In your thesis, you will develop an enhanced approach which considers user feedback in a simple way (e.g. agree/disagree-buttons with automatic evaluation). The inclusion of comparing examples (by users) would also be of use (e.g. comparison of MCU - DSP - FPGA performance via a simple image detection algorithm). Furthermore, the evaluation of these examples must be possible (was this example useful yes/no etc.) and so on.

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