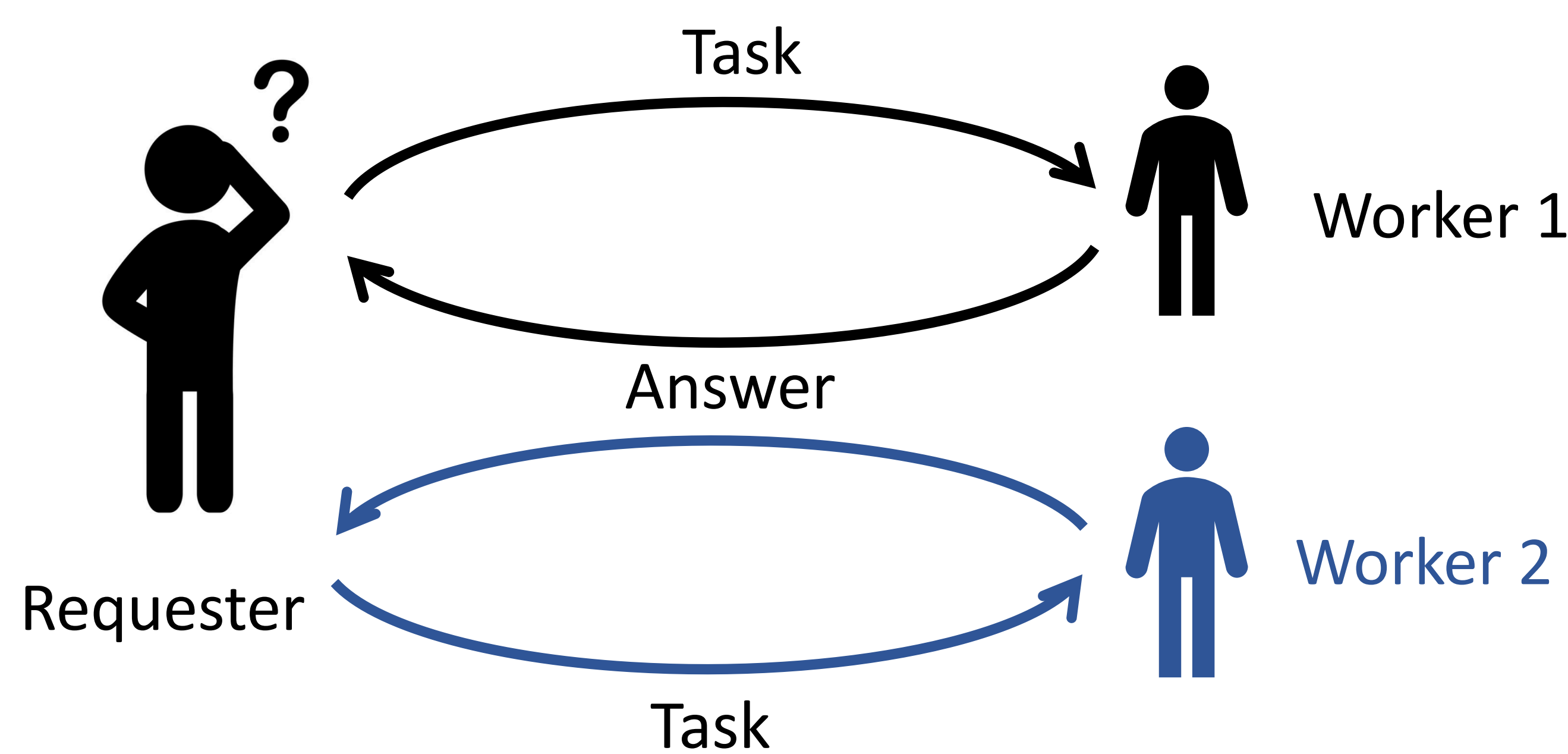


# Leveraging Peer Communication to Enhance Crowdsourcing

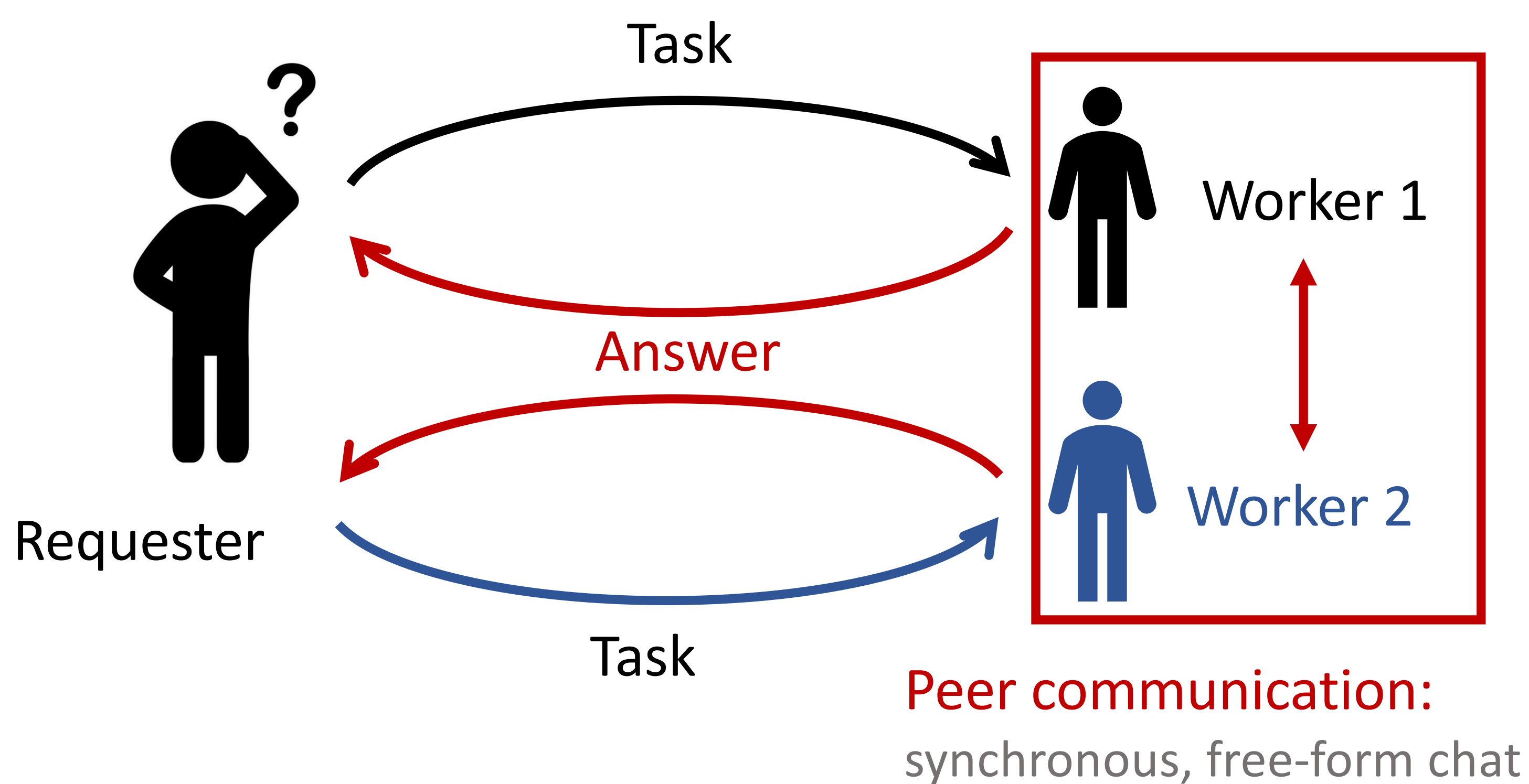
## Summary:

- We experimentally examine the effects of **peer communication** on crowdsourcing tasks. We show that the work quality is significantly improved if workers are allowed to work together.
- We algorithmically explore how to utilize peer communication to optimize the requester's total utility. We model it as **constrained Markov decision process** which maximizes the requester's total utility under budget constraints.

