Marketing Colloquium
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Dr. P.K. Kannan

Editor-in-Chief of the *International Journal of Research in Marketing*

Dean’s Chair in Marketing Science

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**Identifying Competitive Market Structures: A Deep Network Representation Learning Approach**

Understanding the competitive market structure is critical for firms to establish an effective marketing strategy for gaining business advantage. Marketing researchers and practitioners have made significant contributions in developing various methods to uncover market structure, mainly focusing on survey-based or observational data-based approaches. However, many of these methods suffer from limitations in several dimensions, such as timeliness, scalability, accuracy, and data availability. On the other hand, social media platforms, such as Facebook, provide us an unprecedented opportunity to observe a very large number of user activities on public brand pages, which can be leveraged for market structure analysis. In order to analyze such large and complex data linking users and brands, we propose a deep network representation learning algorithm to capture latent relationships among brands for market structure inference. In conducting such an analysis, we first build a heterogeneous brand-user network from millions of user-brand engagement data. We then jointly learn brand and user representation via a deep Autoencoder that preserves both the first order (direct connection) and the second order (network structural equivalence) similarity in the network. Our method is different from traditional approaches in that it can better model and learn network representation using a heterogeneous network, unlike prior work typically studying homogeneous networks where deep semantic information (e.g., heterogeneity) are usually ignored. We evaluate our method on a large-scale real-world Facebook dataset, that consists of more than 5,000 Facebook public fan pages. With learned representations, we pictorially visualize market structure among brands. We also illustrate how our method is able to capture the dynamic changes in market structure by using two well-known events: Amazon acquiring Whole Foods and Tesla introducing Model 3.
Short Bio

P. K. Kannan is the Dean’s Chair in Marketing Science at the Robert H. Smith School of Business at the University of Maryland. His research expertise is on marketing modeling, applying statistical, econometric, machine learning, and AI methods to marketing data. His current research stream focuses on digital marketing - mobile marketing, attribution modeling, media mix modeling, new product/service development and customer relationship management (CRM).

He has received several grants from National Science Foundation (NSF), Mellon Foundation, SAIC, and PricewaterhouseCoopers for his work in this area and research papers have been published in *Marketing Science, Management Science, Journal of Marketing Research, Journal of Marketing, and International Journal of Research in Marketing*. His research has also won the prestigious John Little Best Paper Award (2008) and the INFORMS Society for Marketing Science Practice Prize Award (2007). His research has also been selected as a finalist for the Paul Green Award twice (2008, 2014) and he has won the AMA/MSI Paul Root Award twice (2014, 2016).

Dr. Kannan is the Editor-in-Chief of the *International Journal of Research in Marketing*, an Associate Editor for *Journal of Marketing Research*, and serves on the editorial boards of *Marketing Science, Journal of Marketing, Journal of Service Research*. Dr. Kannan has served as the Chair for the American Marketing Association SIG on Marketing Research and has chaired the INFORMS Service Science section.