Purdue Fall 2018

CS59000-CSC: Crowdsourcing and Social Computing

http://mingyin.org/CS590/Fall2018/index.html

Class 5: Crowdsourcing platform: Tasks and dynamics

2018.9.5

Ming Yin

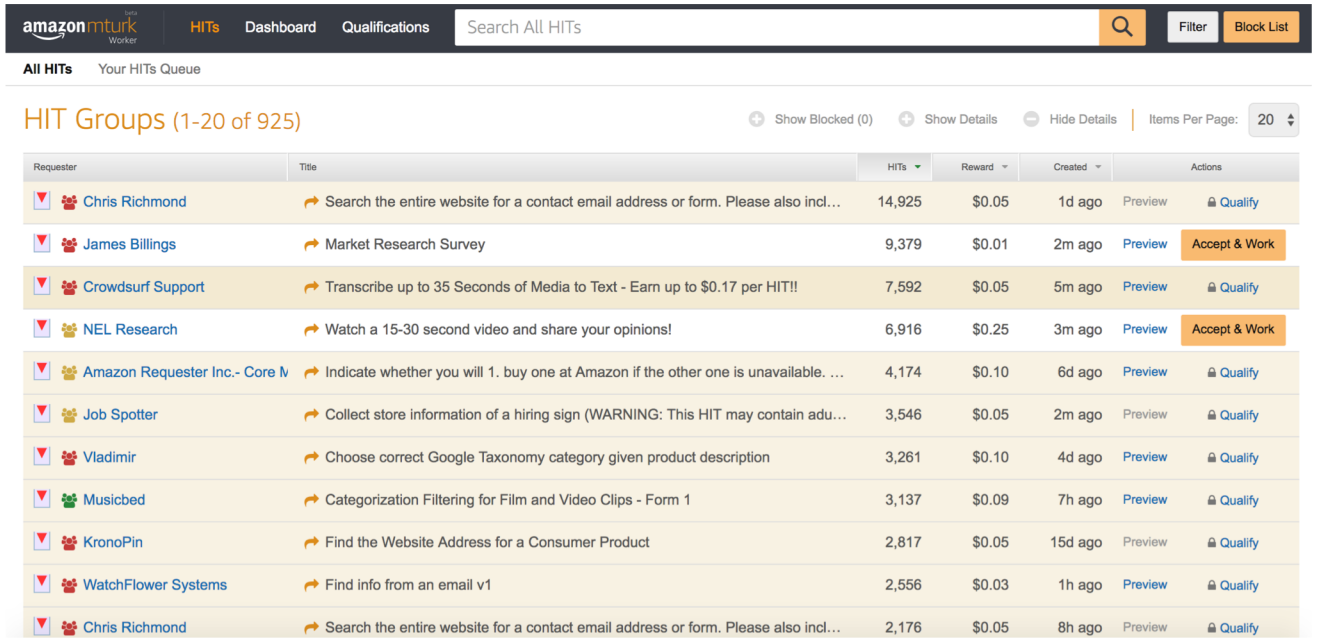
Administrative Notes

- Presentation assignment is out! Check it out on the calendar page of the course website!
- Presenters:
  - Read all required papers and at least one optional paper
  - Prepare reading questions (send them to me 1 week before your presentation time)
  - Post the reading questions on Piazza (Monday presenters: post it before the previous Friday; Wednesday presenters: post it before the previous Sunday)
  - Prepare a presentation on the topic and lead the discussion in class

Administrative Notes

- Non-presenters:
  - Read all required papers
  - Answer reading questions on Piazza on time
  - Participate in discussion in class
- Oct 10: Project pitch day → Oct 15?

Crowd Tasks and Markets



A Lot of Questions

- What are the typical types of tasks on crowdsourcing platforms?
- How does the property of crowd tasks change over time?
- How task features influence the requester's experience?
- How task features influence the worker's experience?
- A market view: supply vs. demand

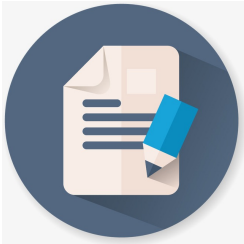
A Taxonomy of Crowd Tasks

- Surveyed 1,000 workers on CrowdFlower
- Manually annotated the type of tasks and categorized tasks into 6 classes

