On the weak convergence and central limit theorem of blurring and nonblurring processes with application to robust location estimation

Ting-Li Chen^{*a}, Hironori Fujisawa^b, Su-Yun Huang^a, Chii-Ruey Hwang^c

a: Institute of Statistical Sciences, Academia Sinica b: Institute of Statistical Mathematics c: Institute of Mathematics, Academia Sinica

Abstract

In this talk, I will first present theoretical properties of the blurring and nonblurring processes including their weak convergence to a Brownian bridge-like process and associated Central Limit Theorem. Then I will apply the derived Central Limit Theorem to the estimation of location parameter. I will present simulation studies comparing location estimation based on using blurring and nonblurring processes. The simulation results suggest that location estimation based on the convergence point of blurring process is more robust and often more efficient than that of nonblurring process.