



TEXAS A&M  
Institute of  
Data Science

## Texas A&M Institute of Data Science Seminar Series

### Identifying Market Structure: A Deep Network Representation Learning of Social Engagement



With rapid technological developments, product-market boundaries have become more dynamic. Consequently, competition for products and services is emerging outside the product-market boundaries traditionally defined based on SIC and NAICS classification codes. Identifying these fluid product-market boundaries is critical for firms not only to compete effectively within a market, but also to identify lurking threats and latent opportunities outside market boundaries. Newly available big data on social media engagement presents such an opportunity. The speaker and his co-authors propose a deep network representation learning framework to capture latent relationships among thousands of brands and across many categories, using millions of social media users' brand engagement data. They build a brand-user network and then compress the network into a lower dimensional space using a deep Autoencoder technique. They

evaluate their approach quantitatively and qualitatively, and visually display the market structure using the learned representations of brands. They validate the learned brand relationships using multiple external data sources, and also illustrate how their method can capture the dynamic changes of product market boundaries using two well-known events – the acquisition of Whole Foods by Amazon and the introduction of the Model 3 by Tesla – and how managers can use the insights that emerge from our analysis.

#### Kunpeng Zhang, Ph.D.

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Information Technologies  
Robert H. Smith School of Business  
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**Date:** Monday, March 28, 2022

**Time:** 1:50 – 2:40 p.m. US Central Time

**Zoom Meeting ID:** 998 4499 3279

**Passcode:** 724615

**Faculty host:** Bin Zhang, INFO

#### Biography

Dr. Kunpeng 'KZ' Zhang is currently an Assistant Professor of Information Systems at the University of Maryland, College park. His research mainly focuses on large-scale unstructured social media analytics by developing and applying machine learning algorithms. He currently serves as Associate Editor of INFORMS Journal on Computing. For more details, please see his website: <https://kpzhang.github.io>.

You can also click this link to join the seminar <https://tamu.zoom.us/j/99844993279?pwd=TkJodWFVRURyMmkwakl4SWZGeVJTQT09>



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For more information about TAMIDS seminar series, please contact Ms. Jennifer South at [jsouth@tamu.edu](mailto:jsouth@tamu.edu)