

NYU Stern School of Business
Department of Information, Operations & Management Sciences
IOMS Colloquium Series

TOPIC: A Bayesian Model for Assignment of Anonymous Customer Visits

SPEAKER: Eric Bradlow (Wharton, University of Pennsylvania)

DATE: Wednesday, November 19, 2014

TIME: 12:30 PM – 1:45PM

PLACE: KMC 3-110

ABSTRACT

Tailoring content to consumers has become a hallmark of marketing and digital media, particularly as it has become easier to identify customers across usage or purchase occasions (through many technologies including loyalty card programs, digital media, and mobile devices). However, across a wide variety of contexts, companies find that customers do not consistently identify themselves, leaving a substantial fraction of anonymous visits. We introduce here a method for companies to better account for anonymous visits in order to improve their targeted marketing.

Specifically, we develop a mathematical model that allows us to probabilistically assign anonymous sessions to users. The model can be used by companies to increase precision of targeted advertisements, product offerings, and other content to customers both with and without direct identification, resulting in improved decision-making and subsequent revenue. Our method can also be used to estimate the total number of unique customers, providing the company with a more accurate valuation of their customer base.

Our model is implemented by treating the unobserved user ID for each anonymous visit as missing data and sampling over its posterior distribution using MCMC methods. Our work also builds upon recent research that utilizes (via imputation) partially observed demographic information that allows for their use in other distance-based matching schemes. In particular, our model allows for both user ID and covariate missingness, making it more practical as it is unlikely if you can't identify the user that you would know his/her covariate profile.

BIO:

Professor Eric T. Bradlow is the K.P. Chao Professor, Professor of Marketing, Statistics and Education, Vice-Dean and Director of Wharton Doctoral Programs, and Co-Director of the Wharton Customer Analytics Initiative. An applied statistician, Professor Bradlow uses high-powered statistical models to solve problems on everything from Internet search engines to product assortment issues. Specifically, his research interests include Bayesian modeling, statistical computing, and developing new methodology for unique data structures with application to business problems.

Eric was recently named a fellow of the American Statistical Association, American Educational Research Association, is past chair of the American Statistical Association Section on Statistics in Marketing, past Editor-in-Chief of Marketing Science, is a past statistical fellow of Bell Labs,

and worked at DuPont Corporation's Corporate Marketing and Business Research Division and the Educational Testing Service.

A prolific scholar, Professor Bradlow 's research has been published in top-tier academic journals such as the *Journal of the American Statistical Association*, *Psychometrika*, *Statistica Sinica*, *Chance*, *Marketing Science*, *Management Science*, and *Journal of Marketing Research*. He also serves as Associate Editor for the *Journal of the American Statistical Association* and the *Journal of Marketing Research*, and is on the Editorial Boards of *Marketing Letters*, *Marketing Science*, *Journal of Marketing Research*, *Quantitative Marketing and Economics*, and the *Quarterly Journal of Electronic Commerce*.

Professor Bradlow has won numerous teaching awards at Wharton, including the MBA Core Curriculum teaching award, the Miller-Sherrerd MBA Core Teaching award and the Excellence in Teaching Award. His teaching interests include courses in Statistics, Marketing Research, Marketing Management and PhD Data Analysis, as well as any material related to customer analytics.

Professor Bradlow earned his PhD and Master's degrees in Mathematical Statistics from Harvard University and his BS in Economics from the University of Pennsylvania.