## Motivation



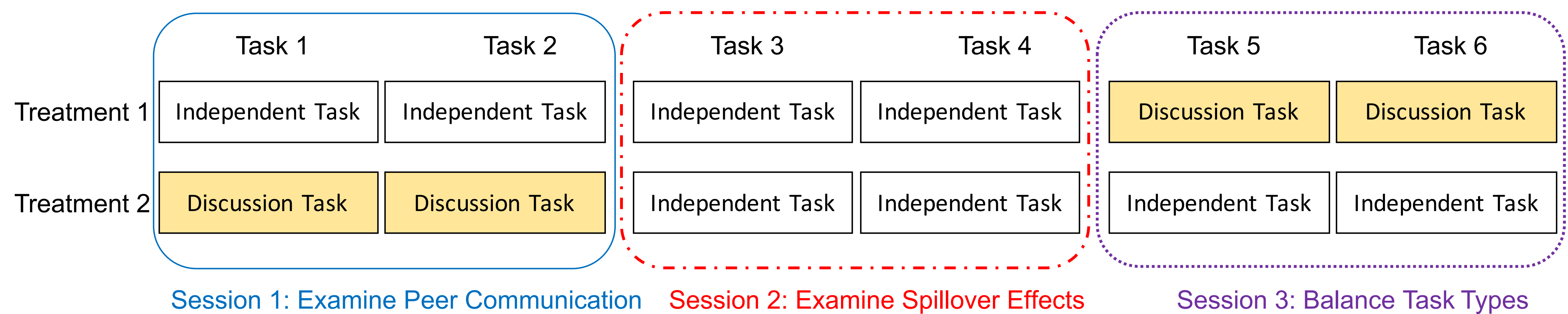
- Traditional crowdsourcing tasks assume workers complete the tasks independently.
- Peer Communication:** allow workers to work on the same task and freely discuss the task with each other.



## Examining Peer Communication via real-world experiments

**Q1: [Benefits of Peer Communication]** Do peer communication improve worker's work quality compared to that in tasks where are completed independently?

**Q2: ["Spillover" effects of Peer Communication]** Do workers produce higher independent work quality after peer communication, compared to workers who always complete tasks on their own?

