WEB BASED APPLICATION FOR MULTISPATIAL CROWD SOURCING

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ABSTRACT

With the rapid development of mobile devices and crowdsourcing platforms, the spatial crowdsourcing has attractedmuch attention from the database community. Specifically, the spatial crowdsourcing refers to sending location-based requests to workers, based on their current positions. In this paper, we consider a spatial crowdsourcing scenario, in which each worker has a set of qualified skills, whereas each spatial task (e.g., repairing a house, decorating a room, and performing entertainment shows for a ceremony) is time-constrained, under the budget constraint, and required a set of skills. Under this scenario, we will study an important problem, namely multi-skillspatial crowdsourcing (MS-SC), which finds an optimal workerand- task assignment strategy, such that skills between workers and tasks match with each other, and workers' benefits are maximized under the budget constraint. We prove that the MSSC problem is NP-hard and intractable. Therefore, we propose three effective heuristic approaches, including greedy, g-divideand- conquer and cost-model-based adaptive algorithms to get worker-and-task assignments. Through extensive experiments, we demonstrate the efficiency and effectiveness of our MS-SCprocessing approaches on both real and synthetic data sets.

I. INTRODUCTION

BACKGROUND

Nowadays people can easily identify and participate in some locations that are close to their current positions, such as repairing houses, and/or preparing for parties at some locations. A framework called spatial crowdsourcing for employing workers to conduct spatial tasks, has emerged in both academia and industry .A typical spatial crowd sourcing platform assigns a number of moving workers to do spatial tasks nearby, which requires workers to physically move to some specified locations and accomplish these tasks. In contrast, some spatial tasks can be rather complex, such as repairing a house which may consist of several steps/phases/aspects, and require demanding professional skills from workers. These complex tasks cannot be simply accomplished by normal workers, but require the skilled workers with specific expertise a multi skill spatial crowd sourcing (MS-SC), which finds an optimal worker-and-task assignment strategy, such that skills between workers and tasks match with each other, and workers' benefits are maximized under the budget constraint.

The spatial crowdsourcing refers to sending location-based requests to workers, based on their current positions. In this paper, we consider a general spatial crowdsourcing problem, namely multi-skill spatial crowdsourcing in which spatial tasks (such as holding a barbecue party, decorating a room, house maintenance and performing entertainment shows for a ceremony) are time-constrained and featured with sets of required skills under the specified budget constraints, and workers have different skills and expertise, constrained by maximum traveling distances. With the rapid development of mobile devices and crowdsourcing platforms, the spatial crowdsourcing has attracted much attention from the database community. Specifically, the spatial crowdsourcing refers to sending location-based requests to workers, based on their current positions. In this paper, we consider a general spatial crowdsourcing problem, namely multi-skill spatial crowdsourcing (MS-SC), in which spatial tasks (such as holding a barbecue party, decorating a room, house maintenance and performing entertainment shows for a ceremony) are time-constrained and featured with sets of required skills under the specified budget constraints, and workers have different skills and expertise, constrained by maximum traveling distances.

MOTIVATION

Our MS-SC problem is to find an optimal task-work assignment which can minimize the payment to workers while maximize the number of assigned tasks. We prove that the MS-SC problem is NP-hard and intractable. Therefore, we propose three effective heuristic approaches, including greedy, g-divide-and-conquer, and cost-model-based adaptive algorithms. Through extensive experiments, we demonstrate the efficiency and effectiveness of our proposed approaches over both real and synthetic data sets.The skills will be segregated into different categories, based on the different set of skills known byone person stillness. This will make it easier to serve the end-user based on the budget. The segregation in the database will sort and make it easier for end users to search and choose the best asset to accomplish their work. As the workers are segregated on the degree of their skill, it makes it much easier to find the right job for right skill based worker.

AIM

In the proposed research work we develop 'Web Based application on multi-skilled spatial crowdsourcing' .This application will be very helpful for different kind of work to be get done in a minimum time,cost and also it will inprove the quality of work.We can also form a perfect team of skilled worker for doing a particular work or task. This web base application is been developed to get the skilled worker in a minimum time and also at minimum distance nearby.

- A one stop solution for all handy-man works.
- To identify and deerive the best asset to serve the end-user.
- A search system based on the set of skills of the service providers(Handy-Men).
- Proposing set of different categories for each class of service providers.
- Geo-location based selection of the workers when an enduser requests a service.
- Cost efficient services provided to the customer based on the degree of skill required to serve the End-User.

