THE UNIVERSITY OF CHICAGO | DEPARTMENT OF STATISTICS

PhD Dissertation Presentation

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"Scaling Up and Speeding Up Classical Optimization on Modern Computing Architectures"

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Abstract

The rapid advancement of modern computing architectures, particularly graphics processing units (GPUs), has fundamentally reshaped the landscape of large-scale computation. While machine learning has successfully leveraged these architectures through highly parallelizable first-order methods, classical optimization, such as linear and quadratic programming, remains largely dominated by CPU-based solvers built on factorization-intensive algorithms. This dissertation aims to bridge this gap by developing scalable, GPU-compatible optimization algorithms that exploit the structural advantages of first-order methods.

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