Variable Selection for High-Dimensional Heteroscedastic Regression and Its Applications

邱海唐

國立中正大學數學系

Abstract

We are examining variable selection in high-dimensional linear heteroscedastic models. Drawing inspiration from the connection between the linear heteroscedastic function and the interaction model, we develop a two-stage algorithm to identify the relevant variables in the model mentioned above. We demonstrate the selection consistency of our proposed two-stage method and highlight its efficacy through numerical simulations. Additionally, in cases where the functional form of heteroscedasticity–whether linear or multiplicative–is unknown, we propose a data-driven method to facilitate the selection between the two. Furthermore, we leverage our method to pinpoint defective tools during the semiconductor manufacturing process. This is joint work with Po-Hsiang Peng, Hsueh-Han Huang, and Ching-Kang Ing.

關鍵詞：High-dimensional interaction model, Linear heteroscedasticity, Model selection, Multiplicative heteroscedasticity