Preparing User Study

CS6501: Human-Computer Interaction

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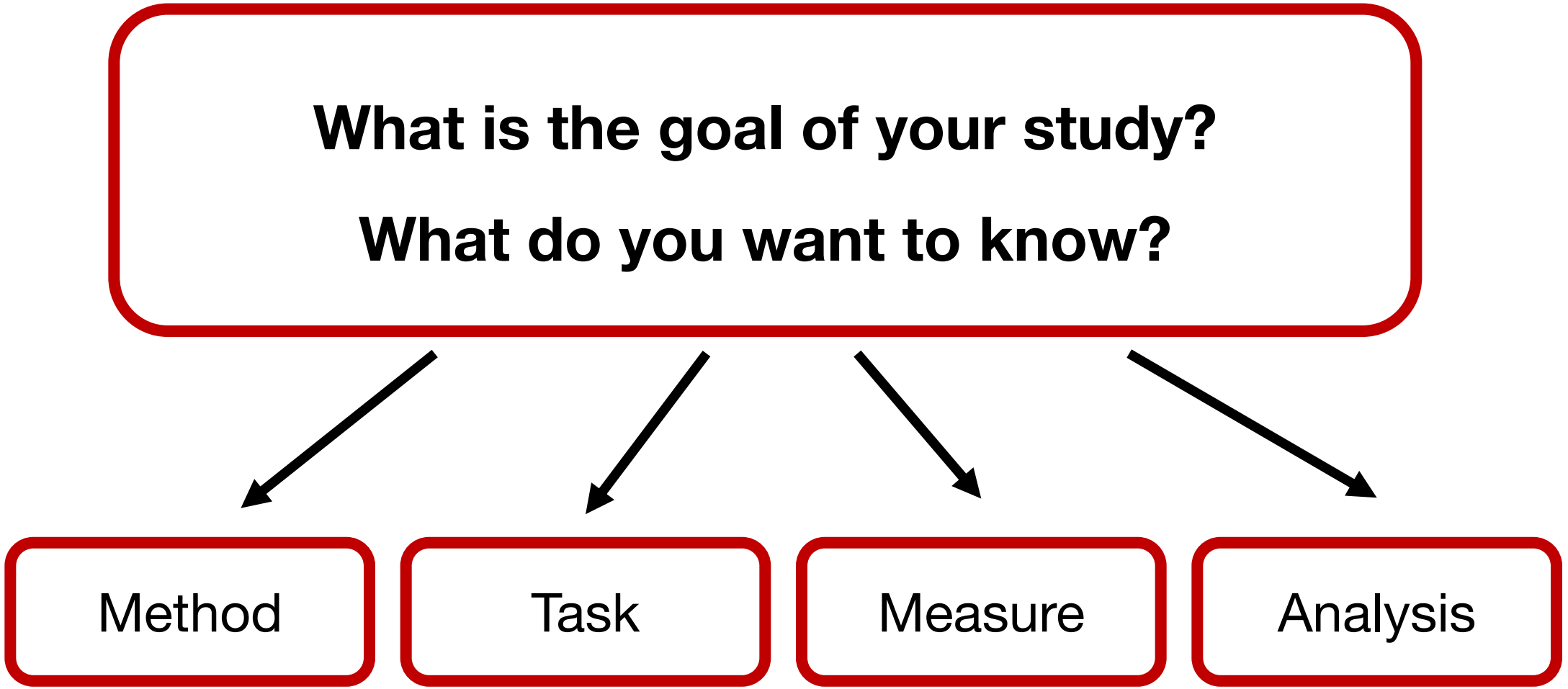
You know the methods
and have your project

