SORS: Database Analytics with High Level Synthesis on FPGAs

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Abstract: Today, large scale data analytics has become essential for business and society. As of 2012, about 2.5 exabytes of data are created each day, and that number is doubling approximately every 40 months. In order to access, synthesize and interpret this data continuously, efficient execution of Database Management System (DBMS) engines has become an important area of research. In this seminar, we explore how to accelerate data processing operations on top of field-programmable gate arrays (FPGAs) using High-Level Synthesis (HLS) tools. Due to their programmable nature, FPGAs are very versatile. High level synthesis tools enable high level descriptions in C to be directly targeted into FPGA hardware. We demonstrate that full TPC-H benchmark queries can be executed using our engine, which can provide high performance and low power consumption on Xilinx Virtex-7 FPGAs.

Bio: Gorker Alp Malazgirt has MSc EE specialing in system on chip design from Lund University, Sweden. He worked at Ericsson and ST-Ericsson between 2007-2010 as development engineer. He is currently a PhD candidate in computer engineering at Bogazici University, Istanbul. His research interests are computer architectures, reconfigurable computing and metaheuristics.

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