



- **Title:** How Should Cross-layer Design Be Done for Wireless Networks?
- **Speaker:** Yuguang "Michael" Fang,
Department of Electrical and Computer Engineering,
University of Florida
- **Time:** 2013年5月27日 15: 30-17: 00pm
- **Venue:** 1-415 FIT Building, Tsinghua

Abstract:

Cross-layer design has been a hot topic in the last few years in wireless networking research due to the fact that the traditional layering network protocol suite such as TCP/IP for wired networks are no longer efficient in wireless networks, particularly true for multi-hop wireless ad hoc networks. Although there are many papers on cross-layer design, few of them really touch upon the essence of the cross-layer design, most of them still cross physical layer and link layer for one-hop transmissions and do not reveal the real layering coupling of multiple layers. There are indeed a few papers that formulate the cross-layer design as an optimization problem and attempt to optimize all layers. Unfortunately, most optimization problems are either too difficult to solve (often may not have feasible solutions), or too idealistic to come up with practical cross-layer solution. In this talk, the speaker will present a novel approach to cross-layer design: boosting the network performance while keeping the implementation practical. This approach attempt to use the MAC layer as the anchor and extract/abstract the information about the channel environment using certain novel metrics (such as the channel busyness ratio) and then tie these parameters to higher layer performance optimization. He will use a few design examples(distributed flow/congestion control and medium access, the wireless congestion control protocol , and multi-user diversity) to demonstrate the more appropriate way to do cross-layer design.

Biography:

Yuguang "Michael" Fang (F'08) received a Ph.D. degree in Systems Engineering from Case Western Reserve University in January 1994 and a Ph.D. degree in Electrical Engineering from Boston University in May 1997. He was an assistant professor in the Department of Electrical and Computer Engineering at New Jersey Institute of Technology from July 1998 to May 2000. He then joined the Department of Electrical and Computer Engineering at University of Florida in May 2000 as an assistant professor, got an early promotion to an associate professor with tenure in August 2003 and to a full professor in August 2005. He holds a University of Florida Research Foundation (UFRF) Professorship from 2006 to 2009, a Changjiang Scholar Chair Professorship with Xidian University, Xi'an, China, from 2008 to 2011, and a Guest Chair Professorship with Tsinghua University, China, from 2009 to 2012. He has published over 300 papers in refereed professional journals and conferences. Dr. Fang received the National Science Foundation Faculty Early Career Award in 2001 and the Office of Naval Research Young Investigator Award in 2002, and is the recipient of the Best Paper Award in IEEE International Conference on Network Protocols (ICNP) in 2006 and the recipient of the IEEE TCGN Best Paper Award in the IEEE High-Speed Networks Symposium, IEEE Globecom in 2002. He has also received a 2010-2011 UF Doctoral Dissertation Advisor/Mentoring Award, 2011 Florida Blue Key/UF Homecoming Distinguished Faculty Award and the 2009 UF College of Engineering Faculty Mentoring Award.

Dr. Fang is also active in professional activities. He is a Fellow of IEEE and a member of ACM. He is currently serving as the Editor-in-Chief for IEEE Transactions on Vehicular Technology (2013-present). He served as the Editor-in-Chief for IEEE Wireless Communications (2009-2012) and serves/served on several editorial boards of technical journals including IEEE Transactions on Mobile Computing (2003-2008, 2011-present), IEEE Transactions on Communications (2000-present), IEEE Transactions on Wireless Communications (2002-2009), IEEE Journal on Selected Areas in Communications (1999-2001), IEEE Wireless Communications Magazine (2003-2009) and ACM Wireless Networks (2001-present). He served on the Steering Committee for IEEE Transactions on Mobile Computing (2008-2010). He has been actively participating in professional conference organizations such as serving as the Technical Program Co-Chair for IEEE INFOCOM' 2014, the Steering Committee Co-Chair for QShine (2004-2008), the Technical Program Vice-Chair for IEEE INFOCOM'2005, the Technical Program Area Chair for IEEE INFOCOM (2009-2013), Technical Program Symposium Co-Chair for IEEE Globecom'2004, and a member of Technical Program Committee for IEEE INFOCOM (1998, 2000, 2003-2008).

Organizer: SIST

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