LITERATURE SURVEY

A framework for optimizing collaborative knowledge-intensive crowdsourcing. SmartCrowd distinguishes itself by accounting for human factors in the process of assigning tasks to workers. Human factors designate workers' expertise in different skills, their expected minimum wage, and their availability. In SmartCrowd, we formulate task assignment as an optimization problem, and rely on pre-indexing workers and maintaining the indexes adaptively, in such a way that the task assignment process gets optimized both qualitatively, and computation time-wise. We present rigorous theoretical analyses of the optimization problem and propose optimal and approximation algorithms. [1]

Crowdsourcing systems, in which numerous tasks are electronically distributed to numerous "information piece-workers", have emerged as an effective paradigm for human-powered solving of large scale problems in domains such as image classification, data entry, optical character recognition, recommendation, and proofreading. [2]

Crowdsourcing, has been widely used for many human intrinsic tasks, such as image labeling, natural language understanding, market predication and opinion mining. Meanwhile, with advances in pervasive technology, mobile devices, such as mobile phones and tablets, have become extremely popular. These mobile devices can work as sensors to collect multimedia data (audios, images and videos) and location information. This power makes it possible to implement the new crowdsourcing mode: spatial crowdsourcing. [3]

Reliable Diversity-Based Spatial Crowdsourcing by Moving Workers: In spatial crowdsourcing, a requester can ask for resources related a specific location; the mobile users who would like to take the task will travel to that place and get the data. Due to the rapid growth of mobile device uses, spatial crowdsourcing is likely to become more popular than general crowdsourcing, such as Amazon Turk and Crowd flower. [4]

In this paper, we study a novel spatial crowdsourcing system where the workers' time availabilities and their spatial locations are known a priori. Consequently, the tasks assignment to workers is performed not only based on the current location of the human workers and the tasks available in the region, but also based on the availability of the workers during the specific times that a given task should be accepted, processed, and completed. [5]

II. ALGORITHM USED

Pro_Greedycedure MS-SC

Input: n workers in Wp and m time-constrained spatial tasks in Tp.

Output: a worker and task assignment instance set, Ip

1. Ip =ϕ
2. Compute all valid worker and task pairs (wi, tj) from Wp and Tp
3. While Wp ≠ ϕ and Tp ≠ ϕ
4. Scand = ϕ;
5. For each task tj ϵ Tp
6. for each worker wi in the valid pair (wi, tj)
7. if we cannot prune dominated worker wi by Lemma 2
8. if we cannot prune high – wage worker wi by Lemma 3
9. add (wi, tj) to Scand
10. if we cannot prune the task tj w.r.t. workers in Scand by Lemma 4
11. for each pair w.r.t. task tj in Scand
12. compute the score increase, ΔSp(wi, tj)
13. else

14. Tp = Tp- { tj }

15. Obtain a pair, (wr, tj) ϵ Scand ,with the highest score increase,ΔSp(wr, tj) , and add this pair to Ip

16. Wp = Wp – {wr}

17. Return Ip }

Divide-and-conquer algorithm

In this algorithm it recursively divides the original problem into sub problems and gives solution to each sub problem and then merge that solution by resolving conflicts. The algorithm is as shown below:

Procedure MS-SC_gD&C

Input: n workers in Wp and m time-constrained spatial tasks in Tp

Output: a worker and task assignment instance set, Ip

1. Ip=ϕ
2. Estimate the best number of groups , g, for Wp and Tp
3. invoke MS-SC_Decomposition (Wp,Tp,g) and obtain subproblems Ps
4. for s = 1 to g
5. if the number of tasks in subproblem Ps (group size) is greater than 1
6. Ip (*) = MS-SC_gD&C (Wp(Ps),Tp(Ps))
7. else
8. invoke classical greedy set cover algorithm to solve subproblem Ps and obtain assignment results Ip (*)
9. for i= 1 to g
10. find the next subproblem, Ps
11. Ip = MS-SC_Conflict_Reconcile (Ip, Ip (*)) 12. Return Ip }

