TU Clausthal

Bachelor-, Master- und Doktorandenseminar
des Instituts für Informatik

Higher ISO layers of the CarRing II project with emphasis on layer 3 and the transparent mode

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CarRing-II was created to replace slow field bus technologies such as CAN, LIN, Flexray and MOST by a homogenous, time-deterministic, high-speed and low-latency computer network. The project is founded by DFG and comprises a set of protocols on ISO layers 1-7, together with physical communication nodes in hardware. Applications are seen in real-time communication for vehicles and for process and factory automation. The most remarkable fact is that all protocols are not executed by a processor but synthesized for an FPGA which means that a protocol engine was designed in hardware to achieve superior performance.

In my presentation, a short overview is given on the CarRing-II project with emphasis on my work. This was, so far, the FPGA design of the routing functionality of layer 3 and the so-called „Transparent Mode". Additionally, I will report about the standard interfaces I have implemented in SystemC and VHDL. These interfaces are CAN, RS232, I^{2}C and Ethernet. Transparent mode means that CarRing II serves as a high-speed, low latency backbone for peripheral devices of the aforementioned interface types. One benefit of this concept is a substantial reduction of cables for the field busses which were normally needed to connect such devices, and hence a weight reduction as an important improvement for vehicles.

At the end of the presentation, a practical demonstration is given by means of an IP camera, a YouTube live video stream, CAN- and RS 232-controlled motors and the front lights of a Golf Vcar. Their data streams are transferred simultaneously in real time between two rings of CarRing II without interference.

Dienstag, den 21.01.2014
14 Uhr s.t. in Raum 207, IfI, Arnold-Sommerfeld-Str. 1