Online Discriminative Learning: Theory and Applications

Nicolò Cesa-Bianchi

DSI, Università degli Studi di Milano
via Comelico 39, 20135 Milano, Italy
cesa-bianchi@dsi.unimi.it

Abstract

Online discriminative learning has been successfully applied to various speech and natural language processing tasks, including classification, parsing, translation and speech recognition/generation. In addition to their simplicity and scalability, online learning algorithms are natural tools in applications involving human-computer interaction, such as computer-assisted translation. In this talk we describe some of the most popular online learning algorithms, and mention their connection with the solution of convex optimization problems. In order to cope with problems where the human feedback comes at a cost, we also illustrate some simple techniques for designing online algorithms that work in semi-supervised mode (active learning). We then discuss the game-theoretic nature of online performance analysis, which explains the robustness to noise exhibited by these algorithms. Finally, we mention some of the latest research developments and future challenges in the online research domain.