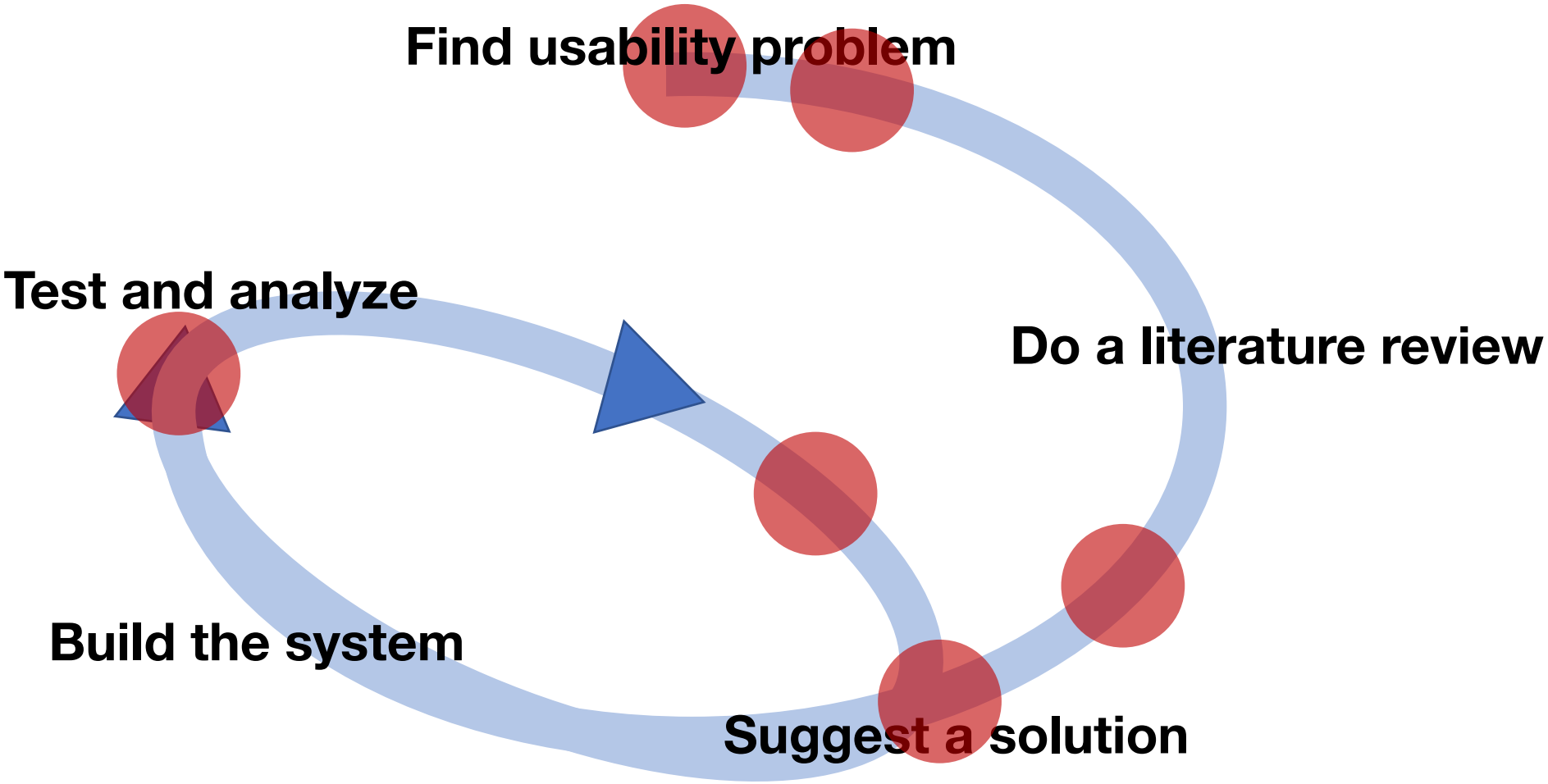
Now it’s time to plan yours

Why do you conduct a user study?

- To understand what users need
- To understand why users behave in a specific way
- To understand possible opportunities
- To validate your hypothesis
- To show performance of your method
- To characterize a method


What is the goal of your study?
What do you want to know?
Method
Task
Measure
Analysis

1 Research Project ≠ 1 User Study



1 Research Project ≠ 1 User Study

Study Examples

StreamWiki

- **Goal:** create a system that can make Knowledge-Sharing Live Streams to be more useful for streamers, moderators, and viewers
- **Two user studies**
  - **Formative study:** understanding needs to set design goals
  - **Evaluation:** understand the effectiveness of the system

Zhicong Lu, Seongkook Heo, and Daniel J. Wigdor. 2018. StreamWiki: Enabling Viewers of Knowledge Sharing Live Streams to Collaboratively Generate Archival Documentation for Effective In-Stream and Post Hoc Learning. Proc. ACM Hum.-Comput. Interact. 2, CSCW, Article 112 (November 2018).

