Logistics: Assignment 3 and Project Milestone 1

- Assignment 3: Due Oct 18 (Mon)
  - Don’t wait till the last minute
  - Check your late-day usages

- Project milestone 1: Due tomorrow, Oct 15 (Fri)
  - Initial literature survey (around 3~5 references)
  - A plan on what you want to do for the remaining of the semester
    - Formalize your research question and approaches, e.g.,
      - Theory/simulation project: formalize your models
      - Data-analysis project: figure out where and how to get data and what you plan to do with it
      - Experiment/application project: have a prototype design and an evaluation plan
    - Include a timeline (weekly or biweekly) on what you plan to do
      - Nov 2: Midterm Project Pitch and Discussion
      - Nov 5: Milestone 2

Logistics: More about Assignment 3

- Understanding Bayes' theorem and conditional probability

- Problem 2
  - Assignment prior: 80% good, 20% bad
  - Two randomly drawn graders 1 and 2 are reviewing the same assignment

	Signal	
	G	B
Good	80%	20%
Bad	40%	60%

- What is the probability for a grader to receive signal B for an assignment randomly drawn from all assignments
- If grader 1 receives signal B, what is the probability that grader 2 (grading the same assignment) also receiving signal B?

  - If you don't know how to approach the above problem on top of your head, you might have a hard time for assignment 3.

Logistics: More about Assignment 3

- Understanding Bayes' theorem and conditional probability

- Problem 3
  - Recommendation letter writing as Information design
  - Qualification prior: 30% above the bar, 70% not above the bar
  - Consider a letter writing strategy:
    - When the student is above the bar, I say the student is above the bar with 100% chance
    - When the student is not above the bar, I say the student is above the bar with 20% chance

  - When the company receives a letter saying the student is above the bar
    - What is the posterior probability that the student is really above the bar

Logistics: Project Milestone 2

- Milestone 2: Due Nov 5
  - Summarize your progress
  - Last chance to convert a research project to an extensive literature survey

- What's the expected amount of literature survey?
  - Case by case
  - As a general guideline, the minimum number of papers
    - For research project: 3~5 papers (# papers in one lecture)
    - For literature survey project, 15~20 papers (# papers in one "topic")

Logistics: Project Midterm Pitch and Discussion

- Milestone 2: Due Nov 5 (Friday)

- Midterm Pitch: Nov 2 (Tue), in lecture
  - More details to come
  - Tentative formats:
    - Every team gives a spotlight presentation for 1~2 min
    - The entire class splits into 3 big groups
    - Each team in turn obtains the entire attention of the big group
      - Using this time to collect data, obtain feedback, get suggestions, etc
    - Try to think about what you can do with this time in your milestone 1 plan and utilize it
  - Let me know early if it's helpful to utilize the entire class for help
    - Might be able to allocate a small amount of time in a need basis