Information Finding

Verification & Validation

Interpretation & Analysis



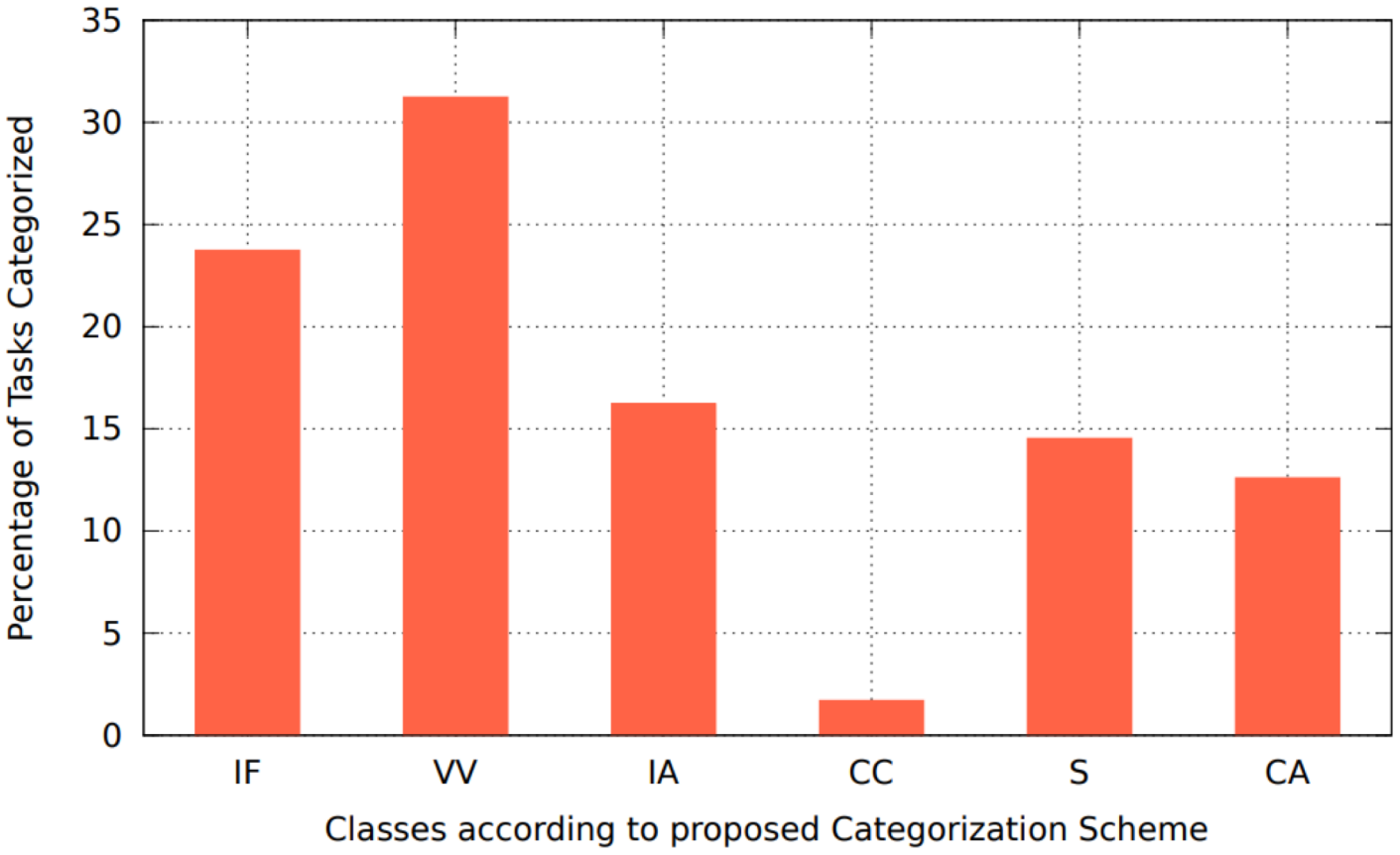
Content Creation

Surveys

Content Access

Gadiraju et al. A Taxonomy of Microtasks on the Web. HT'14

Distribution of Task Types



Problems?

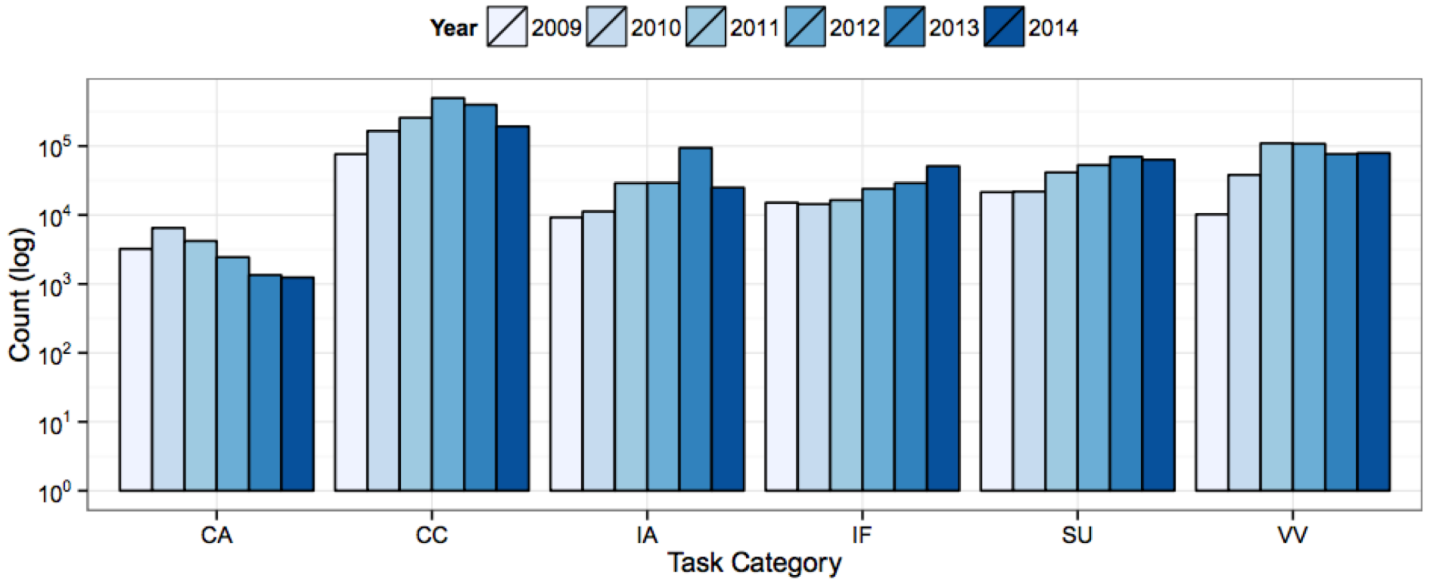
A Case Study of MTurk

- Periodically crawled data from MTurk (data is available at MTurk-Tracker)
- Hourly aggregated data on tasks from 2009 to 2014
  - Task title
  - Task description
  - Task rewards
  - Task qualifications
  - Task keywords
  - Number of tasks available
- 2.5 million batches, 130 million tasks!