StreamWiki: Formative Study

- **Goal:** understand experiences and needs of KSLS streamers, moderators, and viewers to set design goals
- **Method**
  - Semi-structured interviews via video calls with 6 streamers, 5 moderators, and 2 viewers
  - Asked questions about their experiences related to creating, moderating, and watching live streams

StreamWiki: Formative Study

- **Results: Their Experiences**

F1: Context loss. The interviewees mentioned that one of the biggest problems with live streaming for learning is that it is hard to understand the current context if someone joins mid-stream [M1, M2, V1, V2], or after one is distracted [V1, M3, M4], since the live video cannot be paused or navigated, "*sometimes if I miss the first few minutes of a stream, I would skip the whole stream since I find it hard to continue without knowing what has been taught*" (V1). Although they could ask the streamer or other viewers about the context by commenting, they felt unwilling to ask, because it might interrupt the streamer or other viewers [V1, V2, M3, M4], "*I would avoid asking what is going on in the stream if I missed some parts. With so many comments, the streamer may not see my question or respond to it*" (V2). It was also difficult for viewers to understand the context from comments [M5] because many comments were about emotions or crowdspeak [11].

StreamWiki: Formative Study

- **Results: Their Experiences**

F2: Challenges of dealing with many comments. All the interviewees noted that one of the biggest differences between KSLS and video lectures is the real-time interactions between viewers and the streamer. Some streamers would like to see a large volume of comments and thought that having many comments meant the viewers were interested in the topic [S1, S3], "*I often encourage my viewers to comment more in my streams. For example, I ask them to comment '1' if they understand the concept I am teaching. I think the more comments, the more engaged they are*" (S3). However, meaningful discussions can be easily buried by other comments, making it hard for streamers to identify and address critical questions [S3-S6] and viewers to focus on reading meaningful comments [M2, M3, V2]. Some streamers sometimes did not read comments to keep focused, e.g. "*to keep myself in the flow, I sometimes temporarily ignore any comment and focus on the content. I look back at them afterwards*" (S4). They might have looked back at comments after a demanding moment had passed, but often ended up missing some critical comments [S2, S4].

StreamWiki: Formative Study

- **Results: Their Experiences ➔ Design Goals**

***G1**: Provide Content and Context Information.* Viewers should be able to gain the context of a live video or content that has been talked about if they join mid-stream [F1]. This information should become available in nearly real time during the stream, and archived after the stream.

***G2**: Support the Documentation of Content and Follow-up Discussions.* Viewers should be able to quickly review the salient content of a live video by browsing or skimming through it after the live stream [F4, F6]. They should be able to search for, and navigate to, content that is of interest. They should also be able to resume discussions about the topics in the streams and have access to the context after the streams [F1, F6].

***G3**: Highlight and Archive Meaningful Comments.* Meaningful discussions should be highlighted, archived [F5], and grouped according to relevance, so that viewers can read them without being distracted by other messages [F2], both during and after the stream. The analytics of these meaningful comments (e.g., who posted and how many were posted) should also be available to provide insights about viewers' understanding of content to streamers [F7].

StreamWiki: Evaluation

- **Goal:** understand the effectiveness of StreamWiki system and gain insights about the use
- **Method**
  - Deploying the system with streamers and viewers
  - Questionnaire and interview after using the system
  - Also collected usage data