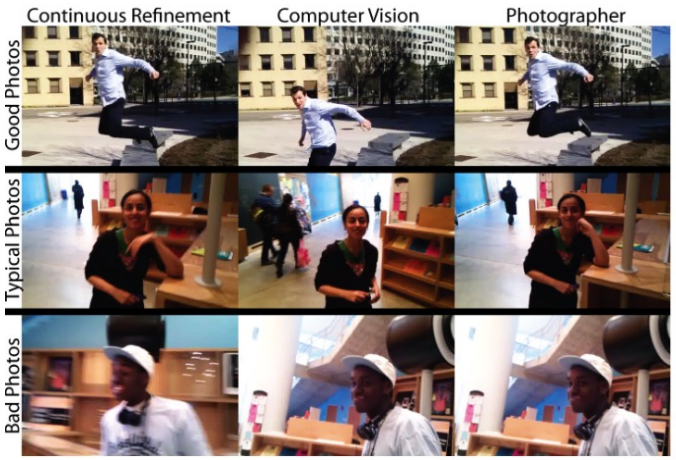
Student Presentation

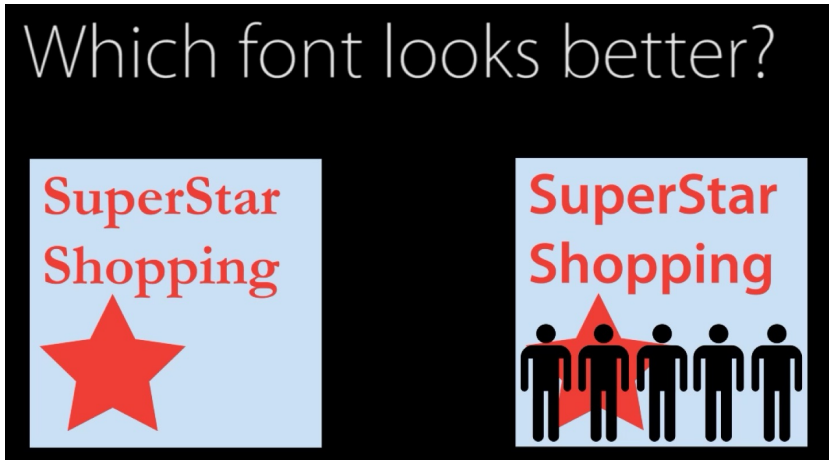
- Again, remember to submit the peer review form by 6pm

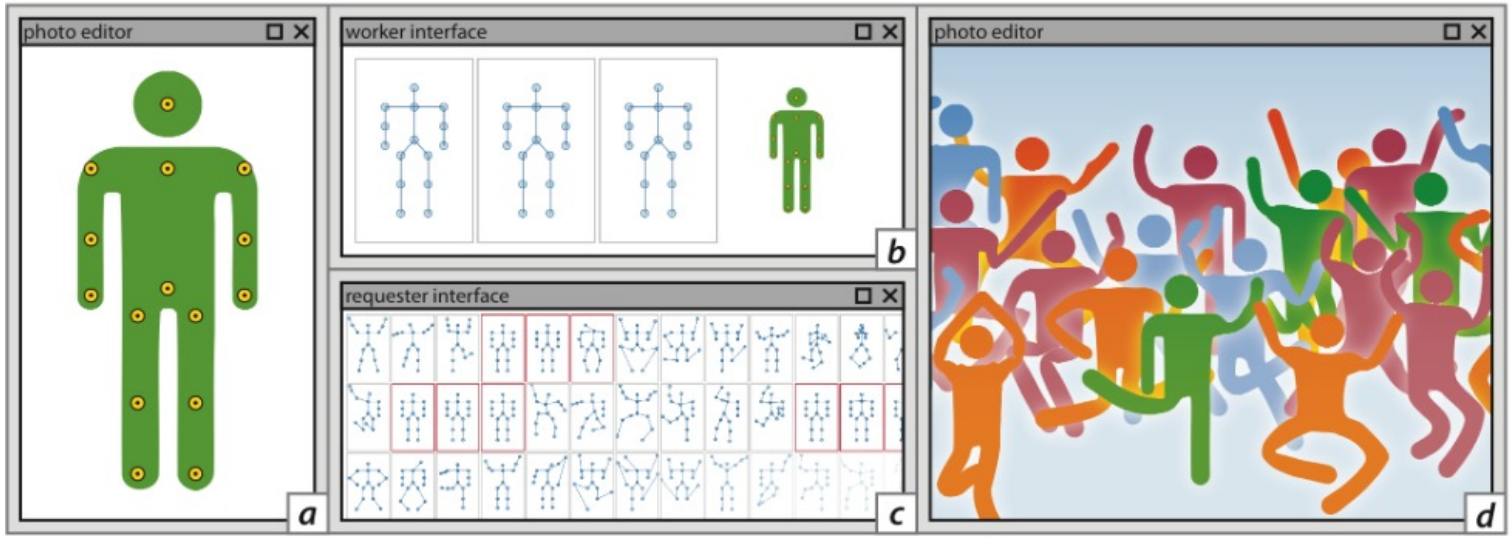
Lecture 13
Real-time Crowdsourcing

Instructor: Chien-Ju (CJ) Ho

Crowds in Two Seconds [Bernstein et al. UIST 2011.]