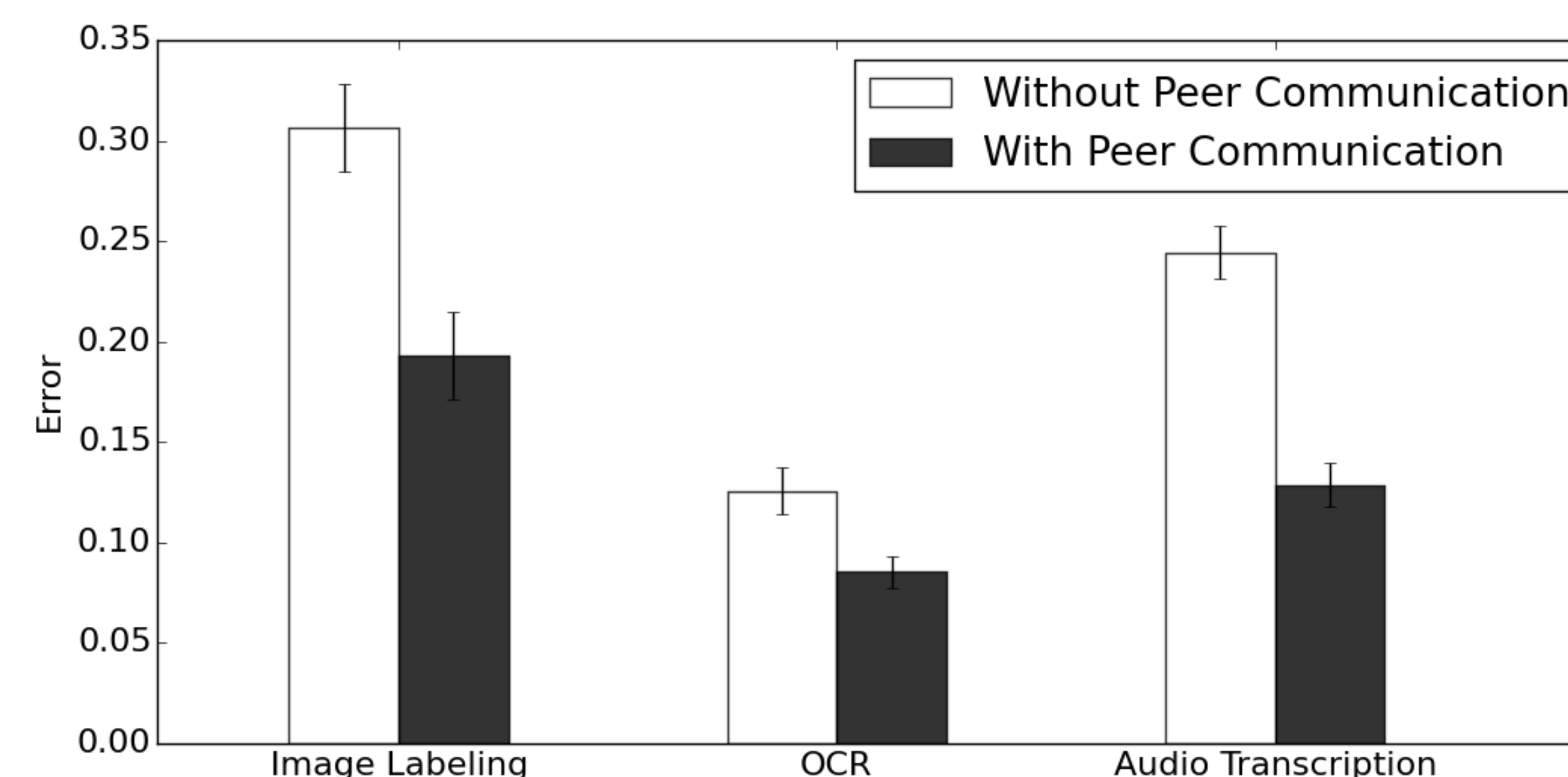


## Treatments:

- Treatment 1: 4 independent tasks followed by 2 discussion tasks.
- Treatment 2: 2 discussion tasks followed by 4 independent tasks.
- Q1:** by comparing work quality in Session 1;
- Q2:** by comparing work quality in Session 2;
- Three types of tasks: Image labeling, Optical character recognition(OCR), Audio transcription

