IEEE-Vietnam Workshop on Advanced Wireless Communications

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PROGRAMME

Time: From 8h00 to 11h00, June 27, 2013

Venue: Seminar Room, Building S4, Le Quy Don Technical University (Học viện KTQS)

236 Hoang Quoc Viet, Nghia Do, Ha Noi

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Time	Talk title	Presenter
7h55-8h00	*Welcome address*	IEEE Vietnam Section Chair
8h00-8h45	What is the Role of MIMO Beyond LTE: Massive? Coordinated? mmWave?	Prof. Robert W. Heath Jr, The University of Texas at Austin, USA
8h45-9h30	Will future wireless systems be cooperative, massive, or messy?	Prof. Angel Lozano, Vice-Rector for Research, Universitat Pompeu Fabra, Spain
9h30-9h45	*Coffee break and free talk*	
9h45-10h30	Dualization of Signal Recovery Problems	Prof. Dinh Dũng Information Technology Institute, Vietnam National University, Hanoi, Vietnam
10h30-11h0	On the Performance of Cognitive Underlay Multihop Networks with Imperfect Channel State Information	Dr. Vo Nguyen Quoc Bao, Posts and Telecommunications Institute of Technology, Vietnam

Title: What is the Role of MIMO Beyond LTE: Massive? Coordinated? mmWave?

Professor Robert W. Heath Jr, PhD.
The University of Texas at Austin

Abstract: MIMO communication exploding again – this time in the number of antennas. Massive MIMO brings hundreds of antennas at the base station serving tens of uses ala multiuser MIMO. Coordinated MIMO coordinates dozens of antennas at different base stations to reduce the effects of interference. mmWave MIMO uses large arrays at base station and user equipment to serve multiple users with narrow beams and lots of spectrum. This talk will explain key features of each technology and then will provide comparisons of coverage and capacity using a mathematical framework built around stochastic geometry.

Biography: Robert W. Heath Jr. received the Ph.D. in EE from Stanford University. He is currently a Professor in the Department of Electrical and Computer Engineering at "The University of Texas at Austin" and Director of the Wireless Networking and Communications Group. He is also the President and CEO of MIMO Wireless Inc and Chief Innovation Officer at Kuma Signals LLC.

Prof. Heath has been an Editor for the IEEE Transactions on Communication, an Associate Editor for the IEEE Transactions on Vehicular Technology, lead guest editor for an IEEE JSAC special issue on limited feedback communication, and lead guest editor for an IEEE JSTSP special issue on Heterogenous Networks. He currently serves on the steering committee for the IEEE Transactions on Wireless Communications. He was a technical co-chair for the 2007 Fall Vehicular Technology Conference, general chair of the 2008 Communication Theory Workshop, general co-chair, technical co-chair and co-organizer of the 2009 IEEE Signal Processing for Wireless Communications Workshop, local co-organizer for the 2009 IEEE CAMSAP Conference, technical co-chair for the 2010 IEEE International Symposium on Information Theory, the technical chair for the 2011 Asilomar Conference on Signals, Systems, and Computers, general chair for the 2013 Asilomar Conference on Signals, Systems, and Computers, general co-chair for the 2013 IEEE GlobalSIP conference, and is technical co-chair for the 2014 IEEE GLOBECOM conference.

Prof. Heath was a co-author of best student paper awards at IEEE VTC 2006 Spring, WPMC 2006, IEEE GLOBECOM 2006, IEEE VTC 2007 Spring, and IEEE RWS 2009, as well as co-recipient of the Grand Prize in the 2008 WinTech WinCool Demo Contest. He was co-recipient of the 2011 EURASIP Journal on Wireless Communications and Networking best paper award and the 2012 Signal Processing Magazine Best Paper award.He is the recipient of the David and Doris Lybarger Endowed Faculty Fellowship in Engineering, a licensed Amateur Radio Operator, is a registered Professional Engineer in Texas, and is a Fellow of the IEEE.

Title: Will future wireless systems be cooperative, massive, or messy?

Professor Angel Lozano, PhD.
Vice-Rector for Research, Universitat Pompeu Fabra.

Abstract: Motivated by fundamental information-theoretical results, MIMO (multiple input multiple output) communication emerged with force in the late 1990s and, in record time, made its way into a central feature of commercial wireless systems. We will –briefly– review how MIMO has grown and developed, and assess its current standing. Then, we will examine the challenges faced by wireless systems today and, in particular, by macro-cellular systems: the foundation of the wireless revolution. We will see how MIMO principles are being applied to tackle those challenges, and discuss various competing approaches. Finally, we will speculate on what the future might hold for macro-cellular systems, and on their potential roles in the complex wireless communications landscape that is shaping up.

Biography: Angel Lozano is a Professor of Information and Communication Technologies at UPF (Universitat Pompeu Fabra) in Barcelona, Spain, where he teaches and conducts research on wireless communications as head of the WiCom (Wireless Communications) Group. He is also UPF's Vice-Rector for Research.

Prof. Lozano received the Master of Science and Ph.D. degrees in Electrical Engineering from Stanford University, USA, in 1994 and 1998, respectively. In 1999, he joined Bell Labs (Lucent Technologies, now Alcatel-Lucent) in Holmdel, USA, where he was a member of the Wireless Communications Research Department until 2008. Between 2005 and 2008 he was also an Adjunct Associate Professor of Electrical Engineering at Columbia University, NY, USA.

