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基于网络的精准营销：建立网络中的消费者行为模型

Network Based Targeting: Model Consumer Behavior within a Network

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报告摘要 Abstract

在这篇文章中，我们对网络当中的消费者行为建立了一个模型。这个模型主要解决了两个问题，即网络结构对消费者行为的影响以及网络内生性的问题。我们将网络结构变量引入 **Spatial Autoregressive (SAR) Model**，并根据 **Hsieh and Lee (2016)** 来处理网络形成的内生问题。我们将这个模型应用于电信大数据，并收集了采样周期五个月后的新数据进行样本外预测。我们将我们模型的预测结果与其它两个模型进行对比，结果表明我们的模型最为精准，同时考虑了网络结构的预测比不考虑网络结构的预测效果要好很多。基于此，我们提出了「基于网络的精准营销」新策略。

In this paper, we propose a modeling approach to study consumer behaviors in the context of network. In particular, we address two aspects that are unique to this context, i.e. the effects of network structure and the endogeneity of network formation. We adopt the spatial autoregressive (SAR) model to account for network structure and the correction approach of Hsieh & Lee (2016) to handle the endogeneity of network formation. The model considers the effects of network structure through three channels: (1) local network position of each individual; (2) global network structure as correlated effect; and (3) effect of network structure on peer influence. For empirical application, the model is applied to our proprietary dataset collected from a telecommunication company. Our model provides an applicable tool for companies to select targets in marketing campaigns. We collect additional data five months after the sampling period and conduct out-of-sample predictions using the information of a two-layered snowball sample network for each individual. The results demonstrate the predictive validity of proposed strategy and confirm that incorporating network structure information has great potential to improve individual adoption predictions thus the effectiveness of targeting, especially for new products in the early stage. We name the new strategy “network-based targeting”.