WiOpt 2016 – Invited Talk

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Title:
From Prediction to Action: Data-driven Approach in Networking (DDN)

Abstract:
Driven by the desire for better user experience, enabled by improved data storage and processing, much recent work studies user experience prediction in cellular networks. In this work, moving beyond prediction, we utilize the learned prediction model to guide resource allocation to reduce the number of unsatisfied cellular users. The intuition is that the learned model, combined with domain knowledge, provides the best quantitative estimation between observed network performance metrics and user experience, and thus can more effectively guide network resource allocation. However, this method of allocating resources create a difficult non-convex optimization problem. In studying the dual of the optimization problem and characterizing its optimal solution based on the KKT conditions and separability properties, we propose efficient algorithms to obtain optimal/near-optimal solutions. Numerical results based on real network data traces demonstrate the effectiveness of the proposed algorithms.