Prof. Lozano is an associate editor for the IEEE Transactions on Information Theory (since 2011), a former editor for the IEEE Transactions on Communications (1999-2009) and the Journal of Communications & Networks (2010-2012), has guest-edited various journal special issues, and is actively involved in committees and conference organization tasks for the IEEE. In particular, he is the Chair of the IEEE Communication Theory Technical Committee (2013-2014) and was elected to the Board of Governors of the IEEE Communications Society (2012-2014). He has further participated in standardization activities for 3GPP, 3GPP2, IEEE 802.20 and the IETF.

Prof. Lozano has published extensively, holds 15 patents, and has contributed to several books. His papers have received two awards: the best paper at the 2006 IEEE Int'l Symposium on Spread Spectrum Techniques & Applications, and the Stephen O. Rice prize to the best paper published in the IEEE Transactions on Communications in 2008. He also received the Bell Labs President's Gold Award in 2002 and the ICREA Academia Award from the Catalan Government in 2011.

Title: Dualization of Signal Recovery Problems

Prof. Dinh Dũng
Information Technology Institute, Vietnam National University, Hanoi, Vietnam

Abstract: Over the years, several structured frameworks have been proposed to unify the analysis and the numerical solution methods of signal (including image) recovery problems. In convex optimization, duality theory can sometimes lead to simpler solution methods than those resulting from direct primal analysis. We propose an approach of the principle of convex duality which is applied to a class of composite variational problems arising particularly in signal recovery. These problems are not easily amenable to solution by current methods but they feature Fenchel–Moreau–Rockafellar dual problems that can be solved by a forward-backward splitting algorithm. The proposed algorithm produces simultaneously a sequence converging weakly to a dual solution, and a sequence converging strongly to the primal solution. Our framework is shown to capture and extend several existing duality-based signal recovery methods and to be applicable to a variety of new problems beyond their scope.

Biography: Đinh Dũng received the BS, MS, PhD and DrSc in Mathematics from the Moscow Lomonosov State University. He has been appointed as a full professor at the Vietnam Academy of Science and Technology (VAST) and at the Vietnam National University (VNU) from 1991. During 1993-1998 he was the director of the Division of Mathematical Aspects of Information Technology, Institute of Information Technology, VAST. During 1998-2001 he was the president of the Scientific Council of the Institute of Information Technology, VAST. During 2001-2008 he was the director of the Information Technology Institute, VNU. Professor Đinh Dũng is the vice president of the Scientific Council of the Communication and Computer Sciences Division of the National Foundation for Science and Technology Development (Vietnam). He is a member of the Computer Science Division of the National Council for Professor Appointment (Vietnam). He was a plenary speaker at the Third Asian Mathematical Conference, October 23-27, 2000, Manila, and an keynote and invited speaker in many conferences and workshops. He has published over 70 articles in journals. He is a member of the Editorial Board of Vietnam Journal of Mathematics, East Journal on Approximations and Southeast Asian Bulletin of Mathematics.

Title: On the Performance of Cognitive Underlay Multihop Networks with Imperfect Channel State Information

Vo Nguyen Quoc Bao, Ph.D
Posts and Telecommunications Institute of Technology (PTIT)

Abstract: In this talk, I propose and analyze cognitive multihop decode-and-forward (DF) networks in the presence of interference due to channel estimation errors. To reduce interference on the primary network, a simple yet effective backoff control power method is applied for secondary multihop networks. For a given threshold of interference probability at the primary network, we derive the maximum backoff control power coefficient, which provides the best performance for secondary multihop networks. Moreover, it is shown that the number of hops for secondary network is upper-bounded under the fixed settings of the primary network. For secondary multihop networks, new exact and asymptotic expressions for outage probability (OP), bit error probability (BEP) and ergodic capacity over Rayleigh fading channels are derived. Based on the asymptotic OP and BEP, a pivotal conclusion is reached that the secondary multihop network offers the same diversity order as compared with the network without back off. Finally, I verify the performance analysis through various numerical examples confirming the correctness of our analysis for many channel and system settings and providing new insight into the design and optimization of cognitive multihop networks.

Biography: Vo Nguyen Quoc Bao (in Vietnamese: Võ Nguyễn Quốc Bảo) was born in Nha Trang, Khanh Hoa Province, Vietnam. He received the B.E. and M.Eng. degree in electrical engineering from Ho Chi Minh City University of Technology (HCMUT), Vietnam, in 2002 and 2005, respectively, and Ph.D. degree in electrical engineering from University of Ulsan, South Korea, in 2009. In 2002, he joined the Department of Electrical Engineering, Posts and Telecommunications Institute of Technology (PTIT), as a lecturer. Since February 2010, he has been with the Department of Telecommunications, PTIT, where he is currently an Assistant Professor. His major research interests are modulation and coding techniques, MIMO systems, combining techniques, cooperative communications, and cognitive radio. Dr. Bao is a member of Korea Information and Communications Society (KICS), The Institute of Electronics, Information and Communication Engineers (IEICE) and The Institute of Electrical and Electronics Engineers (IEEE). He is currently serving as the Editor of Transactions on Emerging Telecommunications Technologies (Wiley ETT). He is also a Guest Editor of EURASIP Journal on Wireless Communications and Networking, special issue on "Cooperative Cognitive Networks" and IET Communications, special issue on "Secure Physical Layer Communications".