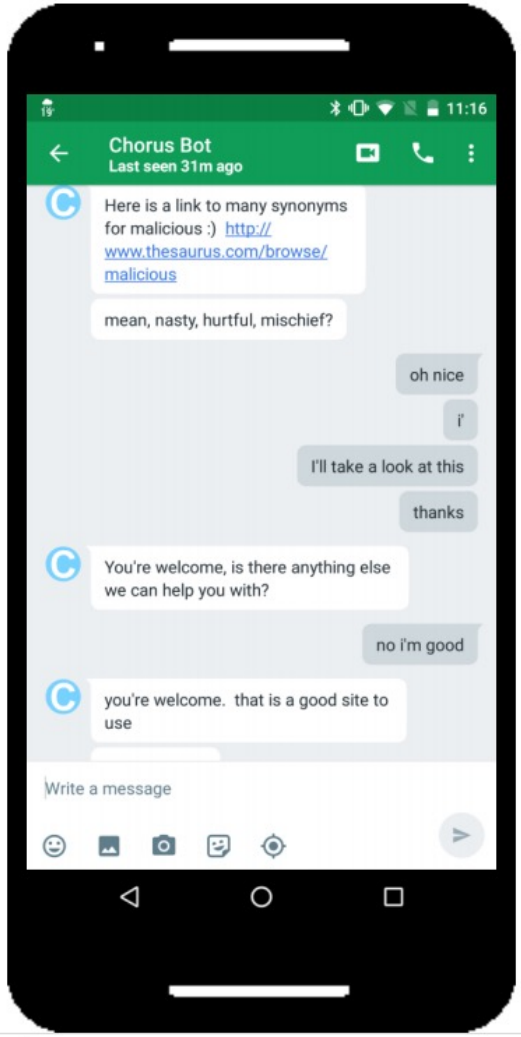




VizWiz [Bigham et al. UIST 2010]

- Answer Blind People's Visual Questions

Crowd-Powered Chatbot [Huang et al. HCOMP 2016]



- There are impressive progress in Chatbots, but it's still not good enough

> **Amazon launches $2.5 million Alexa Prize for college students building bots**

