Lecture 8.1 (10:35-11:00)

A stochastic optimization approach to minimize robust density power-based divergences for general parametric density models

Akifumi Okuno (ISM)

Density power divergence (DPD), which is designed to estimate the underlying distribution of the observations robustly against outliers, comprises an integral term of the power of the parametric density models to be estimated. While the explicit form of the integral term can be obtained for some specific densities (such as normal density and exponential density), its computational intractability has prohibited the application of DPD-based estimation to more general parametric densities, over a quarter of a century since the proposal of DPD. This study proposes a simple stochastic optimization approach to minimize DPD for general parametric density models and explains its adequacy by referring to conventional theories on stochastic optimization. The proposed approach also can be applied to the minimization of another density power-based γ-divergence with the aid of unnormalized models. https://arxiv.org/abs/2307.05251