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Mitigating Choice Model Ambiguity: The Case of Assortment Optimization

By Zoom: <https://uqam.zoom.us/j/85322221977>

Abstract: In this study, we propose a novel framework to tackle the ambiguity associated with a given set of predictive models in terms of their ability to yield optimal decisions. The ambiguity of interest here arises from the differences between estimated predictive models, which is a natural consequence of employing statistical estimation methods. These differences remain, even when predictive models are trained under the same training data and to the same level of accuracy. To combat the consequences of choice model ambiguity, we first provide a framework that utilizes metrics to identify predictive models that perform well in terms of their ability to induce better decisions. Secondly, we introduce stochastic and robust optimization problems that employ an uncertainty set structure to hedge the risk of using predictive models that perform relatively poorer. To further motivate and demonstrate the use of this framework, we provide a detailed implementation of the framework on assortment optimization problems, where the objective is to choose an optimal set of products to be offered to customers, such that the expected revenue generated from the total sales is maximized. Since these problems rely on the use of predictive models (i.e. choice models) that represent customer behavior, handling choice model ambiguity in such problems becomes a crucial task in order to obtain accurate and optimal decisions.

Bio: Öykü Naz Attila is a postdoctoral researcher at ESG-UQAM. Her research interests mainly involve mixed-integer programming, optimization models under uncertainty, and framework development for handling uncertainty in specific applied optimization problems.

JEUDI / THURSDAY

7 avril/April 2022, 11h30

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Janosch Ortmann