Discrete Mathematics and Computer Science Seminars
Department of Mathematical Sciences, Sharif University of Technology

How to get rich? Algorithms for Learning From Experts

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Abstract

The main topic of this talk is the learning-from-expert-advice framework. Our goal here is to be able to predict, as accurately as possible, a sequence of events in a situation when our only information about the future is coming from recommendations of a set of experts. The key feature (and difficulty) of this scenario is that most if not all of these experts (and thus their recommendations) might be unreliable or even adversarial. Therefore, even if one of them is consistently providing fairly accurate predictions, we need to be able to efficiently extract this advice from all the misleading recommendations that we are receiving.

To cope with this task, we will develop a family of algorithms based on so-called multiplicative weights update method. We will show that these algorithms allow us to achieve close-to-optimal regret minimization bounds. That is, provided the sequence of predictions is sufficiently long, our prediction performance will be close to the performance of the expert that was best in the hindsight. Finally, we will see that this algorithmic approach also applies to a certain natural generalization of the above model. T ideas we discuss here have wide-spread applications throughout Computer Science most notably, in Machine Learning, Optimization, and Game Theory.

Wednesday, **1 Dey 1395** (21 December 2016), **12:45-14:00**
Room **317,** Department of Mathematical Sciences