

SPCOMIT Seminar Invitation

Title: A Risk-Unbiased Approach to Performance Bounds and Optimal Parameter Estimation.

Speaker: Shahar Bar (BGU)

Abstract

How accurately can one estimate a parameter of interest subject to other unknown deterministic model nuisance parameters? The most popular answer to this question is given by the Cramer-Rao bound (CRB). The main assumption behind the derivation of the CRB is local unbiased estimation of all model parameters. The foundations of this work rely on doubting this assumption. Generally, in multivariate parameter estimation, each parameter in its turn can be treated as a single parameter of interest, while the other model parameters are treated as nuisance, as their mis-knowledge interferes with the estimation of the parameter of interest. This approach is utilized in this work to provide a fresh look at deterministic and random parameter estimation. Correspondingly, we derive new Cramer-Rao (CR)-type bounds with no assumption of unbiasedness on the nuisance parameters. Alternatively, Lehmann's concept of unbiasedness is employed rather than conventional mean-unbiasedness. It is imposed for a risk that measures the distance between the estimator and the optimal estimator in the mean-squared-error sense. The proposed bounds are proven to be tighter than the conventional CRB and hybrid CRB. Furthermore, simulations verify the asymptotic achievability of the proposed bounds by the maximum likelihood estimator in signal processing problems.

The seminar will take place on **Monday, 26-6-2017, 12:10, in room 102 building 33.**