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香港中文大學
The Chinese University of Hong Kong

Institute of Theoretical Computer Science and Communications

IE - ITCSC Joint Seminar

Scaling laws- how useful are they at predicting network performance?

By
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11:00am – 12:00noon

Room 1009, William M. W. Mong Engineering Building, CUHK

Abstract: The use of scaling as a mathematical device in the study of multi-hop and ad hoc networks really can be traced to the landmark paper of Kumar and Gupta. Since then there have been a plethora of papers that deal with various aspects such as throughput-delay tradeoffs, order asymptotics, throughput and delay order, etc. And yet, it turns out that there is not some standard model that is being used. Some use dense scaled networks, others use extended scaling, etc and so a natural question that can be asked is : are these results of any use at all or how good are they at predicting performance? In a given situation, which scaling law should we use?

In the talk I will begin with the basic notion of scaling and give examples when it is useful. I will then go on to show that many of the scaling results are highly assumption dependent and completely break down when we change even a small part of the hypotheses and thus such results are merely mathematical games that serve very little purpose.

Biography: The speaker was educated at the Indian Institute of Technology, Bombay (B.Tech, 1977), Imperial College, London (MSc, DIC, 1978) and UCLA (PhD, 1983).

He is currently a University Research Chair Professor in the Dept. of ECE at the University of Waterloo, Ont., Canada where he has been since September 2004. Prior to this he was Professor of ECE at Purdue University, West Lafayette, USA where he continues to be an Adjunct Professor.

He is a past editor of the IEEE/ACM Trans on Networking and has served as guest editor for a number of special issues of networking and applied probability related journals. He is a Fellow of the IEEE and the Royal Statistical Society. He is a recipient of the INFOCOM 2006 Best Paper Award and was runner-up for the Best Paper Award at INFOCOM 1998.

His research interests are in modeling, control, and performance analysis of both wireline and wireless networks, and in applied probability and stochastic analysis with applications to queueing, filtering, and optimization.

******* ALL ARE WELCOME *******

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