Difallah et al. The Dynamics of Micro-Task Crowdsourcing: The Case of Amazon MTurk. WWW'15

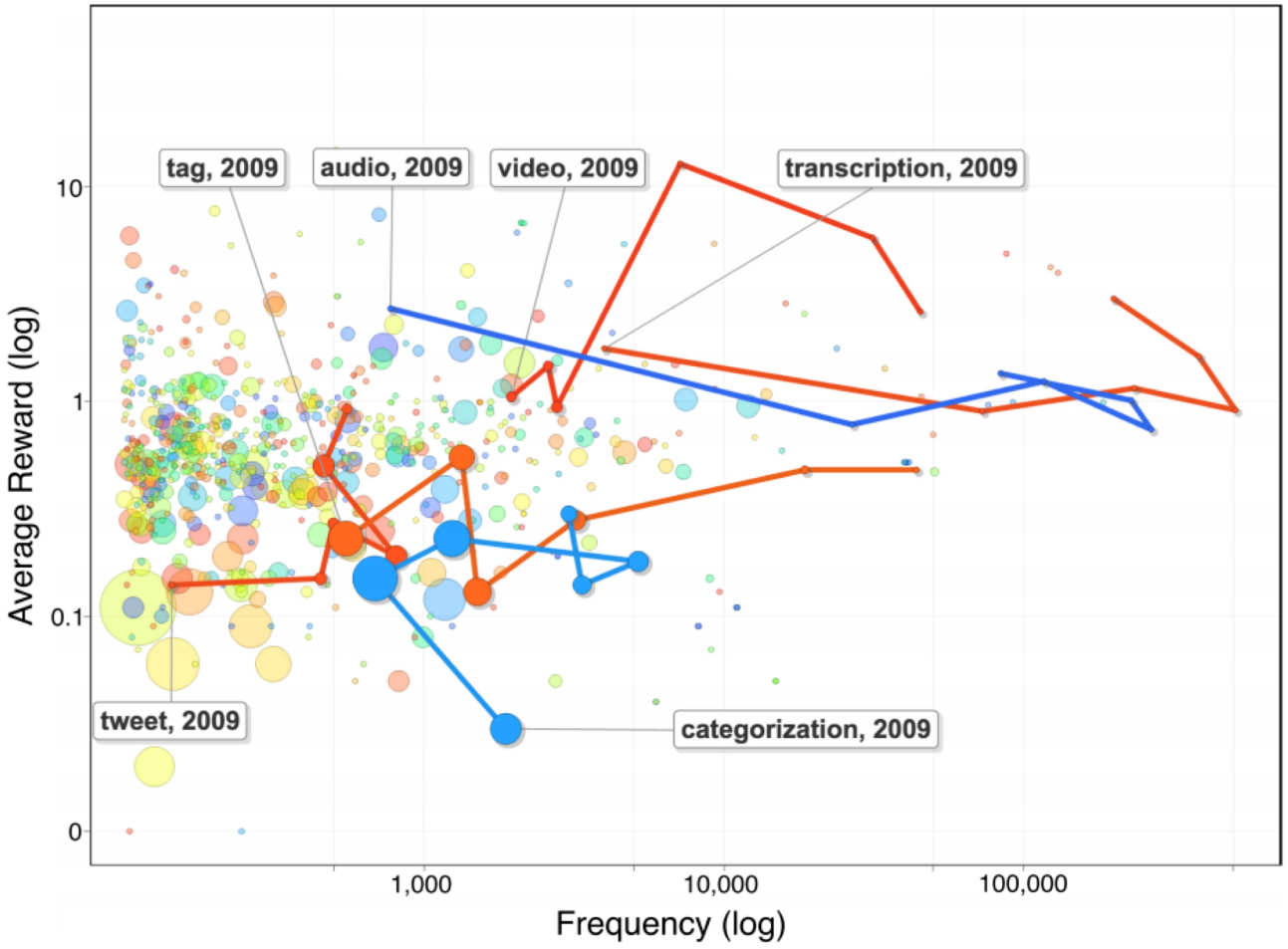
Dynamics of Task Types

- Supervised Learning for Classifying Task Types
  - Get crowd labels for a sample of 5,000 tasks
  - Use tasks with agreement to train a SVM classifier and make predictions on all other tasks



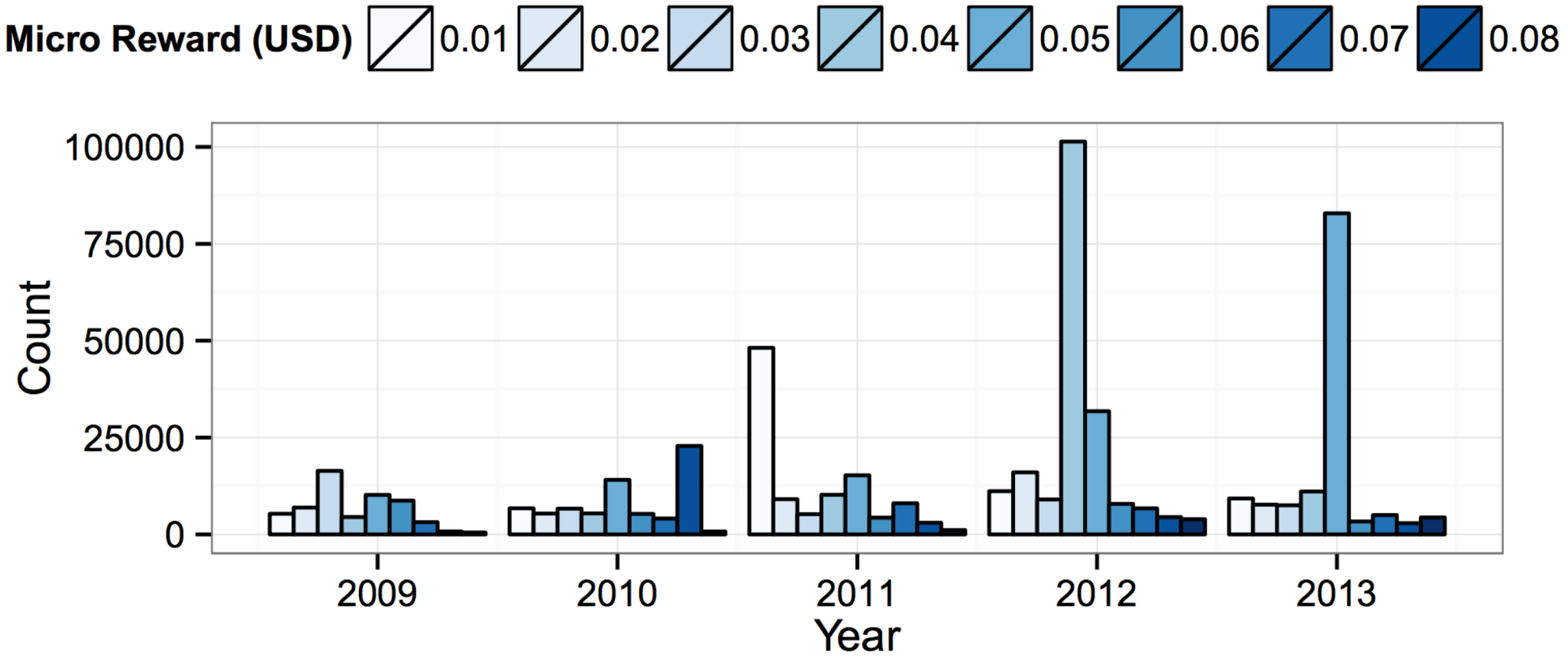
Content Access: Decreasing
Other types: Increasing

