Incentive Mechanisms for Mobile Crowdsourcing, Reaching Spatial and Temporal Coverage Under Budget Constraints

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Goal: Developing an incentive mechanism for Crowdsensing that provides spatial and temporal coverage for a target area region under budget constraints

Challenges:

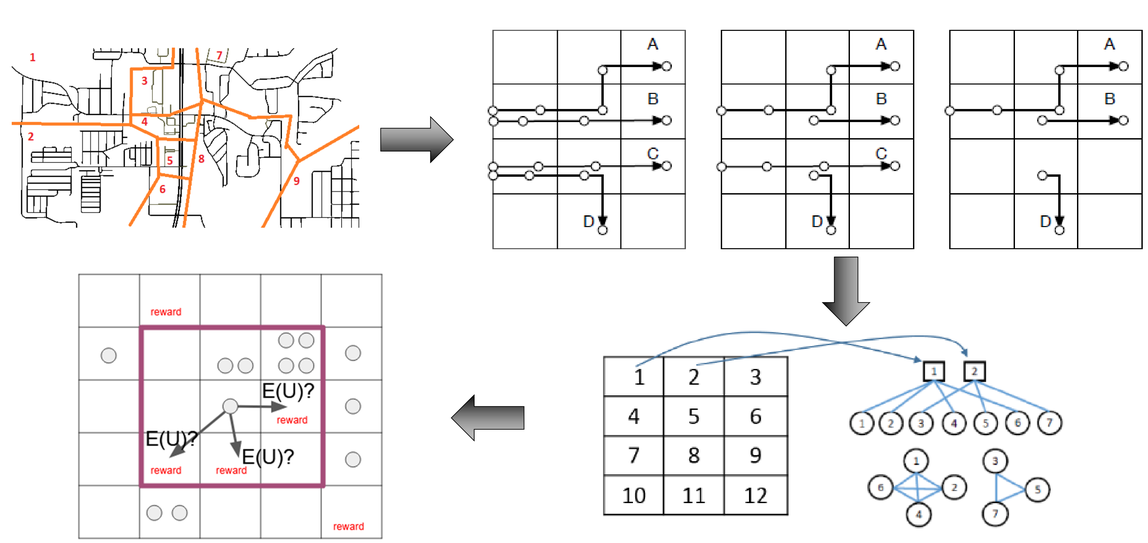
- Modify the participant trajectories to improve coverage
- Provide temporal sub-region monitoring
- Model a CS system with imperfect rationality

Scientific Impact:

- Creating a crowd sourced sensing market using game theory
- Improving autonomous vehicle navigation based on utility functions
- Relaxation of perfect rationality assumption for players to create realistic intelligent mobility models

Approach:

- The system persuades participants to modify trajectories and visit regions of interest by using incentive mechanisms
- A sensing market is modeled as a non-cooperative game where trajectories are the strategies
- Participants maximize their utilities by strategizing their sensing contribution
- Crowdsourcers maximize their utilities by predicting the contributors' behavior



Impact on Society

- Contributions to emerging trends in autonomous vehicles and logistics
- Improvement in data collection coverage
- Improvement of infrastructure utilization

Impact on Education and Outreach

- Exposure of students to computational modeling and experimentation
- Engaging multiple undergraduate students in research
- Adding new topics to Fl Poly curriculum

Potential Impact

- More than a 20% increase in coverage according to initial results
- Improvement in infrastructure utilization by 20%
- Creation of a crowdsensing market

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