SmoothRank on LETOR

Introduction to SmoothRank

SmoothRank is an algorithm which aims at directly optimizing popular measures such as the Normalized Discounted Cumulative Gain (NDCG) and the Average Precision (AP). The basic idea is to minimize a smooth approximation of these measures with gradient descent. Crucial to this kind of approach is the choice of the smoothing factor. An *annealing* algorithm is devised to iteratively minimize a less and less smoothed approximation of the measure of interest.

SmoothRank is described in details in this paper. Note that SoftRank is a similar algorithm.

Learning

The results reported aimed at optimizing NDCG. In particular, during training, a smoothed version of NDCG@50 was maximized and model selection was performed according to NDCG@50.

Papers & Docs

O. Chapelle and M. Wu. Gradient descent optimization of smoothed information retrieval metrics. Information Retrieval Journal, Special Issue on Learning to Rank, 2009. submitted.

Notes

This document was written by Olivier Chapelle, and the experiments were conducted by Olivier Chapelle. If any problem, please contact letor@microsoft.com or chap@yahoo-inc.com