Computational Mathematics Colloquium

Optimization Methods for Training Neural Networks

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Abstract: Most high-dimensional nonconvex optimization problems cannot be solved to optimality. It has been observed, however, that deep neural networks have a benign geometry that permits standard optimization methods to find acceptable solutions. However, solution times can be exorbitant. In addition, not all minimizers of the neural network loss functions are equally desirable, as some lead to prediction systems with better generalization properties than others. In this talk we discuss classical and new optimization methods in the light of these observations, and conclude with some open questions.

BIO: Jorge Nocedal is the Walter P. Murphy Professor in the Department of Industrial Engineering and Management Sciences at Northwestern University. His research is in optimization, both deterministic and stochastic, and with emphasis on very large-scale problems. His current work is driven by applications in machine learning. He is a SIAM Fellow, was awarded the 2012 George B. Dantzig Prize, and the 2017 Von Neumann Theory Prize for contributions to theory and algorithms of optimization.

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Mathematics and Computer Science Emory University