Computer Science Theory Seminar

**Battling Bandits: Exploiting Preference Feedback towards Efficient Information Aggregation**

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**Abstract:** Customer statistics collected in several real-world systems have reflected that users often prefer eliciting their liking for a given pair of items, say (A,B), in terms of relative queries like: "Do you prefer Item A over B?", rather than their absolute counterparts: "How much do you score items A and B on a scale of [0-10]?"

Drawing inspirations, in the search for a more effective feedback collection mechanism, this led to the famous formulation of Dueling Bandits (DB), which is a widely studied online learning framework for efficient information aggregation from relative / comparative feedback. However despite the novel objective, unfortunately, most of the existing DB techniques were limited only to simpler settings of finite decision spaces, and stochastic environments, which are unrealistic in practice.

In this talk, we will start with the basic problem formulations for DB and familiarize ourselves with some of the breakthrough results. Following this, will dive deep into a more practical framework of contextual dueling bandits (C-DB) where the goal of the learner is to make customized predictions based on the user contexts: We will see a new algorithmic approach that can efficiently achieve the optimal regret performance for this problem, resolving an open problem from Dudík et al. [COLT, 2015]. We will conclude the talk with some interesting open problems.

**Tuesday, October 18 at 1:00 PM in 636 SEO**