Lightning Network

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Presentation Overview

1. Spectral Bandits
2. Combinatorial Bandits
3. Capacity Allocation
4. Maximum Betweenness Improvement

Spectral Bandits

- Spectral UCB
- reduction to Spectral Bandit with K-Cubes
  - exponential time
  - insensitive to topology
  - comparison with greedy algorithm in combinatorial bandits

Combinatorial Bandits

- $\alpha\beta$-approximation
  - what is μ ?
  - finding an Oracle
  - a paper on Arxiv seemed promising but their assumptions were unreasonable
- Greedy does not work

Capacity Allocation

- LP with bandit feedback
- Convex Optimization with Bandit feedback
  - proving convexity of our setting
  - proving the distribution being sub-gaussian
  - exponential dist. did not work so we proved for truncated gaussian

Maximum Betweenness Improvement

- NP-hard for any guarantee better than $1 - \frac{1}{2e}$
- greedy works for directed graphs
- greedy is arbitrarily far from optimal in undirected case
- solution with $\Omega(\frac{1}{\sqrt{n}})$ guarantee
- solving MBI with capacity considered
- reduction from weighted case to unweighted case