Refined Bounds for Online Pairwise Learning Algorithms

Xiaming Chen
City University of Hong Kong
xiamichen2-c@my.cityu.edu.hk

We consider an Online Pairwise lEaRning Algorithm (OPERA) in a reproducing kernel Hilbert space (RKHS) without an explicit regularization. We establish convergence rates which can be arbitrarily closed to $O(T^{-\frac{1}{2}})$ within T iterations, improving greatly the existing convergence rates for OPERA. Our novel analysis is conducted by showing the boundedness of the iterates encountered in the learning process with large probability after establishing an induction lemma on refining the RKHS norm estimate of the iterates.

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