Incremental Subgradient Methods for Convex Non-differentiable Optimization

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Abstract

This talk is focused on the dual methods for solving convex non-differentiable problems arising from Lagrangian duality. Subgradient methods are typically applied to such problems, since the classical gradient-based methods fail to converge. We present and discuss an incremental subgradient method applicable to convex problems when the objective function is the sum of a large number of component functions. Such convex problems arise in many applications, including scheduling, image reconstruction, and resource allocation. The incremental subgradient method exploits the special structure of the objective function, and it can be implemented with various stepsize choices and in various fashions including those with randomization, and with centralized and distributed computations. We discuss some of the convergence properties of a non-randomized and a randomized version of the method. We also discuss some of the convergence rate results for these methods.

Biography

Angelia Nedich received her B.S. degree from the University of Montenegro (1987) and M.S. degree from the University of Belgrade (1990), both in Mathematics. She received her Ph.D. degrees from Moscow State University (1994) in Mathematics and Mathematical Physics, and from Massachusetts Institute of Technology in Electrical Engineering and Computer Science (2002). From 2002 until recently, she had worked as a senior engineer at the BAE Systems Advanced Information Technology in Burlington, Massachusetts. There she had been developing and analyzing algorithms for automatic decision systems for sensor resource management. This year she joined the IESE Department at UIUC as an assistant professor. Dr. Nedich's general interests are in optimization theory, large scale decision systems, control theory, and their applications.