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**SPEAKER:** Alex Reznik, Interdigital, Inc.  
**DATE:** Thursday, March 5th  
**TIME:** 4:30 pm  
**TITLE:** Extracting Information-Theoretic Keys from Wireless Channels

**ABSTRACT:** We start with a brief overview of the Source Model for information-theoretic secret communication as defined in the work of Ahlswede/Csiszar and Maurer and argue that under certain assumptions on system operation this is a natural description of the wireless channel as observed by two communicating parties. Based on this observation we demonstrate how information-theoretic secret key generation algorithms are adapted to the purpose of key extraction from wireless channels. This leads us to a high-level system design for wireless channel secret key extraction. We then proceed to overview how this high-level approach has been implemented on top of a fully standard compliant 802.11 system. In doing so, we will highlight some real-world challenges that had to be addressed. In particular we'll discuss a new quantization and key agreement protocol designed to work over unknown source distributions. Finally, we'll show some results on the key rates that may be obtained from wireless channels and discuss how to utilize these in real-world wireless systems. The work presented here is joint work with Chunxuan Ye and Yogendra Shah at InterDigital and Suhas Mathur, Wade Trappe and Narayan Mandayam at Winlab, Rutgers, U.

**BIO:** Alex Reznik earned his BSEE from The Cooper Union, SM in EECS from Massachusetts Institute of Technology and PhD in EE from Princeton University in 1996, 1998 and 2005 respectively. During 2000-2002 he held a MURI fellowship at Princeton University. Dr. Reznik has been with InterDigital since 1999 where he is currently a Principal Engineer in the CTO organization and holds a visiting faculty appointment at Winlab, Rutgers University. His research interests are in information and communication theory and architecture and design of modern communication systems and devices. He is an inventor or co-inventor on over 30 granted US patents and has been awarded the Presidents and CTO's innovation awards at InterDigital.

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