## Results:

- Peer Communication **Improves Work quality:**

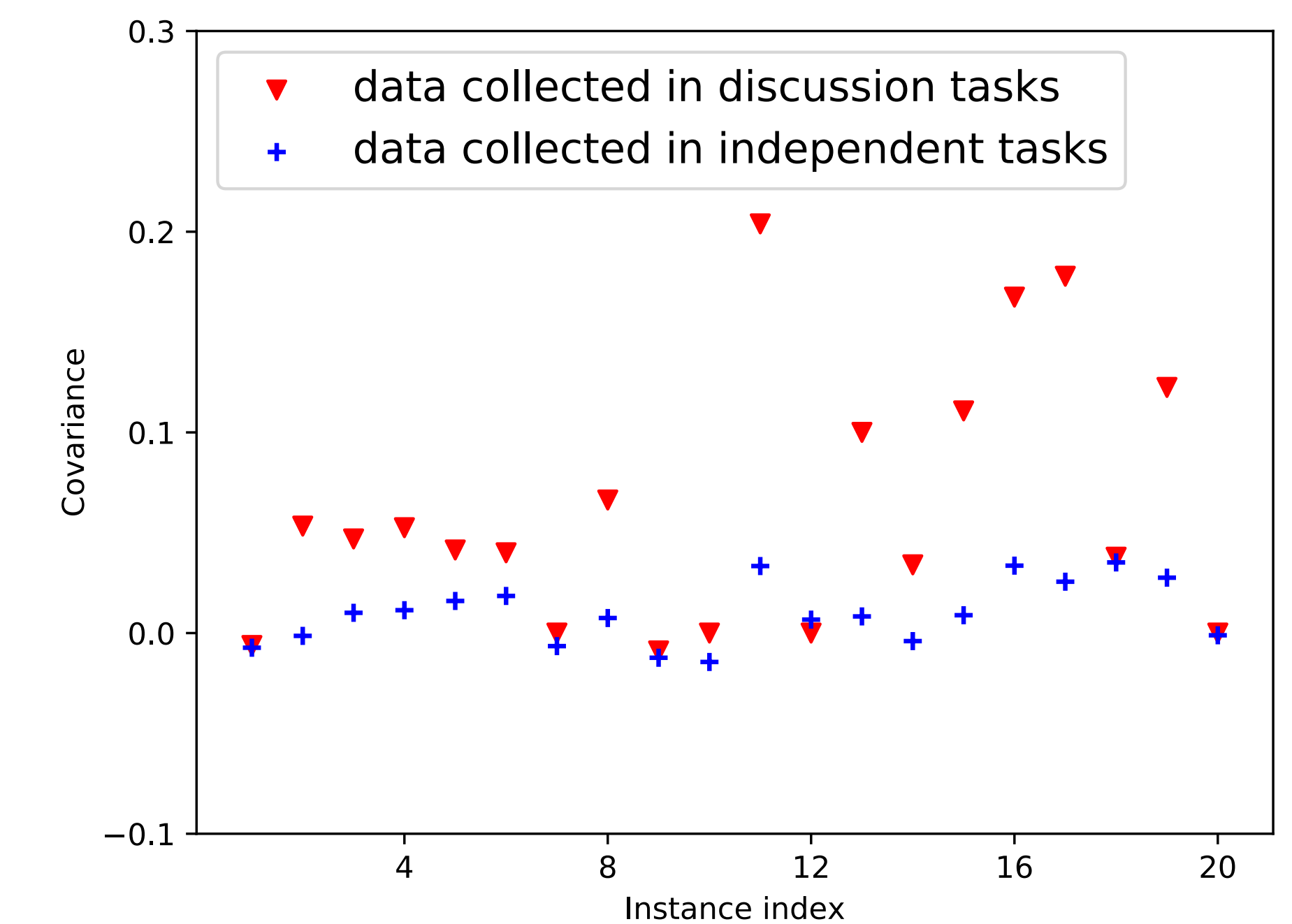


- There are **No Spillover Effects:**

