

Accelerated algorithms for
maximizing average happiness ratio
in databases

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Problems & Ideas

- Problems: Existing algorithms for the k-average-regret query are generally very time-consuming.
- Ideas: Propose k-average-happiness query and prove k-average-happiness ratio function is a monotone nonnegative and nondecreasing submodular function.

$$ahr_D(S, U) = \sum_{u \in U} hr_D(S, u) Pr(u)$$

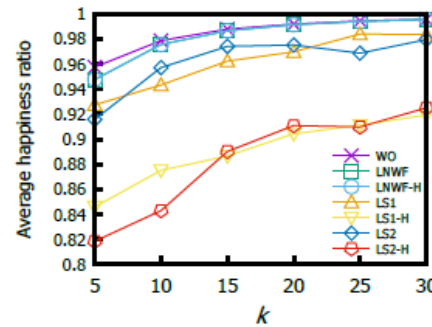
Transfer the function evaluation on a small dataset $S_{i-1} \cup \{p\}$ instead of the whole dataset D

$$ahr_D(S_{i-1}, U) = ahr_{S_{i-1} \cup \{p\}}(S_{i-1}, U)$$

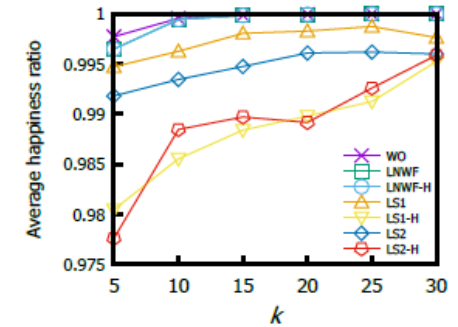
Propose two accelerated algorithms: Lazy NWF-Greedy and Lazy Stochastic-Greedy

Main Contributions

- Achieve almost the same average happiness ratio on the Anti-correlated and NBA datasets

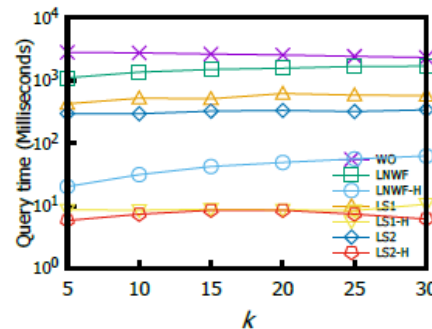


(a) Anti-correlated

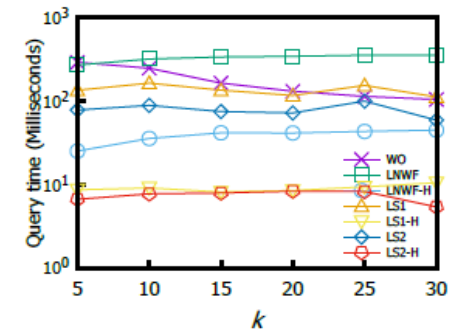


(b) NBA

- Need less CPU time compared with current state-of-the-art algorithms



(c) Anti-correlated



(d) NBA