NATIONAL UNIVERSITY OF SINGAPORE

School of Computing

C S S E M I N A R

Title: **What have we learned about heterogeneous supercomputing?**

Speaker: Wen-mei W. Hwu
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University of Illinois, Urbana-Champaign

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Venue: Executive Classroom, COM2-04-02

Chaired by: Dr Mitra, Tulika, Professor, School of Computing
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Abstract:

Since the introduction of CUDA in 2006, we have made tremendous progress in heterogeneous computing. We have built heterogeneous top supercomputers. Most of the top supercomputers in the world are heterogeneous computing systems. We have mass-produced heterogeneous mobile computing devices. New standards such as the Heterogeneous Systems Architecture (HSA) are emerging to facilitate software development. Much has been learned about of algorithms, languages, compilers and hardware architecture in this movement. How hard is it to program these systems today? How will we programming these systems in the future? How will heterogeneity in memory devices present further opportunities and challenges? What is the impact on long-term software engineering cost on applications? In this talk, I will go over the lessons learned from educating programmers and developing performance-critical libraries. I will then give a preview of the types of programming systems that will be needed to further reduce the software cost of heterogeneous computing.

Biodata:

Wen-mei W. Hwu is a Professor and holds the Sanders-AMD Endowed Chair in the Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign. He is also CTO of MulticoreWare Inc., chief scientist of UIUC Parallel Computing Institute and director of the IMPACT research group (www.crhc.uiuc.edu/Impact). He directs the UIUC CUDA Center of Excellence and serves as one of the principal investigators of the NSF Blue Waters Petascale supercomputer. For his contributions, he received the ACM SigArch Maurice Wilkes Award, the ACM Grace Murray Hopper Award, the ISCA Influential Paper Award, the IEEE Computer Society B.

R. Rau Award and the Distinguished Alumni Award in Computer Science of the University of California, Berkeley. He is a fellow of IEEE and ACM. Dr. Hwu received his Ph.D. degree in Computer Science from the University of California, Berkeley.