

<u>Name</u>	<u>Organisation</u>	<u>Project title</u>	<u>Decision No.</u>	<u>Decision date</u>	<u>Funding period</u>	<u>Funding</u>
Forsell, Martti	VTT	Implementation study for PRAM-like on-chip architecture	128733	15.09.2008	01.01.2009 - 31.12.2011	126 000

**Project description**

The current system on chip design methodologies do not support efficient design of hardware and software of future embedded systems utilizing highly parallel processing on chip. We believe that key issue needed is providing a parallel architecture that supports abstraction of the underlying computing model for a programmer so that he can exploit the existing well-established theory of parallel algorithms. Such an efficient implementation of general purpose parallel computing would make it possible to use software based design methodology providing better flexibility and faster time-to-market than current hardware based. The only model that fulfills these requirements is the parallel random access machine (PRAM) providing a view of unified shared memory and concept of synchronous execution at machine instruction level. The aim of this project is to study implementation of a PRAM-like multiprocessor system on chip (MP-SOC) architecture based on the Eclipse MP-SOC framework (developed in past ADNOC and on-going EMCA projects) and to design a 64-processor FPGA prototype for it. Theoretical emphasis will be in evaluation of fundamental architectural choices between moving data and moving threads approaches and practical emphasis will be in development of a physically feasible FPGA prototype. Funding from the Academy of Finland is applied to keep Finnish computer science/engineering research community competitive in the rush towards PRAM realization.