

SPCOMIT Seminar Invitation

Title: Joint Estimation of Carrier Frequency Offset and Channel Impulse Response for Linear Periodic Channels.

Speaker: Roei Shaked (BGU)

Abstract

In many communications scenarios the channel exhibits periodic characteristics. Among the major examples of such scenarios, we can note power line communications, interference-limited communications and mobile radio communications. In this work, we study pilot-aided joint estimation of the channel impulse response (CIR) and of the carrier frequency offset (CFO) for linear periodic channels in which both the CIR and the noise statistics vary periodically in time.

We first consider the joint maximum likelihood estimator (JMLE) for the CIR and the CFO, and discuss the practical drawbacks associated with this estimator. When the coefficients of the delay Doppler spread function of the CIR are approximately sparse, we propose two estimation schemes with higher spectral efficiency and lower computational complexity compared to the JMLE, obtained by exploiting both the periodicity and the sparsity of the channel, without requiring a-priori knowledge of the sparsity pattern. Finally, we study the design of pilot sequences aimed at improving the estimation performance in sparse periodic channels. The proposed estimation schemes are numerically tested in a simulation study corresponding to practical scenarios, and the results demonstrate that substantial benefits can be obtained by properly accounting for the sparsity and periodicity in the design of the estimation scheme.

The seminar will take place on **Thursday, 15-6-2017, 11:10, in room 102 building 33.**