

FAKULTÄT FÜR MATHEMATIK, INFORMATIK UND STATISTIK INSTITUT FÜR INFORMATIK

LEHR UND FORSCHUNGSEINHEIT FÜR DATENBANKSYSTEME





WE CROWDSOURCE THE DESIGN
PROCESS, ALLOWING THOSE WITH
THE BEST DESIGNS TO CONNECT—
VIA ALREADY-IN-PLACE SOCIAL
NETWORKING INFRASTRUCTURE—
WITH INTERESTED MANUFACTURERS,
DISTRIBUTORS, AND MARKETERS.

NOBODY CAUGHT ON THAT OUR BUSINESS PLAN DIDN'T INVOLVE US IN ANY WAY— IT WAS JUST A DESCRIPTION OF OTHER PEOPLE MAKING AND SELLING PRODUCTS. Kazemi & Shahabi:

GeoCrowd: Enabling Query
Answering with Spatial
Crowdsourcing

Seminar MediaQ Basaran, Kinshofer, Sauer 08.12.14

Source: xkcd.com







Taxonomy of Spatial Crowdsourcing

- Spatial Crowdsourcing Classification
 - Reward-based vs Self-incentivised
- Spatial Task Publishing Modes
 Worker Selected vs Server Assigned
- Spatial Task Assignment Modes
 Single Task Assignment vs Redundant Task Assignment



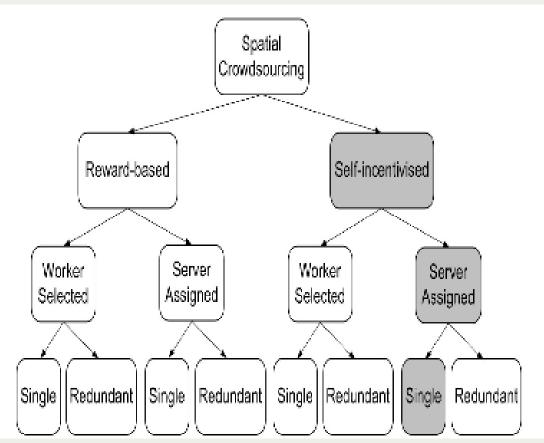
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Taxonomy of Spatial Crowdsourcing



Quelle: Kazemi, L. & Shahabi, C.: GeoCrowd: Enabling Query Answering with Spatial Crowdsourcing



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MTA-Problem

Maximum Task Assignment:

Maximize **number of assigned Tasks** during time T, where Tasks are assigned at times $t \in T$

Worker:

max. number of tasks max and region R in which he travels



MTA-Problem

Greedy-Strategy:

Solve MTA-Problem **locally** for every instance of time

Reduction to Maximum Flow Problem



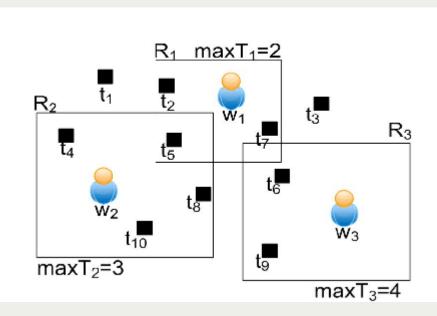
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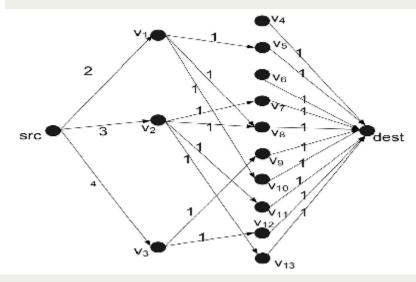


MTA-Problem



Tasks and Workers

Flow Network Graph



Quelle: Kazemi, L. & Shahabi, C.: GeoCrowd: Enabling Query Answering with Spatial Crowdsourcing



MTA Problem

Least Location Entropy Priority Strategy
 Higher priority to tasks in worker-sparse areas



MTA-Problem

Nearest Neighbor Priority

Assign tasks with **lowest travel costs** for every worker **(euklidean distance)**



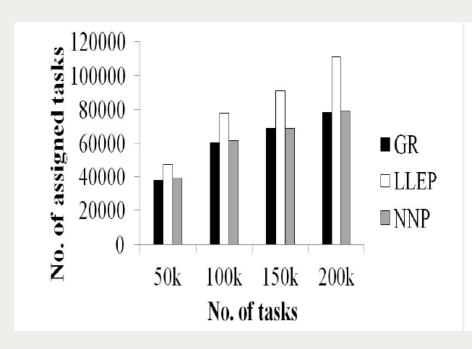
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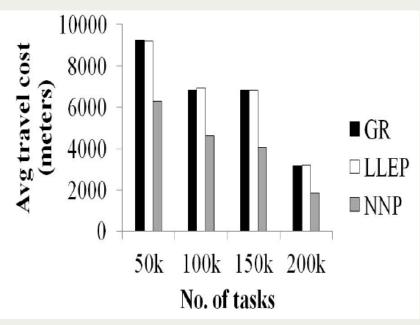
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Evaluation





Quelle: Kazemi, L. & Shahabi, C.: GeoCrowd: Enabling Query Answering with Spatial Crowdsourcing



Use Cases

- Student Orientation App:
 - Where are good Coffeeshops near LMU?
- Crime Scene Investigation:
 - Crime happened, upload all your videos
- Alternate Reality Gaming:
 - Citywide Räuber und Gendarm



Use Cases

Flashmobs

Proof for Scavenger Hunts





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References:

- Leyla Kazemi, Cyrus Shahabi. GeoCrowd: Enabling Query Answering with Spatial Crowdsourcing. In Proc. GIS (2012).
- Ford, Lester R., and Delbert R. Fulkerson. "Maximal flow through a network." *Canadian journal of Mathematics* 8.3 (1956): 399-404.