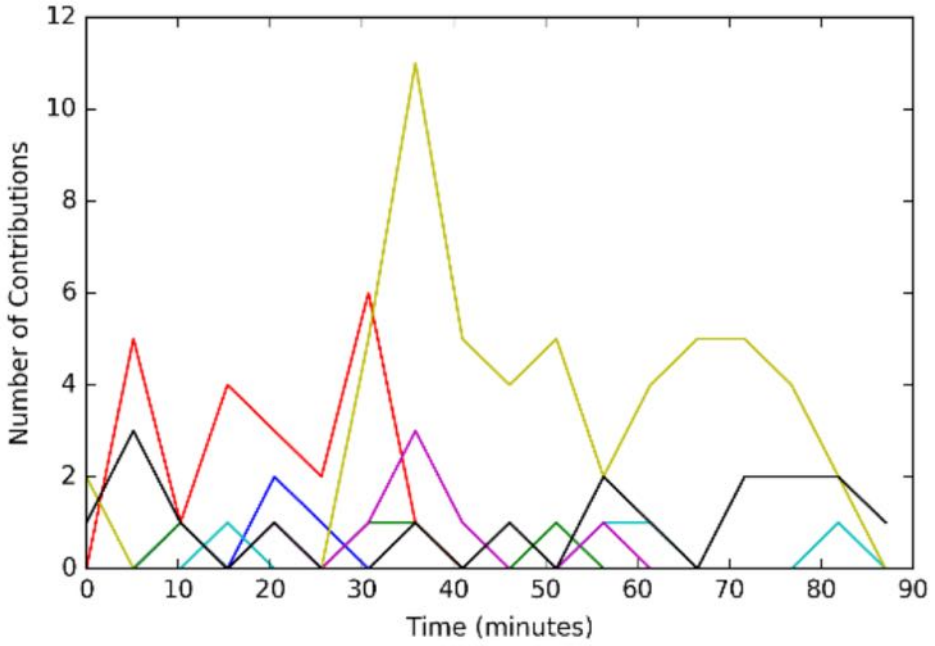
StreamWiki: Evaluation

- **Results: Usage Statistics**

	NLP3	NLP4	FCHE3	FCHE4	HCI	ECON2
# of viewers using StreamWiki	47	53	19	22	18	11
Total # of summaries	113	52	72	124	28	104
Total # of comments	137	136	28	99	63	67
Total # of cards	6	4	7	10	6	7
# of viewers who wrote summaries	7	8	8	7	6	6
# of viewers who upvoted summaries	6	7	8	4	6	5
# of times summaries were upvoted	33	30	68	47	35	42
# of viewers who posted comments	18	15	6	8	10	9
# of viewers who upvoted comments	14	9	5	5	3	9
# of times comments were upvoted	82	55	23	62	18	25
# of comments that became Danmaku	15	4	5	22	2	3

StreamWiki: Evaluation

- **Results: Usage Statistics**



- Most viewers did not propose improvement to summaries
- Attention of viewers drops after about 40 minutes

