

# NATIONAL UNIVERSITY OF SINGAPORE

School of Computing

## C S S E M I N A R

**Title:            Joint Software-Defined Application-Network Control Plane for Next Generation Telepresence Applications**

Speaker:        Klara Nahrstedt, Ralph and Catherine Fisher Professor  
                  Computer Science Department  
                  University of Illinois at Urbana-Champaign (UIUC)  
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Date/Time:     30 July 2015, Thursday, 02:00 PM to 03:30 PM

Venue:          Executive Classroom, COM2-04-02

Chaired by:    Dr Zimmermann, Roger, Associate Professor, School of Computing  
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### Abstract:

Current real-time multimedia applications such as telepresence systems require a very strong real-time interactivity. Requirements are even more stringent in multi-stream and multi-site teleimmersive applications due to strong dependencies across geographically distributed streams. In this talk, I will argue for a joint software-defined application-network control plane to assist the next generation real-time applications such as telepresence and teleimmersion. Furthermore, I will discuss OpenSession, the new 'Northbound' application-network control plane for multi-stream and multi-site real-time applications, which represents the interaction between the application-level session controller and Software-Defined Network (SDN) controller. OpenSession aims to improve end-to-end latency, bandwidth utilization and scalability by decoupling application data transport and control functionality, and partially offload the data transport functionalities to network layer switches. The offloading of application transport and control functions to network switches during their session run-time happens via OpenSession by leveraging the SDN (e.g., OpenFlow) assistance. The experiments with the OpenSession application-network control plane are very encouraging, since OpenSession improves greatly the performance, interactivity and resources usage of our real-time applications such as the 3D Teleimmersion.

### Biodata:

Klara Nahrstedt is the Ralph and Catherine Fisher Professor in the Computer Science Department, and Director of Coordinated Science Laboratory in the College of Engineering

at the University of Illinois at Urbana-Champaign. Her research interests are directed toward 3D teleimmersive systems, mobile systems, Quality of Service (QoS) and resource management, Quality of Experience in multimedia systems, and real-time security in mission-critical systems. She is the co-author of widely used multimedia books 'Multimedia: Computing, Communications and Applications' published by Prentice Hall, and 'Multimedia Systems' published by Springer Verlag. She is the recipient of the IEEE Communication Society Leonard Abraham Award for Research Achievements, University Scholar, Humboldt Award, IEEE Computer Society Technical Achievement Award, ACM SIGMM Technical Achievement Award, and the former chair of the ACM Special Interest Group in Multimedia. She was the general chair of ACM Multimedia 2006, general chair of ACM NOSSDAV 2007 and the general chair of IEEE Percom 2009.

Klara Nahrstedt received her Diploma in Mathematics from Humboldt University, Berlin, Germany in numerical analysis in 1985. In 1995 she received her PhD from the University of Pennsylvania in the Department of Computer and Information Science. She is ACM Fellow, IEEE Fellow, and Member of the Leopoldina German National Academy of Sciences.