

Information Science and Technology Seminar Speaker Series



Dr. Rüdiger Urbanke
Swiss Federal Institute of Technology in Lausanne

Teaching an old code a new trick.

Tuesday, November 24, 2015

3:00 - 4:00 PM

TA-3, Bldg. 1690, Room 102 (CNLS Conference Room)

Abstract: Our digital lives depend heavily on our ability to efficiently and reliably transmit information over long distances. It is therefore not surprising that much effort has been dedicated to devising clever schemes to accomplish this. I will go back in time to Reed-Muller codes, one of the pioneering codes discovered in the mid fifties and I will ask the question: *"What do you get when you combine these classical algebraic codes, EXIT functions from iterative coding, and the fact that monotone symmetric Boolean functions have sharp thresholds?"*

[Based on joint work with S. Kudekar, S. Kumar, M. Mondelli, H. D. Pfister, and E. Sasoglu]

Biography: Rüdiger L. Urbanke obtained his Dipl. Ing. degree from the Vienna University of Technology, Austria in 1990 and the M.Sc. and PhD degrees in Electrical Engineering from Washington University in St. Louis, MO, in 1992 and 1995, respectively.

He held a position at the Mathematics of Communications Department at Bell Labs from 1995 till 1999 before becoming a faculty member at the School of Computer & Communication Sciences (I&C) of EPFL. He is a member of the Information Processing Group.

He is principally interested in the analysis and design of iterative coding schemes, which allow reliable transmission close to theoretical limits at low complexities. Such schemes are part of most modern communications standards, including wireless transmission, optical communication and hard disk storage. More broadly, his research focuses on the analysis of graphical models and the application of methods from statistical physics to problems in communications.

From 2000-2004 he was an Associate Editor of the IEEE Transactions on Information Theory and he is currently on the board of the series "Foundations and Trends in Communications and Information Theory." Since 2013 he has been a Member of the Board of the Information Theory Society as well as a Distinguished Speaker. From 2009 till 2012 he was the head of the I&C doctoral school and in 2013 he served as Dean a. i. of I&C.

Dr. Urbanke is a recipient of a Fulbright Scholarship. He is a co-author of the book "Modern Coding Theory" published by Cambridge University Press a co-recipient of the 2002 and the 2013 IEEE Information Theory Society Paper Award, the 2011 IEEE Koji Kobayashi Award, as well as the 2014 IEEE Hamming Medal.

For more information contact the technical host Mark Vuffray vuffray@lanl.gov, 667-3921.

Hosted by the Information Science and Technology Institute (ISTI)