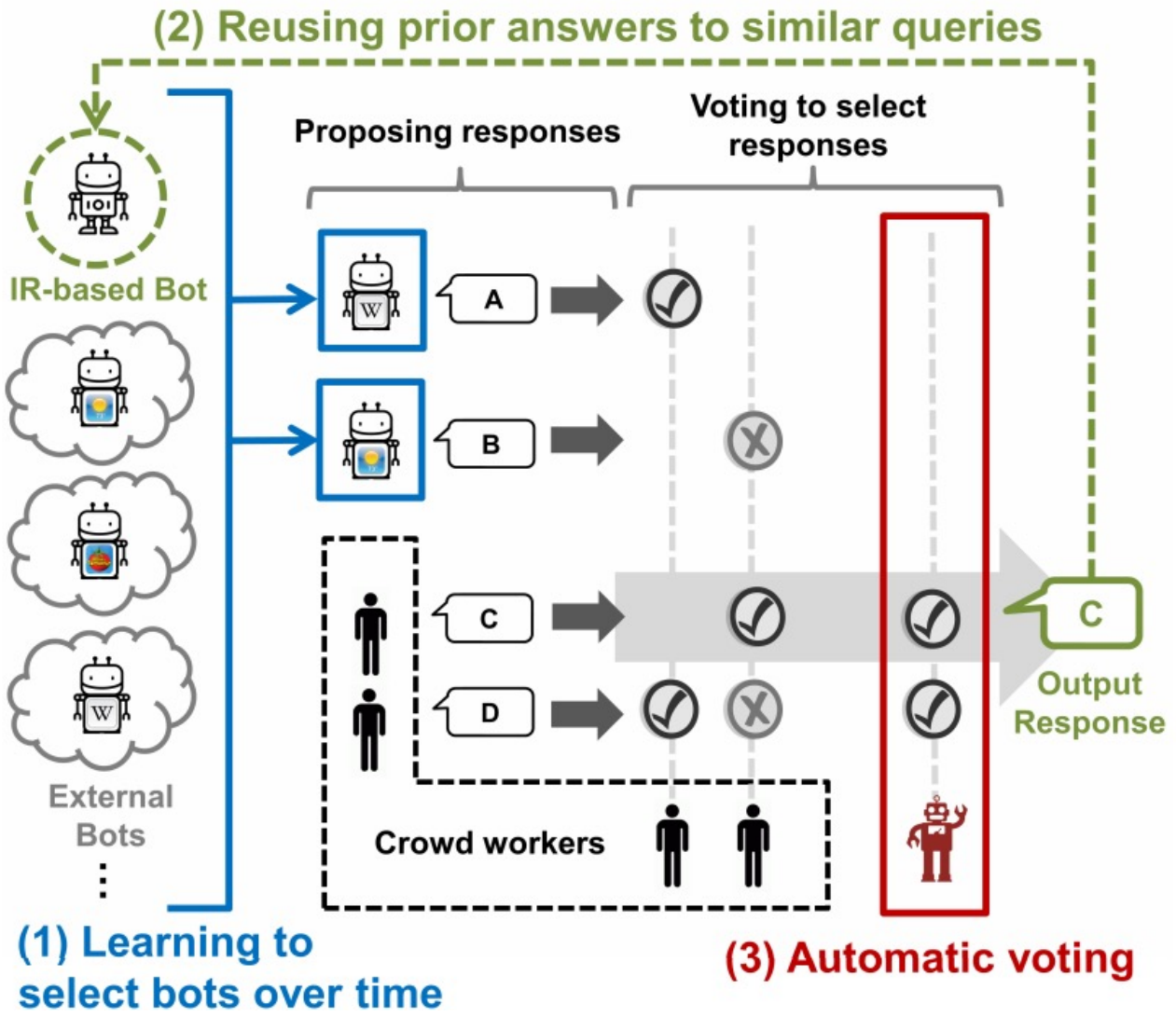
- A crowd play as a chatbot by
  - Propose responses
  - Vote for the best one
  - Take notes

- Intermediate solutions; dataset generation

Auto-Evolving Crowd Chatbot [Huang et al. CHI 2018]

- Train AI chatbots with historical data
- A crowd consists of both humans and AIs
  - Propose responses
  - Vote responses
- May even consider dynamically determining the ratio of AIs

Auto-Evolving Crowd Chatbot [Huang et al. CHI 2018]



Task Delegability

- When are humans preferred than AI in doing tasks
  - Humans can do better than AI
  - Ethical/legal concerns or trustworthy issues
  - We *want* humans to do the tasks

Ask not what AI can do, but what AI should do: Towards a framework of task delegability

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Twitch Plays Pokemon

- https://www.twitch.tv/twitchplayspokemon

Twitch Plays Pokemon

- Guinness World Record:
  - "the most participants on a single-player online videogame" with 1,165,140
- Best Fan Creation in Game Award 2014

- An application “for fun”, not to “solve problems”

- Highlight an interesting question
  - How should we decide which action to take?
  - Challenging for sequential actions under real-time constraints

