"Do It Early, or Late? The Preference-Oriented Scheduling Framework"

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**TIME**  10:30 am - 11:30 am  
**VENUE**  CS Seminar Room, Y6405, 6th Floor  
Yellow Zone, Academic 1  
City University of Hong Kong  
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**ABSTRACT**

In real-time systems, application tasks normally have deadlines, which define the latest times for the tasks to complete their executions. With the sole objective of meeting tasks’ deadlines, many classical scheduling algorithms have been studied, including the Earliest Deadline First (EDF) and Rate Monotonic Scheduling (RMS). While EDF and RMS adopt the work-conserving approach (where CPU will not be idle when there are ready tasks for executions), there are occasions where it can be beneficial to execute tasks at their latest times. For instance, to provide better response time for aperiodic tasks, the earliest deadline latest (EDL) and dual-priority (DP) algorithms have been studied to schedule co-existing periodic tasks. However, there is no existing scheduling algorithm that can effectively handle a set of periodic tasks with mixed execution preferences.

In this talk, for a set of real-time periodic tasks where some tasks are preferably executed as soon as possible (ASAP) and others as late as possible (ALAP), I will first present the concept of preference-oriented (PO) executions and analyze the PO-optimality of different schedules. Then, focused on dynamic priority scheduling, a Preference-Oriented Earliest Deadline (POED) scheduler will be discussed. Next, based on the concept of promotion time, the Preference-Oriented Fixed-Priority (POFP) scheduler will be introduced, followed by our recent investigation on Preference-Oriented priority assignment schemes. I will also present a few evaluation metrics and discuss our evaluation results. The results show that, compared to the classical EDF/RMS schedulers, the proposed PO-schedulers can effectively process all tasks with significantly improved execution preference fulfillment.

**BIOGRAPHY**

Dakai Zhu received the PhD degree in Computer Science from the University of Pittsburgh in 2004. He joined the Department of Computer Science at The University of Texas at San Antonio (UTSA) in 2005, where he is currently an Associate Professor. His research is in the general area of real-time systems, with the focus on design/development of scheduling algorithms for performance, energy efficient and fault tolerance. He has published more than 50 technical research papers in prestigious conferences and journals. His research has been supported by several grants from US National Science Foundation (NSF), including the Faculty Early Career Development (CAREER) Award in 2010. Dr Zhu served in the technical program committee for many international conferences (including RTSS, RTAS, RTCSA, DATE, DAC, ICPP and IGSC). Dr Zhu also served as the associate editor or guest co-editor for several journals, such as Journal on Sustainable Computing, Informatics and Systems (SUSCOM) and ACM Transactions on Embedded Computing Systems (TECS), in addition to the external reviewer for more than 25 journals. Dr Zhu received his bachelor and master degree from Xi’an Jiaotong University in 1996 and Tsinghua University in 1999, respectively. Dr Zhu is a member of ACM and IEEE.

All are welcome!

*In case of questions, please contact Dr Jason Xue at Tel: 3442 9815, E-mail: jasonxue@cityu.edu.hk, or visit the CS Departmental Seminar Web at [http://www.cs.cityu.edu.hk/news/seminars/seminars.html](http://www.cs.cityu.edu.hk/news/seminars/seminars.html).*