DO&IT Business Analytics and Big Data Tenure-Track Faculty Search
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Speaker: Courtney Paulson, University of Southern California

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Optimal Large-Scale Internet Media Selection

Author(s): Courtney Paulson (USC Marshall, Data Sciences and Operations), Lan Luo (USC Marshall, Marketing), and Gareth James (USC Marshall, Data Sciences and Operations)

Abstract: Although Internet advertising is vital in today’s business world, research on optimal Internet media selection has been sparse. Firms face considerable challenges in their budget allocation decisions, including the large number of websites they may potentially choose, the vast variation in traffic and costs across websites, and the inevitable correlations in viewership among these sites. Due to these unique features, Internet advertising problems are actually a subset of a more diverse, general class of problems: penalized and constrained optimization. Generally, attempting to select the optimal subset of websites among all possible combinations is a NP-hard problem; as such, existing non-penalized approaches can only handle Internet media selection in settings on the order of ten websites. Further, these approaches are not generalizable. Although generalizable penalized methodology exists to handle large-scale problems, this methodology cannot incorporate natural advertising constraints, such as budget allocation to particular websites or demographic weighting. We propose an optimization method that is computationally feasible to allocate advertising budgets among thousands of websites while also incorporating these common constraints. The method performs similarly to extant approaches in settings scalable to prior methods, but the method is also flexible enough to accommodate practical Internet advertising considerations such as targeted consumer demographics, mandatory media coverage to matched content websites, and target frequency of ad exposure.

Bio: Courtney Paulson is a statistics PhD Candidate in the Department of Data Sciences and Operations at the University of Southern California's Marshall School of Business. Her research primarily focuses on the application of statistical optimization to areas such as marketing, operations, and systems engineering. Her dissertation concerns large-scale Internet advertising campaign optimization, for which she was recently honored with the INFORMS Society of Marketing Science (ISMS) Doctoral Dissertation Award. In addition, she has also been the
recipient of travel grants to present at both the Joint Statistical Meetings and INFORMS conferences, as well as recently winning the USC Award for Excellence in Teaching.