# DATANET 2016

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**Title:**

From Prediction to Action: Data-driven QoE Provisioning

**Abstract:**

Driven by the desire for better user experience, and enabled by improved data storage and processing, much recent work studies user experience prediction in cellular networks. In this work, moving beyond prediction, we consider how to reduce the number of unsatisfied cellular users by utilizing the learned prediction model to guide resource allocation to reduce the number of unsatisfied cellular users. The key idea is that the learned model, combined with domain knowledge, provides important insights into the best quantitative relationship between observed network performance metrics and user experience, and thus can more effectively guide network resource allocation. However, this method of allocating resources creates a difficult non-convex optimization problem. After studying the dual of the optimization problem, and characterizing its optimal solution based on its the KKT conditions and separability properties, we propose efficient algorithms to obtain near-optimal solutions. The effectiveness of these algorithms is demonstrated by numerical results based on real network data.