

Title: A little knowledge is truly a dangerous thing: interference pre-cancellation in the presence of partial channel knowledge

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Date: June 29, 2016, 11 a.m.

Abstract:

Interference pre-cancellation is a fundamental coding technique for multi-terminal networks and many classic information theoretic results rely on this strategy. Despite of this, implementations of this coding scheme have yet to find widespread application in practical communication networks and one is bound to wonder as of why this is the case. In this talk we argue that interference pre-cancellation is effective only when very precise channel estimates are available at the users, a condition which is not easily attainable in many communication networks. The ability of a transmitter to pre-cancel the interference experienced at the receiver is drastically reduced when only partial side channel information is available. For this reason, we investigate the topic of robust interference cancellation and show that substantial coding advantages can be attained only when exploiting the structure of the interfering signal.

Bio:

Stefano Rini received the B.A. degree in computer science from the Politecnico di Milano, Italy, in 2005, the M.S. degree in both Electrical and Computer Engineering and Statistics from the University of Illinois at Chicago (UIC) in 2009. He earned his doctoral degree in Electrical and Computer Engineering at the University of Illinois in Chicago (UIC) in 2011, with adviser Professor Tuninetti and co-adviser Professor Devroye, with a thesis titled "Cognition and Cooperation in Wireless Networks: an Information Theoretic Perspective". In 2012, he was a postdoctoral fellow at the Institute for Communications Engineering at the Technical University of Munich (TUM), Germany with Professor Kramer. In 2013 he was a postdoctoral fellow at the Department of Electrical Engineering at Stanford University with Professor Goldsmith. He is currently an assistant professor at the Department of Communication Engineering, National Chiao-Tung University (NCTU), Taiwan.