

The Hong Kong University of Science and Technology
Dept of Information Systems, Business Statistics
and Operations Management
Dept of Industrial Engineering & Decision Analytics
Joint Seminar Announcement



Incentive-Compatible Assortment Optimization
by

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**Technology and Operations Management
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Abstract: Online marketplaces, such as Amazon, Alibaba, or Google Shopping, allow sellers to promote their products by charging them for the right to be displayed on top of organic search results. In this paper, we study the problem of designing auctions for promoted products and highlight some new challenges emerging from the interplay of two unique features: substitution effects and information asymmetry. The presence of substitution effects, which we capture by assuming that consumers choose sellers according to a multinomial logit model, implies that the probability a seller is chosen depends on the assortment of sellers displayed alongside. Additionally, sellers may hold private information about how their own products match consumers' interests, which the platform can elicit to make better assortment decisions. We first show that the first-best allocation, i.e., the welfare-maximizing assortment in the absence of private information, cannot be implemented truthfully in general. Thus motivated, we initiate the study of incentive-compatible assortment optimization by characterizing prior-free and prior-dependent mechanisms, and quantifying the worst-case social cost of implementing truthful assortment mechanisms. An important finding is that the worst-case social cost of implementing truthful mechanisms can be high when the number of sellers is large. Structurally, we show that optimal mechanisms may need to downward distort the efficient allocation both at the top and the bottom. This is joint work with Santiago Balseiro.

Bio: Dr Antoine Désir is an Assistant Professor of Technology and Operations Management at INSEAD. His research applies mathematical modeling and analytics to operations management problems with an aim to: (1) quantify fundamental tradeoffs, and (2) design efficient data-driven algorithms to support operational decisions. More precisely, Dr Désir focuses on revenue management and choice modeling with applications such as online advertising. He was an MSOM student paper finalist in 2014 and 2017 and a Nicholson student paper finalist in 2014 and 2015. He spent a year as a post-doctoral researcher at Google NYC.

All interested are welcome!
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