Multiplicative weight method: A general algorithmic tool (with applications to linear and semidefinite programming)

Sanjeev Arora
arora@cs.princeton.edu
Department of Computer Science
Princeton University
35 Olden Street
Princeton, NJ $08544 - 2087$
USA

Abstract

Algorithms in a variety of disciplines use the idea of maintaining a distribution over a certain set and using the multiplicative weight update rule to update the distribution. Examples include approximation algorithms for packing-covering LPs, boosting in learning theory, portfolio management in finance, and the XOR lemma in cryptography. This talk surveys some of these applications, and describes new applications of such ideas to computing fast solutions to LPs and SDPs.