

# 中央研究院統計科學研究所

## 學術演講

講題：Counterfactual Classification

演講人：Prof. Kwangho Kim

Department of Statistics, Korea University

時間：2024-12-12(Thu.) 10:30-12:00

地點：Auditorium, B1F, Institute of Statistical Science ; The tea reception will be held at 10:10.

備註：Lecture in English. Online live streaming through Cisco Webex will be available.

### Abstract

We study counterfactual classification as a new tool for decision-making under hypothetical (contrary to fact) scenarios. We propose a doubly-robust nonparametric estimator for a general counterfactual classifier, where we can incorporate flexible constraints by casting the classification problem as a nonlinear mathematical program involving counterfactuals. We go on to analyze the rates of convergence of the estimator and provide a closed-form expression for its asymptotic distribution. Our analysis shows that the proposed estimator is robust against nuisance model misspecification, and can attain fast root- $n$  rates with tractable inference even when using nonparametric machine learning approaches. We study the empirical performance of our methods by simulation and apply them for recidivism risk prediction.



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