Seminar Announcement

Wednesday 12 April 2017, Time:11.30-14.30
AULA NETTUNO-SOFTEL, Floor I, Ed. 3/A DIETI - Via Claudio, 21 NAPOLI

Prof. Veljko Milutinovic

Life Member of the ACM
Fellow Member of the IEEE
Member of Academia Europaea
Member of the Serbian Academy of Engineering
Member of the Advisory Board of the Vienna Congress COMSULT
Member of the Scientific Advisory Board of Maxeler Technologies

DataFlow SuperComputing for BigData

This presentation analyses the essence of DataFlow SuperComputing, defines its advantages and sheds light on the related programming model. DataFlow computers, compared to ControlFlow computers, offer speedups of 20 to 200 (even 2000 for some applications), power reductions of about 20, and size reductions of also about 20. However, the programming paradigm is different, and has to be mastered. The talk explains the paradigm, using Maxeler as an example, and sheds light on the ongoing research in the field. Examples include: Cultural Heritage enhancement, Cryptography and Security, Trading and Finances, Credit Derivatives and numerous related Banking Applications, Signal Processing, Geo Physics, Weather Forecast, Oil Gas, Data Engineering, Data Mining, Smart Grid, Scientific Simulations, Brain Research, Genomics, etc. Also, a recent study from Tsinghua University in China is presented, which reveals that, for Shallow Water Weather Forecast (a BigData problem), on the 1U level, the Maxeler DataFlow machine is 14 times faster than the Tianhe machine, rated #1 on the Top 500 list (based on Linpack, which is a smalldata benchmark). Given enough time, the talk also gives a tutorial about the programming in space, which is the programming paradigm used for the Maxeler dataflow machines (established in 2014 by Stanford, Imperial, Tsinghua, and the University of Tokyo). The talk concludes with selected examples and a tool overview (appgallery.maxeler.com and webIDE.maxeler.com). A detailed tutorial on programming in space will be available after the talk. Related hands-on activities will be performed by remote login (maxeler.mi.sanu.ac.rs). Since December 2016, Maxeler is also available via Amazon AWS. In December 2016, Hitachi of Japan announced its partnership with Maxeler (also available via Amazon AWS), stating that, for their finance and cryptography applications, Maxeler is orders of magnitude faster than any other ControlFlow platform (i.e., CPU or GPU).

CV: Veljko Milutinovic (1951) received his PhD from the University of Belgrade, spent about a decade on various faculty positions in the USA (mostly at Purdue University), and was a co-designer of the DARPAs first GaAs RISC microprocessor. Later, for almost 3 decades, he taught and conducted research at the University of Belgrade, in EE, BA, MATH, and PHYS/CHEM. Now he serves as the Chairman of the Board for the Maxeler operation in Belgrade, Serbia. His research is mostly in datamining algorithms and dataflow computing, with the emphasis on mapping of data analytics algorithms onto fast energy efficient architectures. For 7 of his books, forewords were written by 7 different Nobel Laureates with whom he cooperated on his past industry sponsored projects. He has over 40 IEEE journal papers, over 40 papers in other SCI journals (4 in ACM journals), over 400 Thomson-Reuters citations, and about 4000 Google Scholar citations. Short courses on the subject he delivered so far in a number of universities worldwide: MIT, Harvard, Boston, NEU, Columbia, NYU, Princeton, Temple, Purdue, IU, UIUC, Michigan, EPFL, ETH, Karlsruhe, Heidelberg, etc. Also at the World Bank in Washington DC, BNL, IBM TJ Watson, Yahoo, etc.

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