THE UNIVERSITY OF CHICAGO | DEPARTMENT OF STATISTICS

Statistics Colloquium

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"Learning Systems in Adaptive Environments. Theory, Algorithms and Design"

MONDAY, March 06, 2023, at 4:30 PM
Jones 303, 5747 S. Ellis Avenue
Refreshments before the seminar at 4:00 PM in Jones 304.

ABSTRACT

Recent years have seen great successes in the development of learning algorithms in static predictive and generative tasks, where the objective is to learn a model that performs well on a single test deployment and in applications with abundant data. Comparatively less success has been achieved in designing algorithms for deployment in adaptive scenarios where the data distribution may be influenced by the choices of the algorithm itself, the algorithm needs to adaptively learn from human feedback, or the nature of the environment is rapidly changing. These are some of the most important challenges in the development of ML driven solutions for technologies such as internet social systems, ML driven scientific experimentation, and robotics. To fully realize the potential of these technologies we will necessitate better ways of designing algorithms for adaptive learning.

In this talk I propose the following algorithm design considerations for adaptive environments 1) development of sample efficient and tractable algorithms, 2) generalization to unseen domains via effective knowledge transfer and 3) adaptive learning from human feedback. I will give an overview of my work along each of these axes and introduce a variety of open problems and research directions inspired by this conceptual framing.

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