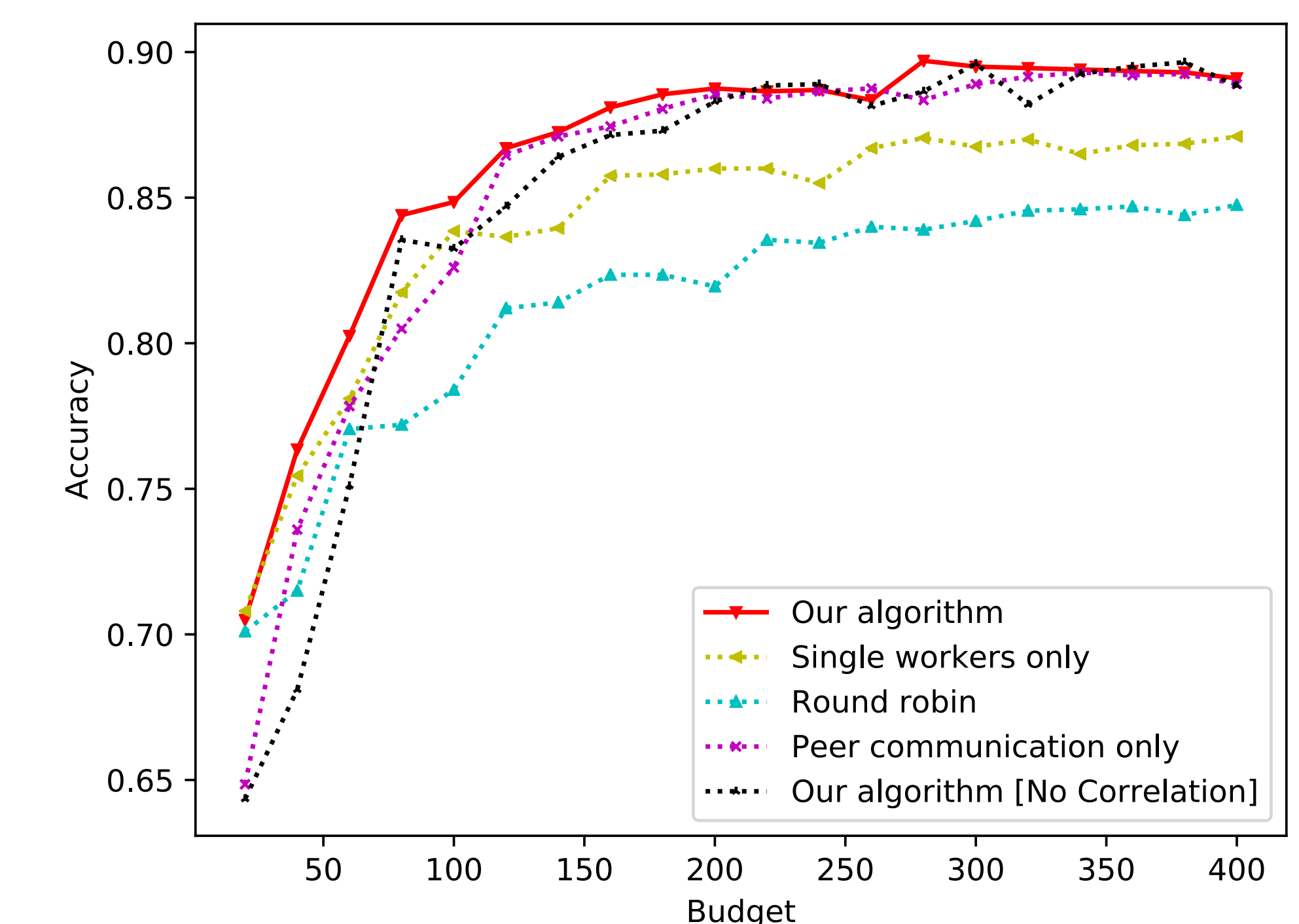
Error rates session-2 tasks	Image labelling	OCR	Audio transcription
Treatment 1	0.324	0.175	0.209
Treatment 2	0.334	0.168	0.244

