電腦科學系
Department of
Computer Science

City University of Hong Kong
香港城市大學

COMPUTER SCIENCE COLLOQUIUM

Tight & Simple Load Balancing

SPEAKER **Prof. Peter KLING**

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Department of Informatics
University of Hamburg
Germany

DATE 11 September 2019 (Wednesday)
TIME ~~14:15 pm - 15:00 pm~~ 3:30 pm – 4:30 pm
VENUE ~~CS Seminar Room, Y6405~~
~~6th Floor, Yellow Zone~~
Y4302, 4th Floor, Yellow Zone
Yeung Kin Man Academic Building
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ABSTRACT

Load balancing with discrete load items is among the most important primitives in diverse areas of distributed computing. The typical goal is to design a robust, simple, and fast process that manages to distribute m tokens as evenly as possible among n nodes, no matter how skewed the initial distribution is. Given the basic and fundamental nature of this problem, one also strives to gain a simple analysis, which makes it easy to understand why a given load balancing scheme works well.

With the following simple and natural process, we achieve all of the above goals: In each time step a pair of nodes is selected uniformly and their tokens are distributed evenly among the two of them (one of them getting an extra token if the number of tokens is odd). We provide a simple analysis showing that this process reaches almost perfect balance within $O(n \log(n) + n \log(D))$ steps with high probability, where D is the maximal initial load difference between any two nodes. This bound is asymptotically tight.

BIOGRAPHY

Prof. Peter Kling is currently an assistant professor in the Department of Informatics at the University of Hamburg. He received his Diploma in Mathematics as well as his M.Sc. in Computer Science in 2010 and his Ph.D. in 2014 from the University of Paderborn. He then spent time as a postdoc at the University of Pittsburgh (Pennsylvania, USA) and at the Simon Fraser University (Vancouver, Canada) before joining the Informatics Department in Hamburg. His research interests include the analysis and design of algorithms in areas such as combinatorial optimization, resource allocation, stochastic processes, and distributed computing.

All are welcome!

In case of questions, please contact Dr LI Minming at Tel: 3442 9538, E-mail: minming.li@cityu.edu.hk, or visit the CS Departmental Seminar Web at http://www.cs.cityu.edu.hk/.