Dynamics of Task Topics



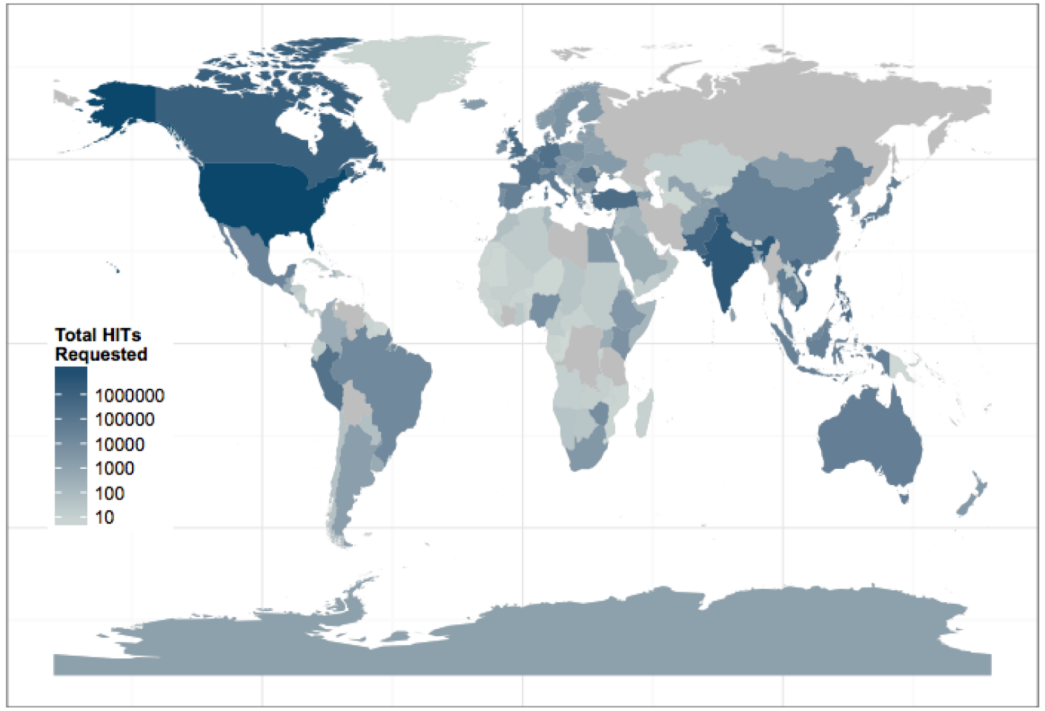
- Tasks of different topics have different ″reward levels″
- Tasks related to “audio” and “transcription” increase substantially.

