

Title: Automatic Discovery and Generation of Visual Design Characteristics: Application to Visual Conjoint

Speaker: Vineet Kumar, Yale School of Management

Area: DS/Mktg

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Abstract:

Visual design characteristics of products play an important role in consumer preferences for many categories. However, characterization of quantification of visual design is a challenging problem. We provide a method to automatically discover and quantify visual characteristics (attributes) from image data using a disentanglement-based approach. While the deep learning literature has shown that supervision is required to obtain unique disentangled representations, ground truth visual characteristics are typically unknown in real world applications. Our method does not require such supervision, and instead uses readily available structured product characteristics as supervisory signals to enable disentanglement. No prior knowledge on design characteristics is required, yet we are able to discover human interpretable and statistically independent characteristics. We apply this method to automatically discover visual product characteristics of watches and discover 6 human interpretable visual characteristics providing a disentangled representation. We conduct visual conjoint analysis to obtain consumer preferences over visual characteristics. Our generative method is also able to create novel visual designs that correspond to ideal points of different consumer segments.

Speaker Profile:



Vineet Kumar is a faculty member at Yale School of Management, and an expert on Digital Technologies and Artificial Intelligence. His focus areas include machine learning using large scale data analytics (big data), digital products and services and networks. He studies how artificial intelligence and other digital technologies can allow us to better understand and create value drivers for firms, customers as

well as policy makers.

His interests include the following specific topics: (a) economic benefits of AI / ML, (b) fairness and bias in ML, (c) digital transformation of companies, (d) digital business models and platforms, including product strategy and technological innovation. His work has been published in top academic journals, and has been featured in national and international media.

At Yale, he teaches the core MBA Customer class and advanced MBA electives on **Digital Strategy** and **AI: Strategy + Marketing**. At the doctoral level, he has taught a variety of specialized courses. Vineet has also developed specialized executive programs for industry participants. He has undertaken engagements with a variety of companies on digital and technology strategies, including GE, American Express, *The New York Times*, Microsoft, UL and a number of startup firms.

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