## An Algorithmic Framework For Utilizing Peer Communication

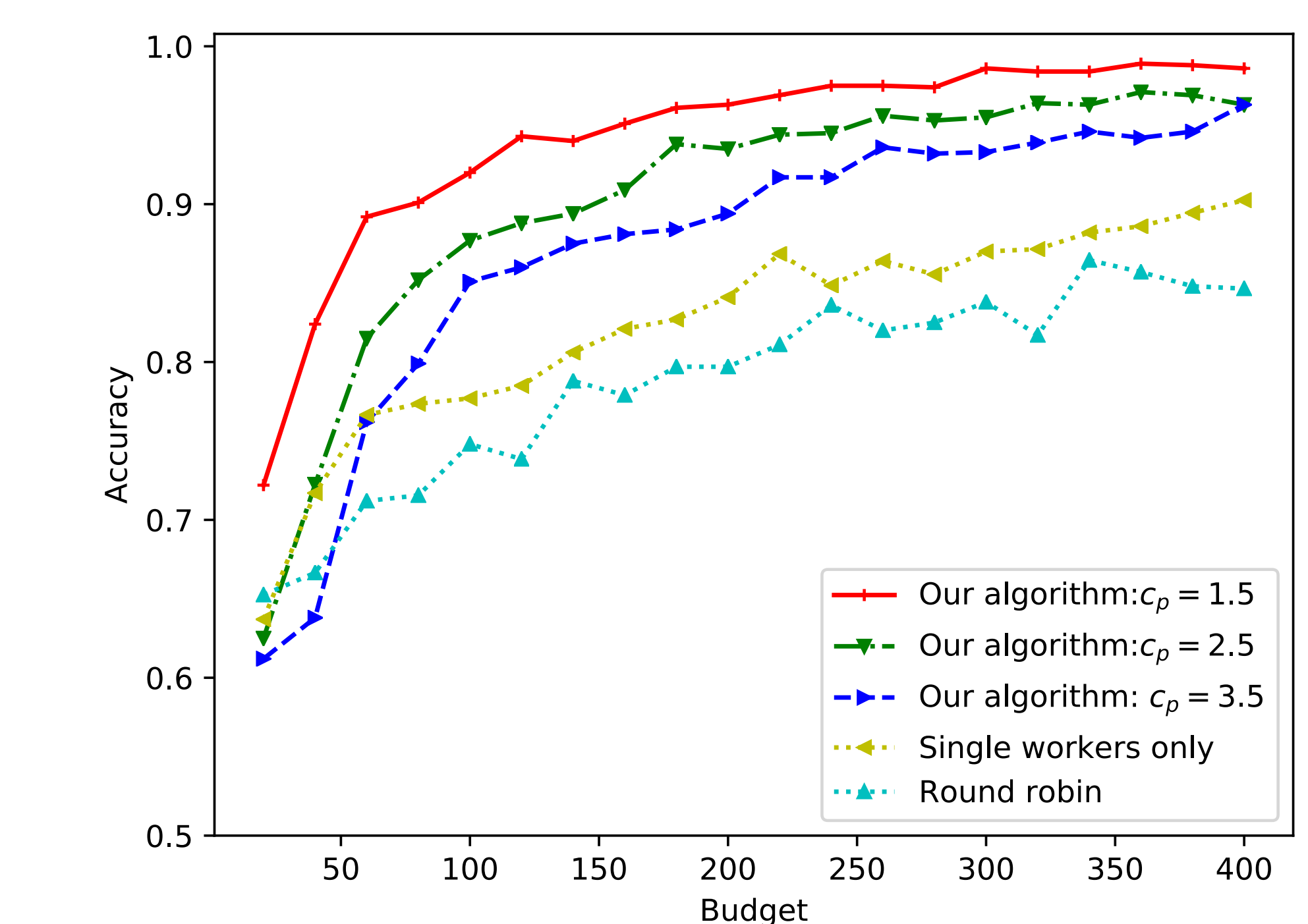
- Constrained Markov Decision Process :
  - whether** and **when** to use peer communication
- Budget constraint – peer/single cost
- High work quality but high costs, or low work quality but low costs?



- Algorithm on real-data.



- Cost of peer communication.



- Ratio of peer communication strategies deployed.