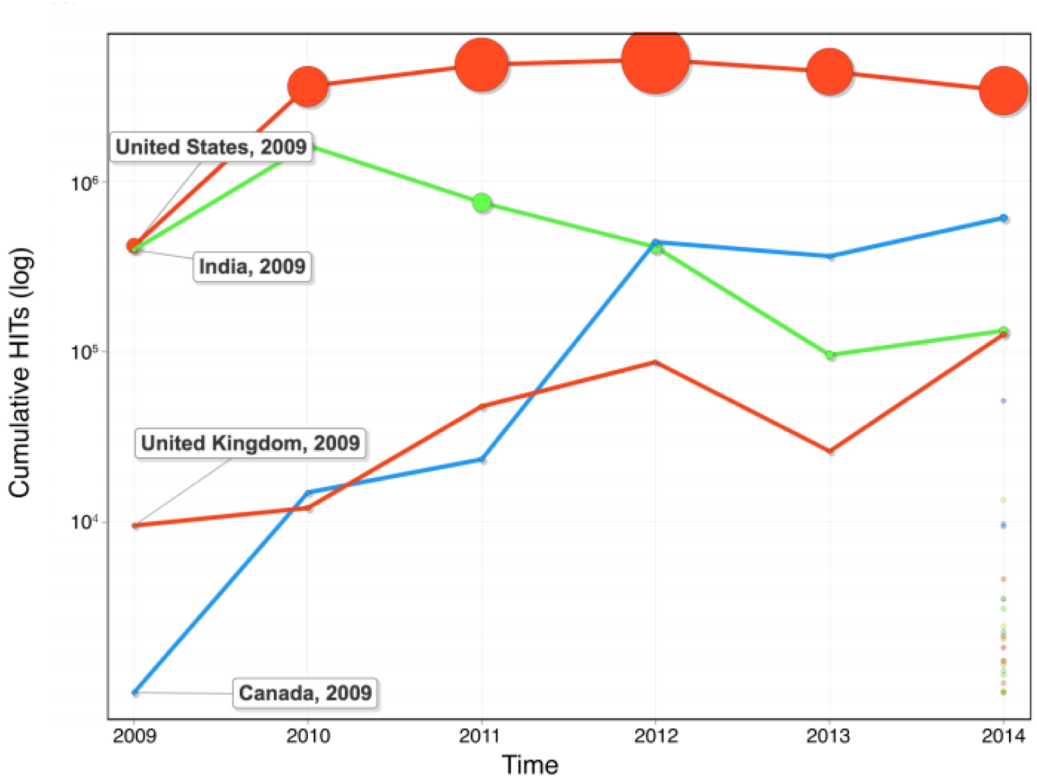
Dynamics of Task Rewards



Task rewards increase over time!

Dynamics of Task Qualifications (Locations)





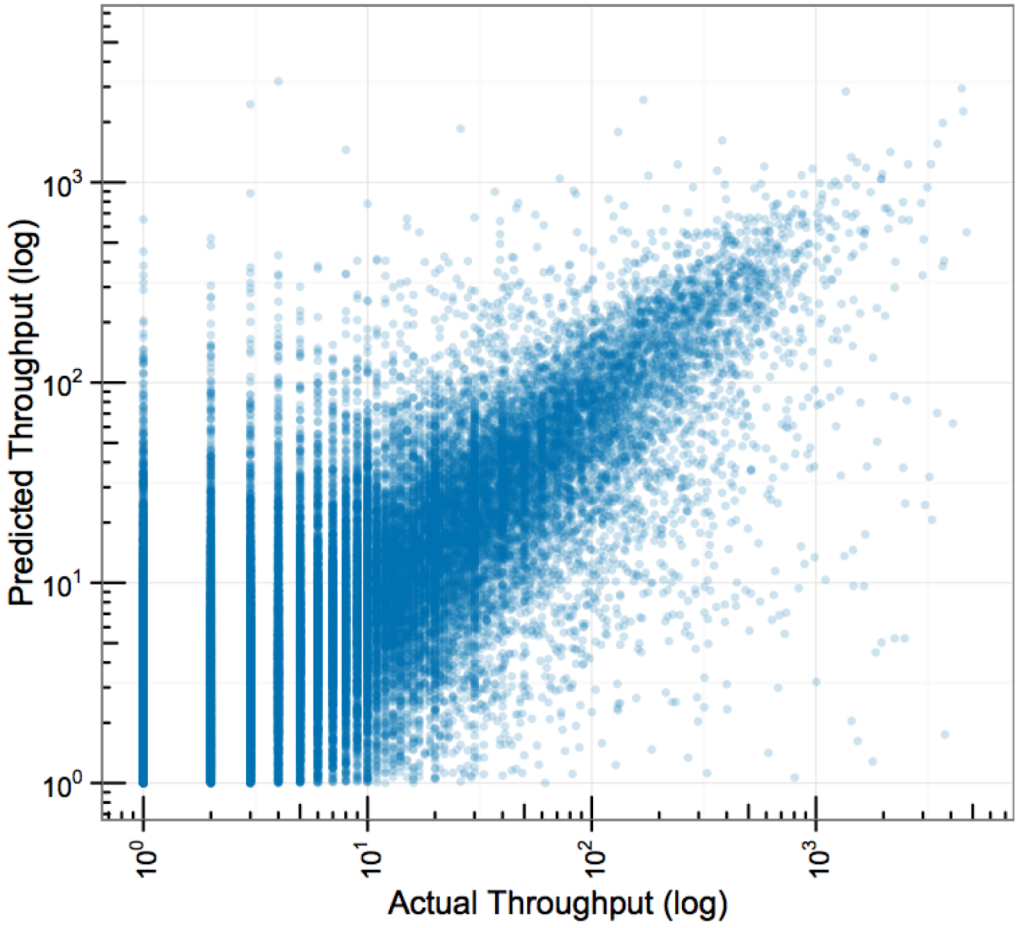
A substantial amount of tasks are exclusive to US workers, while tasks exclusive to India workers are decreasing over time!

Task Feature vs. Requester's Experience

How is the *throughout* for a batch of tasks posted by the requester influenced by task features?