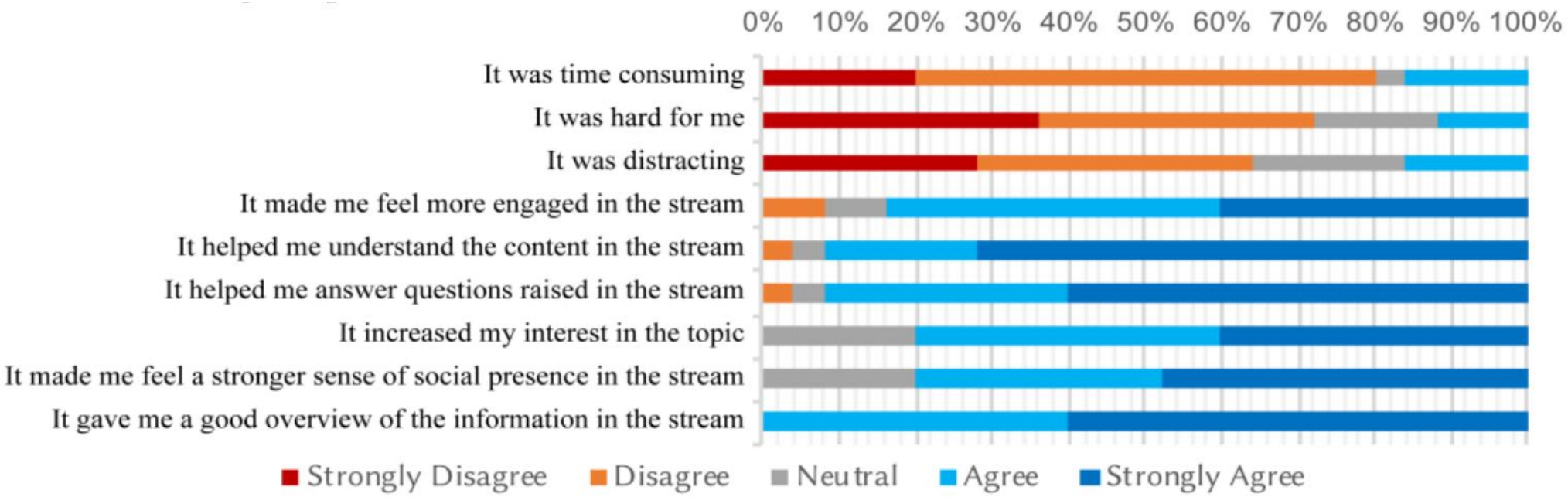
StreamWiki: Evaluation

- **Results: Usage Statistics**

By looking into the summaries and comparing them to the archived video and the streamers' outlines or slides, we identified that 471 of the 493 summaries (95.5%) somewhat represented content in all the six streams. Twenty-two summaries were not related to the content, including off-topic questions (6), streamer-related (5), jokes (4), UI related questions (2), greetings (2), digressing (2), and trolling (1). They were also distributed unevenly among streamers, indicating that they might be dependent on the style of the streamer's community.

StreamWiki: Evaluation

- **Results: Experience of Using StreamWiki**



StreamWiki: Evaluation

- **Results: Experience of Using StreamWiki**
- Reading summaries by others improves understanding.

> *“Some people may find it hard to learn since live streams often don’t have captions. The cards can serve as a form of **captions** to help these learners.”*
>
> *“For live streams it is common to encounter **unstable connections** and **missed out** important parts. The summaries on cards can help me quickly **recover** from it”*

StreamWiki: Evaluation

- **Results: Experience of Using StreamWiki**
- Summaries encourage peer learning

> *"I personally don't like taking notes and I am not good at it, but using StreamWiki I could **make use of the notes of other good note-takers**, and I learned a lot from them" (P2)*

> *"Since every viewer has different ideas, I felt **inspired** by reading summaries written by different viewers and got some **new understanding** about the content" (P20)*

StreamWiki: Evaluation

- **Results: Experience of Using StreamWiki**
- Concerns about quality of summaries.

> *"I am more interested in notes [summaries] written by those who have at least **the same level of understanding** with me, but I cannot check this" (P17)*

StreamWiki

- **Goal:** create a system that can make Knowledge-Sharing Live Streams to be more useful for streamers, moderators, and viewers
- **Two user studies**
  - **Formative study:** understanding needs to set design goals
  - **Evaluation:** understand the effectiveness of the system

Consecutive Distant Taps

- **Goal:** design a new gesture that can enrich touch interaction while not conflicting with existing touch gestures
- **Three user studies**
  - **Data collection study:** understanding current use of gestures
  - **Evaluation 1:** understand the feasibility of new gesture 1
  - **Evaluation 2:** understand the feasibility of new gesture 2

