Title
Theoretical and Computational Advances in Principled Preference Aggregation

Abstract
Over the last two decades, there has been a growing interest in the aggregation of individual preferences (i.e., rankings, ratings, etc.) into socially desirable choices, helping to propel the new interdisciplinary field of computational social choice. Advancements in this field are said to provide a counterbalance against "black box" decision-making technologies, and they have led to improved outcomes in business, technology, and various other domains. Yet, real-world implementation of the more principled methodologies—in the sense that their outputs guarantee desirable socio-theoretical properties—remains severely limited due to a combination of incompatible assumptions and computational difficulties.

This talk will discuss recent work that melds insights from social choice theory and multiple mathematical disciplines to scale the applicability of principled aggregation methods for modern contexts, specifically, for ranking data that is high-dimensional and contains ties. The presented contributions include new optimization models, voting properties, discrete algorithms, and polyhedral insights. Computational results on synthetic and real-world data extracted from various applications are also discussed.
Adolfo R. Escobedo received his Mathematics B.A. from California State University Los Angeles in 2009 and his Industrial and Systems Engineering Ph.D. from Texas A&M University in 2016. Prior to joining NC State, he was an assistant professor in the Industrial Engineering program of the School of Computing and Augmented Intelligence at Arizona State University. Escobedo’s research centers on the development of operations research and computational methods and is driven by modern societal challenges. His active areas of research include computational social choice, crowdsourcing, sustainable infrastructure development, circular economy, and computational linear algebra.

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