

Seminario AGCO

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Título: The Two-Sided Game of Googol and Sample-Based Prophet Inequalities.

Dónde: <https://zoom.us/j/99855140240?pwd=S3VaRTJUM2RHWmI2MzFiYnI1aXlXQT09>

Cuándo: Miércoles 24 de Junio, 15:45.

Abstract: The secretary problem or the game of Googol are classic models for online selection problems that have received significant attention in the last five decades. In this paper, we consider a variant of the problem and explore its connections to data-driven online selection. Specifically, we are given n cards with arbitrary non-negative numbers written on both sides. The cards are randomly placed on n consecutive positions on a table, and for each card, the visible side is also selected at random. The player sees the visible side of all cards and wants to select the card with the maximum hidden value. To this end, the player flips the first card, sees its hidden value, and decides whether to pick it or drop it and continue with the next card.

We study algorithms for two natural objectives. In the first one, similar to the secretary problem, the player wants to maximize the probability of selecting the maximum hidden value. We show that this can be done with probability at least 0.45292. In the second objective, similar to the prophet inequality, the player wants to maximize the expectation of the selected hidden value. Here we show a guarantee of at least 0.63518 with respect to the expected maximum hidden value.

We apply our results to the prophet secretary problem with unknown distributions, but with access to a single sample from each distribution. In particular, our guarantee improves upon $1-1/e$ for this problem, which is the currently best known guarantee and only works for the i.i.d. prophet inequality with samples.