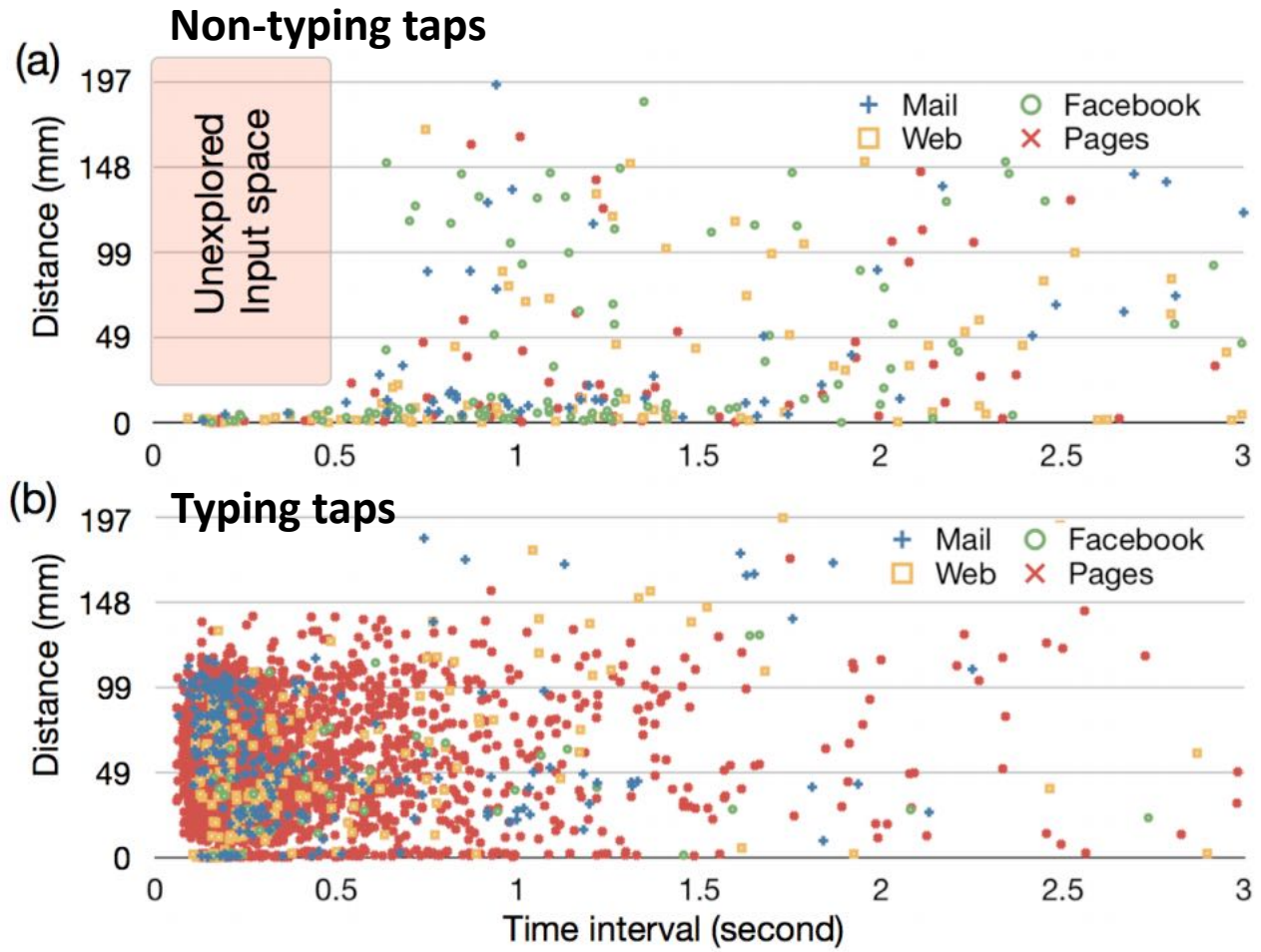
Seongkook Heo, Jiseong Gu, and Geehyuk Lee. 2014. Expanding touch input vocabulary by using consecutive distant taps. CHI '14

CDT: Data Collection Study

- **Goal:** understand current use of touch gestures
- **Method**
  - Data collection using a hacked iPad
  - Bring participants to the lab to freely use the iPad for
    - Checking emails, Browsing social media, Browsing web, Composing word documents, Playing games
  - All touch events were collected (14k+)

