

Virtual Reality and Networking: the Challenges of the Multi-source Multi-destination Streaming

SPEAKER Dr Marie-José MONTPETIT

Member of the IEEE Standing
Committees on DSP and Virtual
Realities

DATE 29 March 2017 (Wednesday)

TIME 9:30 am - 10:30 am

VENUE CS Seminar Room, Y6405, 6th Floor
Yellow Zone, Academic 1
City University of Hong Kong
83 Tat Chee Avenue
Kowloon Tong

ABSTRACT

Virtual reality (VR) is upon us. Applications allow us to visit distant lands, experience the exhilaration of roller coasters and take quiet walks in the woods. But for now these have been personal experiences and while generated in real-time are not really "live" and we have not yet met anyone in VR. Why not? Doing VR over a network is challenging the bases of any network and the Internet in particular. The sources of a VR experience can be multiple: images, geo-synchronized augmented reality, sensors to generate physical responses, haptics etc. All of that needs to be synchronized so the participants stay immersed in the experience and not become distracted or even physically sick. Add more than one participant to the mix and the problem gets even more complicated. Unless you can rely on high quality networks the promises of VR for everyone is mote. Yet, game developers, movie makers and a lot of industries already see the value of the "multi-source" "multidestination" (MSMD) applications for enhances gaming, interactive documentaries, training and apprenticeships and fitness programs. The presentation will address some of the current research to address the MSMD. Future Internet Architectures such as Information Centric Networking with their concept of named based distributed caching offer one interesting avenues on how to distribute and stage the content. Network coding allows to get away from the NP Hard problems of precise synchronisation by allowing to keep streams flowing even if the presence of network level impairments. It also improves cache hit ratio in distributed storage and peer-to-peer and opportunistic networks that are also essential for the MSMD. While a lot of these problems can be addressed with simulation, Markov chain analysis and in particular queues with vacations allow to gain insight into the behavior of the MSMD and provide mechanisms to predict performance.

BIOGRAPHY

Dr Marie-José Montpetit is a well-known Internet Architect and visionary. More recently her research has focused on Virtual Reality Networking and multi-source multi-destination streaming. She presented on the topic at the invitation only National Institute of Standards in May 2016. She currently is advising Boston Area startups and Internet companies on Internet performance aspects. She was a research scientist at the Research Laboratory of Electronics at MIT focusing on network coding from 2009-2014. She was French Government Fellow at ISAE/Supareo in 2014 working on different applications for Internet performance including Network Coding. From 2008-2015 she was also an invited scientist at the MIT Media Laboratory teaching a class on converged video applications that got her a mention in the MIT Technology Review as a "TR 10" (the 10 technologies that will shape the future). Dr Montpetit received a Ph.D. in EECS from the Ecole Polytechnique in Montreal, Canada. She is a member of the IEEE Standing Committees on DSP and Virtual Realities and collaborated to the ETSI Broadband Satellite Multimedia working group on aspects of IP convergence. She is well known at the Internet Engineering Task Force and Internet Research Task Force for her contribution in Internet Transport. She was the recipient of the Motorola Innovation Prize in 2007 for the development of a multi-screen and multi-network video mobility system. Her work on converged video applications and multi-screen IPTV has gotten her many invited papers and keynote presentations.

All are welcome!



In case of questions, please contact Dr Jianping Wang at Tel: 3442 7737, E-mail: jianwang@cityu.edu.hk, or visit the CS Departmental Seminar Web at <http://www.cs.cityu.edu.hk/news/seminars/seminars.html>.