Dynamic matching in crowdsourcing platform

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Semester Project/Master Thesis
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1. Background and Introduction

   Crowdsourcing is new paradigm introduced in last decade for getting work done in the form of an open call over internet. Crowdsourcing platforms such as AMT, crowdflower enable micro tasks get done quickly. It has become very popular and it has become source of living for many workers in such crowdsourcing platforms.

   However, in this marketplace, requestors, and the ones who want tasks to be completed and pay workers, have preferences over workers based on its performance on particular task or over all performance, or demographics etc. Workers also prefer certain tasks more over others, are good at certain tasks even though they are not keen on those type of tasks.

   Currently workers are displayed tasks based on few selected criteria such as reward, no of tasks by the requestors, most recent first etc.
   Can crowdsourcing platform display tasks to workers more intelligently and efficiently, to cater to preferences of the requestors as well workers?

   There are interesting challenges in real implementations. The participating workers, requestors will be typically smart and manipulate the system to report their preferences. One can leverage techniques from Matching theory in this context for matching tasks and workers. However, in this setting, both sides of market are dynamic. This leads more interesting challenges. [1] addresses the dynamic matching achieving stability at the cost of substitutes. However, the substitutes need not be available always. The goal in this project is to improve on techniques proposed in [1] either to improve rank-efficiency of the matching or reduce the substitutes used by [1].

2. Tasks
   In this project, we intend to develop dynamic matching theory and implement
   We need to study various matching algorithms and how they perform, or how the

workers-requestors satisfaction level changes.

Goal 1:
Study and analysis of dynamic matching algorithm when one side of the market is dynamic.
Improve on existing algorithms and implement.

Goal 2:
Design of matching algorithms for matching workers and tasks when both sides are dynamic. The algorithm should satisfy nice game theoretic properties such stability, incentive compatibility. Test its performance over crowdsourcing platforms.

Stretch Goal:
Design an optimal algorithm for the dynamic matching, deploy it over crowdsourcing platform.

3. Pre-requisite

   ✓ Preliminary knowledge of Game Theory
   ✓ Good Matlab Programming skills.

4. Reference:

[1] Gujar, Sujit, and David C. Parkes. "Dynamic Matching with a Fall-back Option." In *ECAI*, pp. 263-268. 2010.