CDT: Data Collection Study

- **Results:** touch gesture usage data

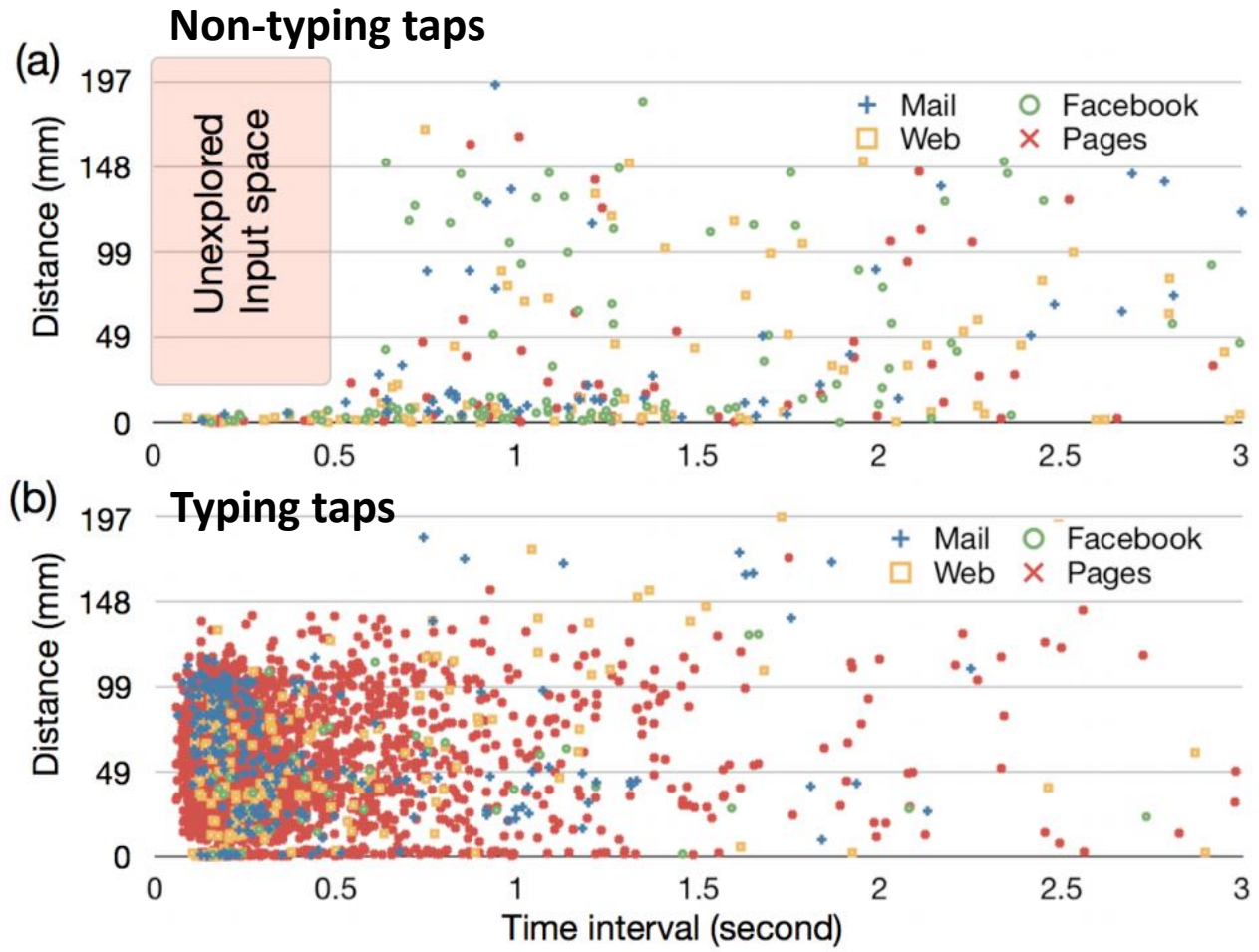


CDT: Data Collection Study

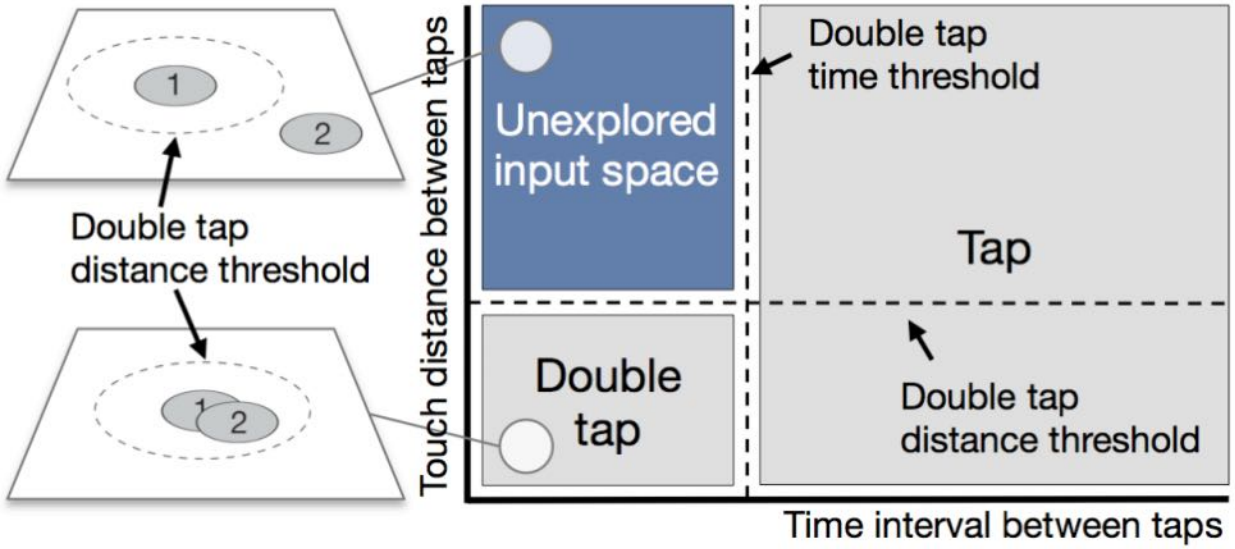
