Waseda Seminar on Mathematical Statistics

Date: November 8 (Fri.), 2024

Venue: Meeting Room (Dept of Pure & Appl. Math), Building 63-1, Nishi-Waseda Campus, Waseda University
(Access map: https://www.waseda.jp/top/en/access/nishiwaseda-campus)

Program

13:30 ~ 14:15
Semiparametric function estimation with localized Bregman divergence (I)
Kanta Naito (Graduate School of Information Sciences, Tohoku University)

14:15 ~ 14:30
Coffee Break

14:30 ~ 15:15
Semiparametric function estimation with localized Bregman divergence (II)
Kanta Naito (Graduate School of Information Sciences, Tohoku University)

Abstract

Semiparametric function estimation with localized Bregman divergence

Kanta Naito (Graduate School of Information Sciences, Tohoku University)

Abstract: In this talk, general approaches to the problems of function estimation, such as estimating regression or density function, are discussed. Especially, approaches to semiparametric function estimation by combining a parametric crude guess and its localized adjustment are addressed. Usual parametric model determined by a finite dimensional parameter is utilized as a first crude guess of the target function. Some appropriate estimator of the parameter is plugged into the model, which derives a parametric estimator of the target function. The parametric function estimator is adjusted at each estimation point with the use of a kernel weight. Such an adjustment step is implemented via minimization of the localized Bregman divergence, which yields a broad class of semiparametric estimators. Specific concrete forms of estimators under typical divergence and parametric model are shown, which are useful to implement the proposed methods. Asymptotic theories of the proposed methods are developed, which show that the proposed semiparametric estimators asymptotically improve usual parametric and fully nonparametric estimators under some risk measures. Simulations and applications to real data sets also reveal that the proposed estimators perform sometime better numerically than usual estimators under both settings of regression and density estimation.