USF UNIVERSITY OF SOUTH FLORIDA COLLEGE OF ENGINEERING

Department of Computer Science and Engineering

IEEE CS Student Chapter Presents

High Performance Green Multicore Computing

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Seminar Abstract:

Multicores have been attracting much attention to improve processing performance and reduce power consumption of computing systems for various application including self-driving automobile, smart home, IoT, deep learning, cancer treatment, image processing, various scientific application including natural disaster simulation, Square Kilometre Array radio telescope and so on. It allows us to reduce power using lower frequency processor cores and increase performance by integrating more cores on a chip including accelerator cores since the power is proportional to the cubes of frequency. To obtain high performance and low power on multicores, co-design of hardware and software, especially parallelizing and power reducing compiler, is very important. This talk introduces importance of a parallelizing and power reducing compiler with its performance and power reduction using DVFS and Clock and Power Gating on various multicores from Intel, IBM, arm, Fujitsu, Tilera, and Renesas for various applications including multimedia, automobile fuel efficient engine control, heavy particle cancer treatment, and earthquake simulation. It also explains importance of hardware and software co-design for next generation high performance Green multicore computing with a memory friendly accelerator that also allows us software short development period and low development cost.

Personal Bio:

Hironori Kasahara is the 2018 IEEE Computer Society President and a professor in the Department of Computer Science and Engineering at Waseda University. He is an IEEE Fellow, an IPSJ Fellow, a Golden Core Member of the IEEE Computer Society, a member of the Engineering Academy of Japan and the Science Council of Japan. He received his PhD in 1985 from Waseda University, Tokyo, joined its faculty in 1986, and has been a professor of computer science since 1997 and a director of the Advanced Multicore Research Institute since 2004. He was a visiting scholar at University of California, Berkeley and the University of Illinois at Urbana–Champaign's Center for Supercomputing R&D.