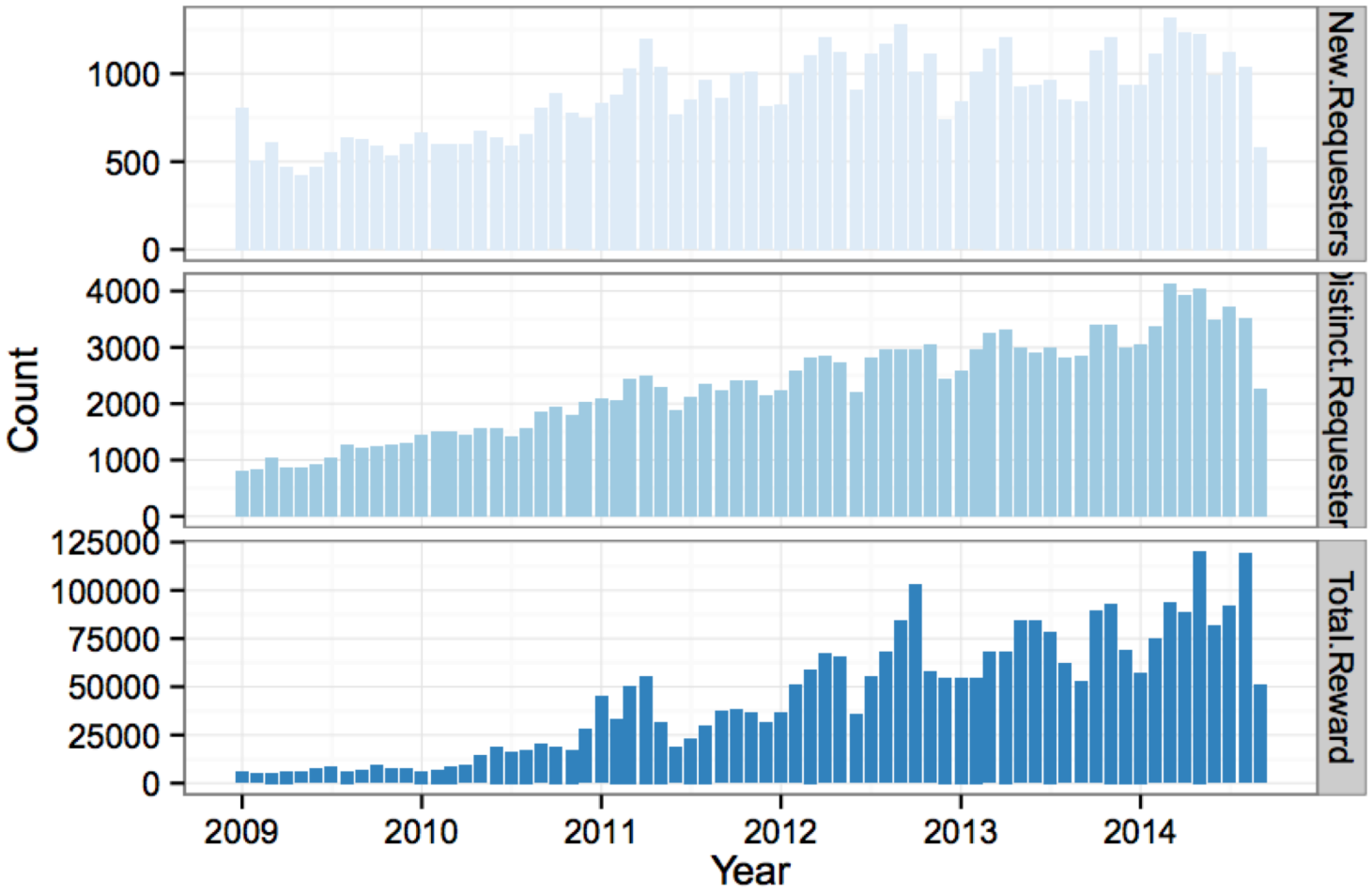
- A regression with 29 features
- To predict the throughout of tasks at time T, train a random forest regression model with tasks in time $[T\text{-}\delta, T)$
- δ=4 gives the best performance

Throughput Prediction Results

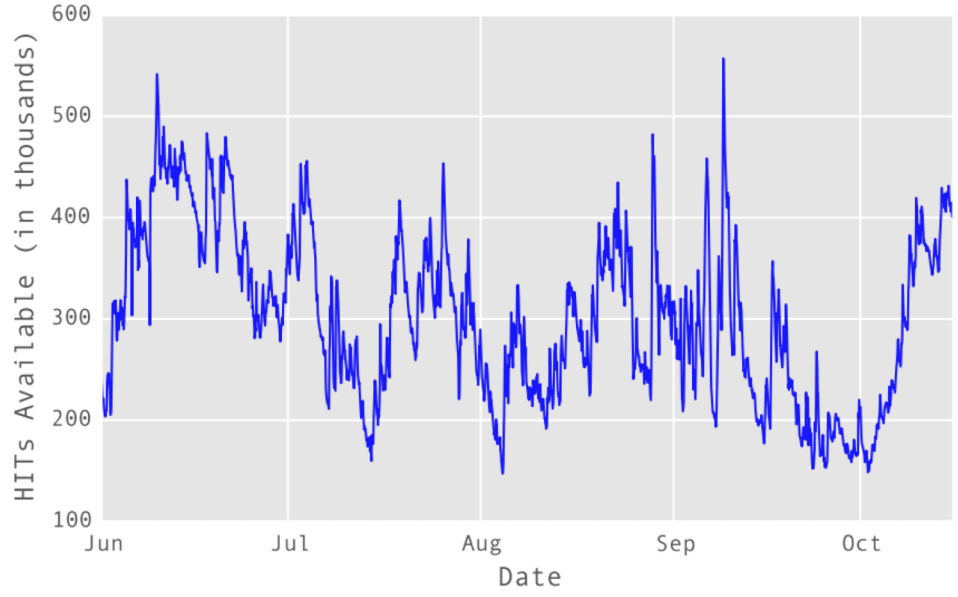


- More accurate when actual throughout is large
- Important features: # of tasks available, age of the task
- Methodology problems?

