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Speaker: **Jason Hartline**

Title: **An End-to-end Argument in Mechanism Design
(Prior-independent Auctions for Budgeted Agents)**

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Abstract: This paper considers prior-independent mechanism design, namely identifying a single mechanism that has near optimal performance on every prior distribution. We show that mechanisms with truth-telling equilibria, a.k.a., revelation mechanisms, do not always give optimal prior-independent mechanisms and we define the revelation gap to quantify the non-optimality of revelation mechanisms. This study suggests that it is important to develop a theory for the design of non-revelation mechanisms. Our analysis focuses on single-item auctions for agents with budgets and the objectives of welfare and with a natural regularity assumption on the distribution. Our main results show that the all-pay auction (a non-revelation mechanism) is an optimal prior-independent approximation mechanism. The all-pay auction, however, is not a revelation mechanism. We prove that prior-independent approximation of best revelation mechanism is strictly worse than that of the all-pay auction. Thus, the revelation gap is at least a constant. Finally, we show that the clinching auction (a revelation mechanism) is a prior-independent $e \approx 2.714$ approximation. Thus the revelation gap is a constant. Many of our analyses extend to the revenue objective, position environments, and irregular distributions.

Link to the paper: <https://arxiv.org/abs/1804.01977>