Procedure MS-SC_Adaptive

Input: n workers in Wp and m time-constrained spatial tasks in Tp

Output: a worker and task assignment instance set, Ip

1. Ip=ϕ
2. estimate the cost, costgreedy,of the greedy algorithm
3. estimate the best number of groups,g, and obtain the cost ,cost gdc,of the g-D&C approach
4. ifcostgreedy<costgdc
5. Ip =MS-SC_Greedy(Wp,Tp)
6. else // g-D&C algorithm
7. invoke MS-SC_Decomposition (Wp,Tp,g) and obtain the subproblems Ps
8. for each subproblem, Ps
9. Ip (*) = MS-SC_Adaptive (Wp(Ps),Tp(Ps))
10. For i=1 to g
11. Find the next subproblem,Ps

12. Ip =MS-SC_Conflict_Reconcile (Ip, Ip (*))

13. Return Ip

III. SYSTEM ANALYSIS PROPOSED ARCHITECTURE

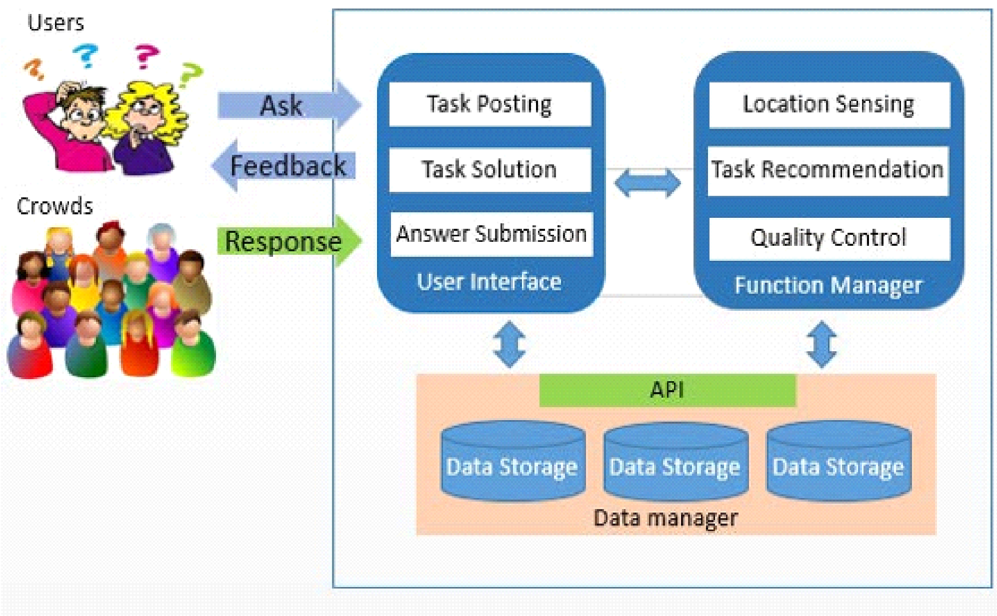

Fig 01: System Architecture

Explanation-

With the rapid development of mobile devices and crowdsourcing platforms, the spatial crowdsourcing has attracted much attention from the database community. Specifically, the spatial crowdsourcing refers to sending location-based requests to workers, based on their current positions. In this paper, we consider a spatial crowdsourcing scenario, in which each worker has a set of qualified skills, whereas each spatial task (e.g., repairing a house, decorating a room, and performing entertainment shows for a ceremony) is time-constrained, under the budget constraint, and required a set of skills. Under this scenario, we will study an important problem, namely multi-skill spatial crowdsourcing (MS-SC), which finds an optimal worker-and-task assignment strategy, such that skills between workers and tasks match with each other, and workers' benefits are maximized under the budget constraint. We prove that the MS-SC problem is NP-hard and intractable. Therefore, we propose three effective heuristic approaches, including greedy, g-divide-and-conquer and cost-model-based adaptive algorithms to get worker-and-task assignments. Through extensive experiments, we demonstrate the efficiency and effectiveness of our MS-SC processing approaches on both real and synthetic data sets.

IV. CONCLUSION

We propose the problem of the multi-skill oriented spatial crowdsourcing (MS-SC), which assigns thetime-constrained and multi-skill-required spatial tasks withdynamically moving workers, such that the required skills oftasks can be covered by skills of workers and the assignmentscore is maximized. We prove that the processing of the MSSCproblem is NP-hard, and thus we propose three approximationapproaches (i.e., greedy, g-D&C, and cost-model-basedadaptive algorithms), which can efficiently retrieve MS-SC answers. Extensive experiments have shown the efficiency andeffectiveness of our proposed MS-SC approaches on both realand synthetic data sets.

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