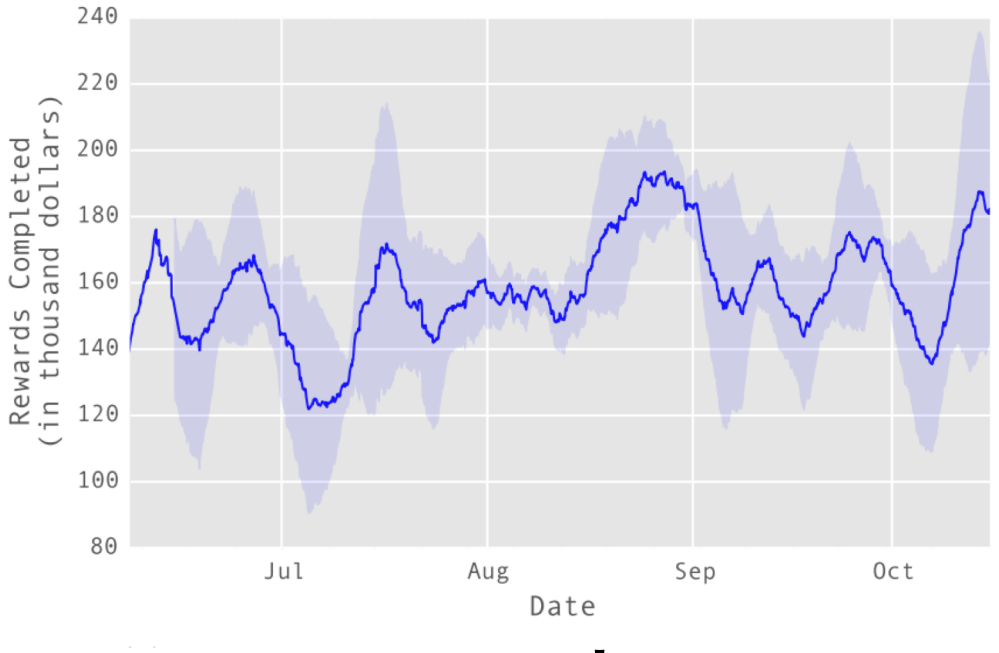
Market View: An Increasing Demand



Market View: Periodicity in Supply and Demand

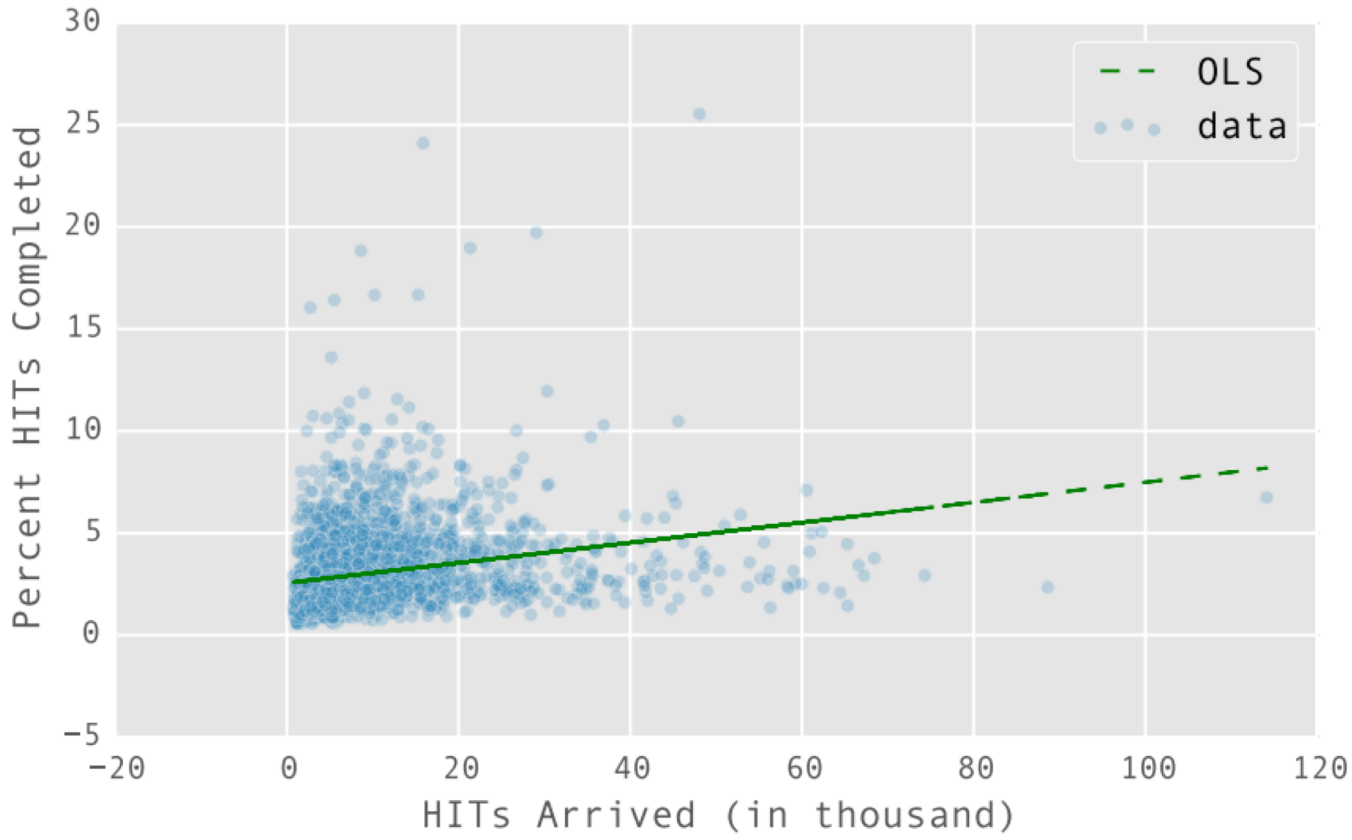


Demand



Supply

Market View: Supply Increases with Demand



- When the demand in an hour increases by 10K, the percentage of completed tasks increase by 0.5%.

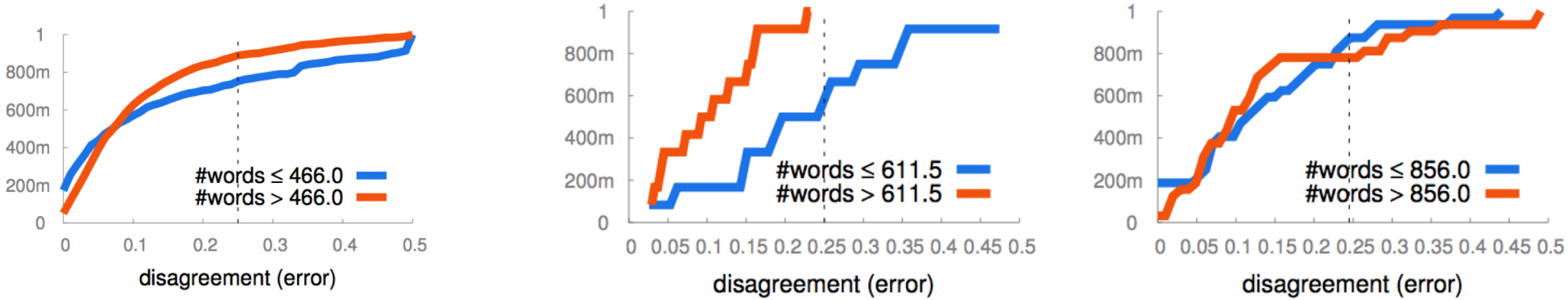
Discussion

- If you had this data, what other analyses you want to conduct to better understand crowdsourcing tasks and markets?

