

2021년 제 5회 통계세미나

고려대학교 통계연구소와 BK21 통계학교육연구팀이 다음과 같이 공동으로 세미나를 개최하오니 많은 참여 바랍니다.

일시 : 2021년 5월 14일 (금) 오전 11시

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Statistical Inference with Neural Network Imputation for Item Nonresponse

<Abstract>

We consider the problem of nonparametric imputation using a neural network model. Neural network models can capture complex nonlinear trends and interaction effects, making it a powerful tool for predicting missing values under minimum assumptions on the missingness mechanism. Statistical inference with neural network imputation, including variance estimation, is challenging because the basis for function estimation is estimated rather than known. In this paper, we tackle the problem of statistical inference with neural network imputation by treating the hidden nodes in a neural network as data-driven basis functions. We prove that the uncertainty in estimating the basis functions can be safely ignored in variance estimation and hence the linearization method for neural network imputation can be greatly simplified. A simulation study confirms that the proposed approach results in efficient and well-calibrated confidence intervals even when classic approaches fail due to severe nonlinearity and complicated interactions.

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