國立中山大學應用數學系
學術演講

講　者：張志浩 教授 (國立政治大學)

講　題：Threshold Boundary Logistic Regression for Binary Data

時　間：2025/4/10（Thursday）14:10 ~ 15:00

地　點：理 SC 4009-1 教室

茶　會：13:45

Abstract

This talk explores the Threshold Boundary Logistic Regression (TBLR) model for binary data analysis, integrating multiple covariates into both logistic regression and threshold functions. The threshold function, which can be linear or nonlinear, defines a hyperplane that partitions data for distinct logistic models. To estimate TBLR, we propose an iterative two-stage sample-splitting algorithm that transforms the non-differentiable maximum likelihood estimation into an optimization framework. Our method optimizes a weighted classification error for threshold estimation while maximizing likelihood functions for logistic regression. Under suitable conditions, we establish consistency, optimal convergence rates, and the asymptotic distribution of estimators. To enhance computational efficiency, we use the Weighted Support Vector Machine (WSVM) for initializing linear threshold estimation via Mixed-Integer Programming (MIP). When MIP struggles with nonlinear threshold functions, WSVM serves as an alternative for constructing nonlinear structures. Extensive simulations and real-data applications highlight the methods superior performance in modeling nonlinear binary data.

Keywords：Maximum likelihood, model-based clustering, support vector machines, mixed integer programming

敬　請　公　告！　歡　迎　參　加！

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