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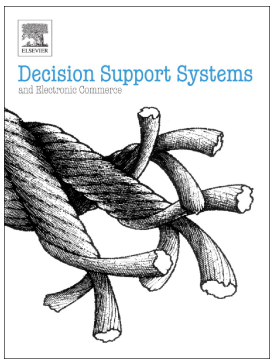

Toward a real-time and budget-aware task package allocation in spatial crowdsourcing

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Toward a real-time and budget-aware task package allocation in spatial crowdsourcing

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Abstract: With the development of mobile technology, spatial crowdsourcing has become a popular approach in collecting data or road information. However, as the number of spatial crowdsourcing tasks becomes increasingly large, the accurate and rapid allocation of tasks to suitable workers has become a major challenge in managing spatial outsourcing. Existing studies have explored the task allocation algorithms with the aim of guaranteeing quality information from workers. However, studies focusing on the task allocation rate when allocating tasks are still lacking despite the increasing unallocated rates of spatial crowdsourcing tasks in the real world. Although the task package is a commonly known scheme used to allocate tasks, it has not been applied to allocate spatial crowdsourcing tasks. To fill these gaps in the literature, we propose a real-time, budget-aware task package allocation for spatial crowdsourcing (RB-TPSC) with the dual objectives of improving the task allocation rate and maximizing the expected quality of results from workers under limited budgets. The proposed RB-TPSC enables spatial crowdsourcing task requester to automatically make key task allocation decisions on the following: (1) to whom should the task be allocated, (2) how much should the reward be for the task, and (3) whether and how the task is packaged with other tasks.

Keywords: Spatial crowdsourcing; Task allocation algorithm; Task package; Incentive mechanism; Greedy algorithm; Reputation

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