

Michigan Math Club

Thursday at 4pm in the Nesbitt Room
Free Pizza and Pop

Choosing under uncertainty

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Abstract for 10 April

Can we find a mathematical description of the process of decision making? Any decision corresponds to having an *order* (i.e., a comparison rule) on the space of possible outcomes. In many real-world problems, the outcome of a decision may include randomness: i.e., one chooses between various probability distributions, or, lotteries. In order to deduce one's decision-making rule from his or her actions, it is important to have a canonical description of all orders on a space of random lotteries -- i.e., all preferences. The latter is the main subject of the Theory of Preferences, which lies in the intersection of Mathematics and Economics. In this talk, I will discuss the classical Von Neumann-Morgenstern approach to this problem. I will introduce the axioms of rationality and will provide an explicit representation of all preferences that are consistent with these axioms. I will then demonstrate the limitations of this result and discuss its extensions.

