

IEEE CAS\COM Joint Chapter Presents:

Designing the Most Efficient Single-iteration Scheduling Algorithms for Input-queued Switches

Date:

Monday- 12/19/2016

Time:

02:00 p.m. - 4:00 p.m.

Location:

**CEI Building,
University of Windsor
Room 3000
401 Sunset Avenue
Windsor, ON N9B 3P4**

Registration Link:

<https://meetings.vtools.ieee.org/m/42481>

Presenter:

Professor Lawrence Yeung
Email: kyeung@eee.hku.hk

Contact:

Amirali Amirsoleimani
Email: amirsoleimani.a.a@ieee.org

IEEE University of Joint Chapter of Circuits & Systems and Computer presenting a technical seminar:

Input-queued switch is more suitable for high-speed implementation because of its reduced memory bandwidth requirement, where in each time slot at most one packet is sent/received by an input/output port. Iterative scheduling algorithms for input-queued switches are efficient due to the use of massive parallel processing. We focus on designing single-iteration scheduling algorithms because the scheduling overhead is minimized. Based on the principle of highest rank first (HRF), a new approach of designing single-iteration scheduling algorithms will be discussed in this talk. In particular, three algorithms will be covered, HRF-basic, HRF-refined and HRF-RC.

In HRF-basic, VOQs at an input port are ranked according to their queue sizes. The rank of a VOQ, coded using $\log(N+1)$ bits where N is the switch size, is sent to the corresponding output as a request. If there are more than one requests/grants, the arbitration at an output/input is based on highest rank first. We show that HRF-basic outperforms the longest queue first (LQF) algorithm. To enhance the heavy load performance of HRF-basic, an implicit global round robin scheduler is added and the resulting HRF-refined algorithm gives the best-in-class delay-throughput performance. To cut down the request message size to a single bit, HRF with Request Coding (HRF-RC) algorithm is then designed. If time allows, some extension aiming at handling mixed unicast and multicast traffic, as well as packets with variable size, will be discussed.

Presenter Biography:

Lawrence Yeung received his B.Eng. and Ph.D. degrees in Information Engineering from The Chinese University of Hong Kong in 1992 and 1995, respectively. He joined the Department of Electrical and Electronic Engineering, The University of Hong Kong in July 2000, where he is currently a Professor. Lawrence's research interests include wireless data networks, next-generation Internet, packet switch/router design, and all-optical networks.