

DC Learning: Recent advances and ongoing developments

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Abstract

One of the challenges for the scientists at the present time consists of the optimal exploitation of a huge quantity of data of the information stored in various forms. The knowledge extraction from these data requires the use of sophisticated techniques and high performance algorithms based on solid theoretical foundations and statistics. Based on the powerful arsenal of convex analysis, DC (Difference on Convex functions) programming and DCA (DC Algorithms) are among the few nonconvex optimization approaches that can meet this requirement. Machine Learning represents a mine of optimization problems that are almost all DC programs for which appropriate resolutions should resort to DC programming and DCA. During the last two decades DC programming and DCA have been successfully developed for modeling and solving a lot of nonconvex programs in various areas of machine learning. They constitute the so called DC Learning (DCL) framework.

This talk presents recent developments on DCL. After a brief introduction to DC programming and DCA we give a review and analysis on the existing DCL methods. Next, we discuss recent advances and ongoing developments in DCL including DCL with sparsity and uncertainty, Online learning & Stochastic learning on Big data, etc.