

2023년 제 9회 통계세미나

고려대학교 통계연구소와 BK21 통계학교육연구팀, 그리고 DS+가 다음과 같이 공동으로 세미나를 개최하오니 많은 참여 바랍니다.

일시 : 2023년 6월 2일(금) 오전 11시

장소 : 고려대학교 정경관 206호

연사 : 최영근 교수 (성균관대학교 수학교육과)

Semi-Parametric Contextual Pricing Algorithm using Cox Proportional Hazards Model

<Abstract>

Contextual dynamic pricing is a problem of setting prices based on current contextual information and previous sales history to maximize revenue. A popular approach is to postulate a distribution of customer valuation as a function of contextual information and the baseline valuation. A semi-parametric setting, where the context effect is parametric and the baseline is nonparametric, is of growing interest due to its flexibility. A challenge is that customer valuation is almost never observable in practice and is instead type-I interval censored by the offered price. To address this challenge, we propose a novel semi-parametric contextual pricing algorithm for stochastic contexts, called the epoch-based Cox proportional hazards Contextual Pricing (CoxCP) algorithm. To our best knowledge, our work is the first to employ the Cox model for customer valuation. The CoxCP algorithm has a high-probability regret upper bound of $\tilde{O}(T^{2/3}d)$, where T is the length of horizon and d is the dimension of context. In addition, if the baseline is known, the regret bound can improve to $O(d \log T)$ under certain assumptions. We demonstrate empirically the proposed algorithm performs better than existing semi-parametric contextual pricing algorithms when the model assumptions of all algorithms are correct.

고려대학교 통계연구소
BK21 통계학교육연구팀

