Report from industry visits at CC-Systems in Alfta

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Introduction
CC-Systems supplies control systems and computers for industrial applications with
the main focus on onboard computers for heavy vehicles. During 2005 and 2006 I
have made regular visits to CC-Systems in Alfta. The purpose of the visits has been to
discuss the possibilities of using FPGA-technology in the CC-pilot vehicle computers
and display units, and to present results related to this work.

The Project
The CC-pilot is a line of onboard computers for industrial vehicles and other rough
environments. With a wide range of deployment platforms ranging from transport
vehicles to forestry machines and military vehicles, the CC-Pilot computers are
required to provide many different communication interfaces and other connection
possibilities for external devices. In addition to the interfaces found on normal
personal computers the CC-Pilot provide CAN-bus interfaces and analog video
inputs.

The work conducted with CC-Systems has focused on using FPGA-technology to
implement some of the communication and peripheral devices used in the CC-Pilot
systems. During 2006 the work has mainly focused on the design of an FPGA based
pre-processor and display controller for real-time video. The purpose of the video pre-
processor is to allow display of multiple real-time video sources together with
information provided by the CPU.

The work started with a design space exploration of the pre-processor, where the
memory requirements for different implementation alternatives were investigated [1].
Recently the project has resulted in a video pre-processor implementation with limited
support for scaling of the output video frame[2]. Future plans for the project involves
design and implementation of a FPGA-based video enabled display unit for
applications with relatively low computational requirements.

References

[1] N. Lepistö, B, Thörnberg, M. O’Nils “Design Exploration of a Video Pre-
Processor for an FPGA Based SoC”, Workshop on Applied Reconfigurable
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