



TEXAS A&M  
Institute of  
Data Science

# Texas A&M Institute of Data Science Seminar Series

## Tracking Consumers: The Trade-off between the Value of Granular Data and Consumers' Privacy



Most mobile apps have started tracking consumers' location and movement patterns in recent years. This type of tracking can allow firms to predict consumers' future behaviors better and send targeted communications. However, such tracking also raises privacy concerns among app users and regulators. This results in potential trade-offs between the value of granular tracking and privacy concerns. This paper examines three related questions. First, we examine whether granular tracking data add value when predicting consumers' retail visits relative to traditional metrics. Second, we examine whether the granularity (e.g., frequency) with which these data are tracked impacts the accuracy with which we can predict future retail visits. Finally, we examine if there is heterogeneity in the value of granularity by firm type. Our results show that the accuracy of prediction algorithms improves by 21% with granular tracking data relative to models that use only demographic and behavioral information on past visits. However, when tracking data are collected at longer intervals, the performance of machine learning algorithms decreases, though they still outperform models that use only information on demographics and past behavior. We also find that a deep learning transformer model that uses the entire sequence of latitude-longitude coordinate pairs as input outperforms the ML models by 19% in accuracy but is more computationally expensive. Our models perform significantly better with more (vs. less) granular data for non-chain rather than chain restaurants. Finally, we show how our model may be used to evaluate targeting policies. This is a [joint work](#) with Unnati Narang at UIUC.

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**Date:** Monday, November 28, 2022

**Time:** 2:00 – 3:00 p.m. US Central Time

**Location:** **Blocker 220** (in person)

**Online:** 998 4499 3279 (ID) & 724615 (PWD)

**Faculty host:** Yu Ding, TAMIDS

### Biography

Dr. Fernando Luco is Associate Professor of Economics at Texas A&M University. Dr. Luco teaches graduate and undergraduate courses in Industrial Organization and Antitrust. In his courses, he teaches both methodological approaches to examine competitive and strategic firm conduct, as well as tools to quantify the impact of government policies on market outcomes. Dr. Luco's research focuses on topics in Industrial Organization and Antitrust. His research has been funded by the National Science Foundation, and it has been published in leading economic journals such as the American Economic Review and American Economic Journal: Microeconomics. Dr. Luco received his Ph.D. in Economics from Northwestern University in 2014.

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)