Modeling human decision-making in combinatorial games.

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Decision-making tasks such as navigation, negotiation, writing a paper, career planning, playing competitive sports, and military strategy all involve long sequences of decisions with multiple options at each step, leading to a combinatorial explosion of the decision tree. To investigate how people make these decisions, we collected behavioural data from human subjects playing a variant of tic-tac-toe against each other. We built a model for this behaviour inspired by economic game theory and artificial intelligence: players use a set of features and weights to assign values to board positions, and mentally simulate a decision tree. We introduce variability through noisy value assignment, stochastic feature dropping, and a lapse rate. This model can be applied to any combinatorial game for which a reasonable set of features exists. In my talk, I will show that this model can explain human behaviour, and introduce a set of experiments we're currently performing to better understand people's decision-making and learning strategies in this game.