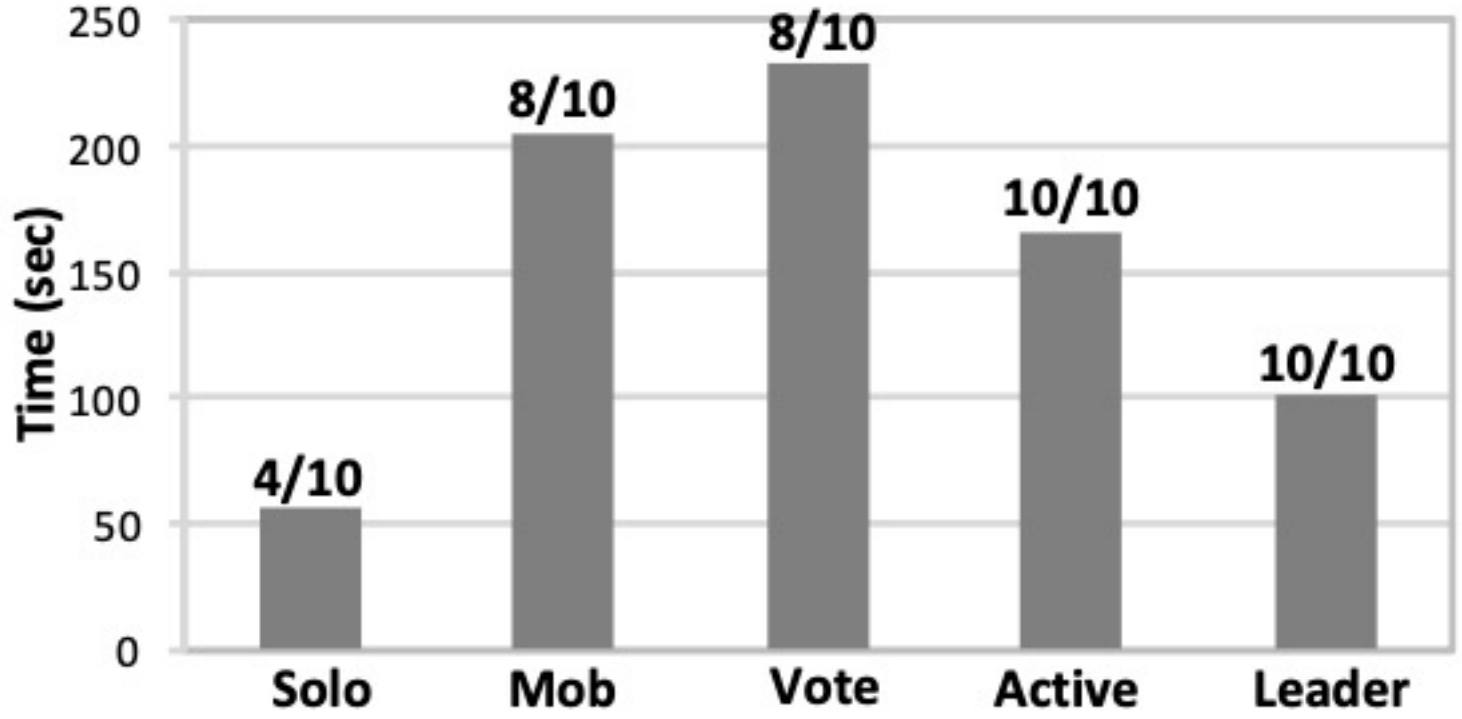
Crowd Robot Navigation [Lasecki et al. UIST 2011.]

- **Solo**: Hire a single worker
- **Mob**: Pass on all inputs to the original interface (first come first serve)
- **Vote**: Follow actions by majority vote

- **Leader**:
  - Update “weights” of users based on agreements with the crowd
  - Follow the actions by the leader (which might change over time)
- **Active**:
  - Randomly select a worker as the leader, change worker if the input is not in on time

Crowd Robot Navigation [Lasecki et al. UIST 2011.]

- Performance measure
  - Number of success (out of 10)
  - Average time to complete the task when succsess



Generally, how to aggregate preferences from a crowd?

Social choice theory

Consider Elections

- Three candidates: A, B, C, D
- Three users: 1, 2, 3, 4, 5

- Users' preferences:
  1. $A \succ D \succ C \succ B$
  2. $A \succ B \succ C \succ D$
  3. $B \succ C \succ D \succ A$
  4. $C \succ B \succ D \succ A$
  5. $D \succ B \succ C \succ A$

Assuming we use majority voting:
1. Everyone gives one vote
2. The candidate with the most votes win

Will everyone just vote for their favorite candidate?

- How should we design a mechanism to decide who wins the election

Arrow's Impossibility Theorem

- Some nice criteria we want to have:
  - **Unanimity**: If every preferences A over B, than the group prefers A over B
  - **Non-dictatorship**: no person's preference is always strictly preferred than others
  - **Independence**: If for two sets of preferences, A and B have the same order between sets, A and B should have the same order in the group decision

- Arrow's Impossibility Theorem
  - No mechanism satisfies the three criteria when the number of candidates ≥ 3