- Do you need to collect some additional data for these analyses? If yes, what data do you need?

More on Task Feature vs. Requester's Experience

- Task features: task length (# of words in the HTML file), existence of examples, existence of images, etc.
- Metrics for requester's experience: disagreement, task time, task pick-up time



(a) #words-disagreement: Gather **(b) #words-disagreement: Rating**

Jain et al. Understanding Workers, Developing Effective Tasks, and Enhancing Marketplace Dynamics: A Study of a Large Crowdsourcing Marketplace. VLDB Endowment, March 2017

More on Task Feature vs. Requester's Experience

- The existence of examples correlates with lower disagreement and shorter task pick-up time
- The existence of images correlates with shorter task time and task pick-up time
- How to rigorously test the causal effect?

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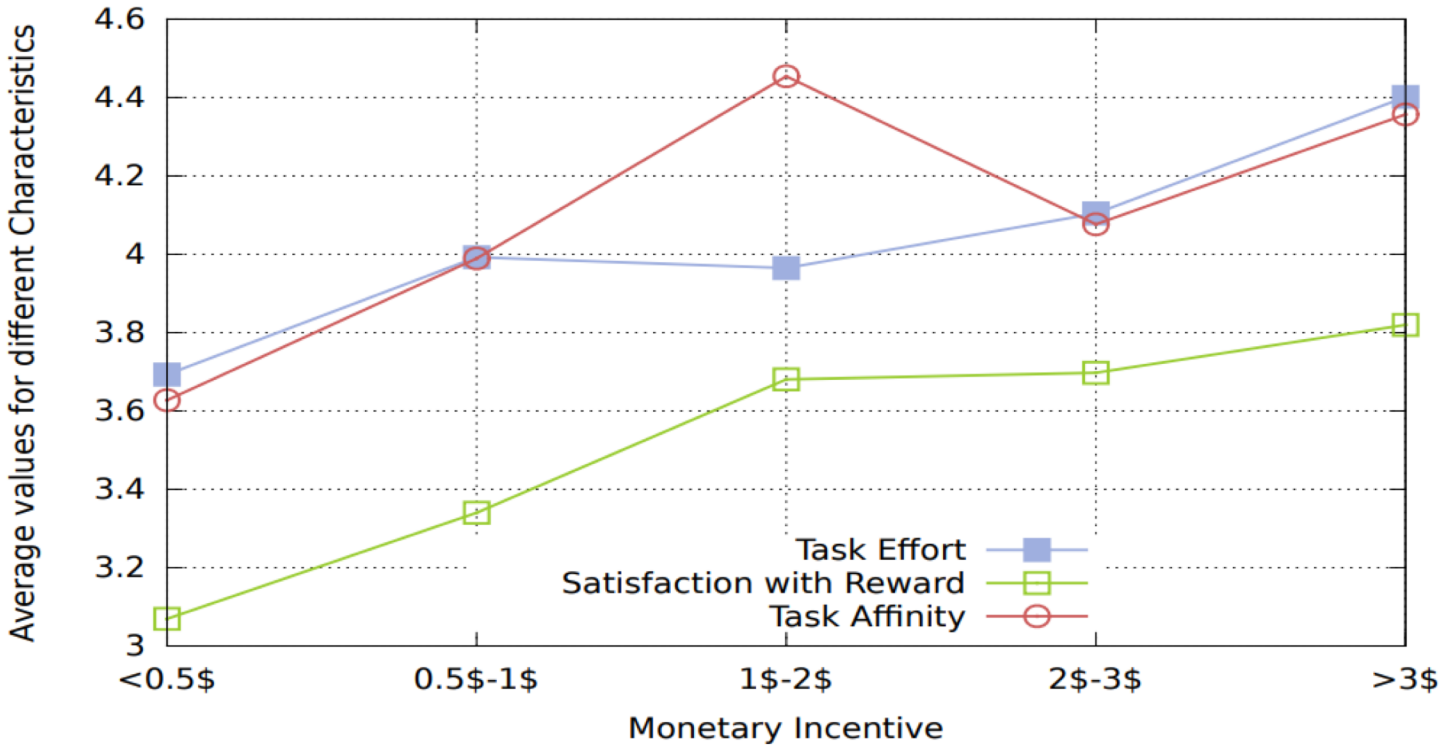
Task Feature vs. Worker's Experience



Task rewards matter!

Gadiraju et al. A Taxonomy of Microtasks on the Web. HT'14

Beyond Microtask Platforms

- Fiverr: https://www.fiverr.com/
- Upwork: https://www.upwork.com/
- What are the questions you want to ask for understanding the dynamics of these crowdsourcing platforms (especially questions that are different from what you will ask for microtask platforms)?
- What data you would need to collect to answer these questions?

Next Class

- Crowdsourcing: Opportunities and Challenges
  - Required: Kittur et al. The Future of Crowd Work. CSCW'13
  - Optional:
    - Quinn and Bederson. Human Computation: A Survey and Taxonomy of a Growing Field. CHI'11
    - Gadiraju et al. Human Beyond the Machine: Challenges and Opportunities of Microtask Crowdsourcing. IEEE Intelligent Systems, July 2015