Title 1:
"Zero-Crossing Precoding for Channels With 1-Bit Quantization and Oversampling"

Place & Time: Kirchhoffbau K2001 at 10:00 a.m.

Abstract 1:

Systems with coarse quantization have attracted a great interest due to the low complexity and low energy consumption requirements of new applications as IoT. In this study, we present a novel waveform for the bandlimited channel with 1-bit quantization and oversampling. The novel method implies that the information is conveyed within the time instances of zero-crossings, which is devised together with a space-time MMSE precoding. Numerical evaluations of the BER show that the proposed approach outperforms the existing method and that the MMSE criterion yields a benefit in comparison to the maximum distance to decision threshold criterion for low SNR.

Title 2:
"Optimal and Suboptimal MMSE Precoding for Multiuser MIMO Systems With Phase Quantization"

Place & Time: Kirchhoffbau K2001 at 14:00 p.m.

Abstract 2:

We propose an optimal MMSE precoding technique using quantized signals with constant envelope and PSK modulation.

Unlike the existing MMSE design for 1-bit resolution, the proposed method employs uniform phase quantization and the bounding step in the branch-and-bound method is different in terms of considering the most restrictive relaxation of the nonconvex problem, which is then utilized for a suboptimal design also.

Numerical simulations show that using the MMSE criterion instead of the established maximum distance to decision threshold yields a lower BER in many scenarios and a smaller average number of bound evaluations for low and medium SNR.

Short Bio:

Lukas Landau received the B.Sc. and the M.Sc. degrees in electrical engineering from Ilmenau University of Technology, Germany, in 2009 and 2011, respectively, and the Ph.D. degree in electrical engineering from Technische Universität Dresden, Germany, in 2016. Since July 2016, he has been with the Center for Studies in Telecommunications, Pontifical Catholic University of Rio de Janeiro, Brazil, where he is now Assistant Professor. He currently serves as an associate editor for the EURASIP Journal on Wireless Communications. His research interests lie in communications and signal processing.