- **Results:** touch gesture usage data

  ➔ Insights about the unexplored input space

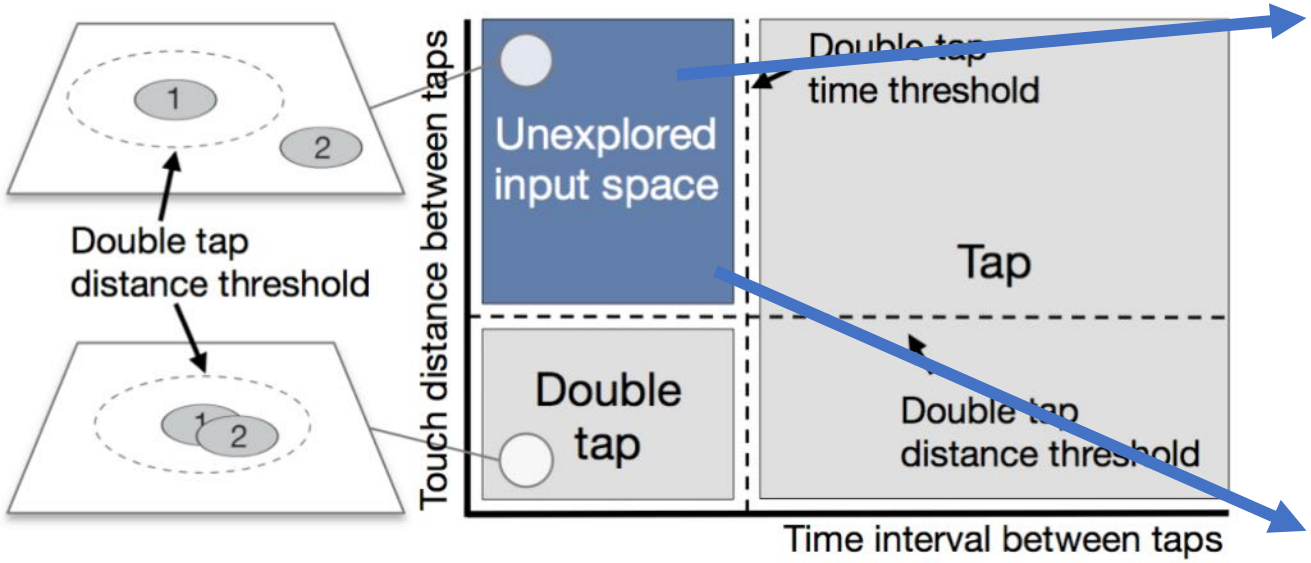
  ➔ Detection parameters

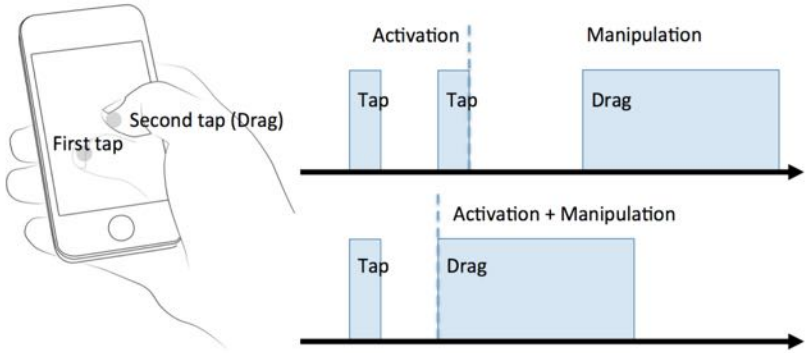


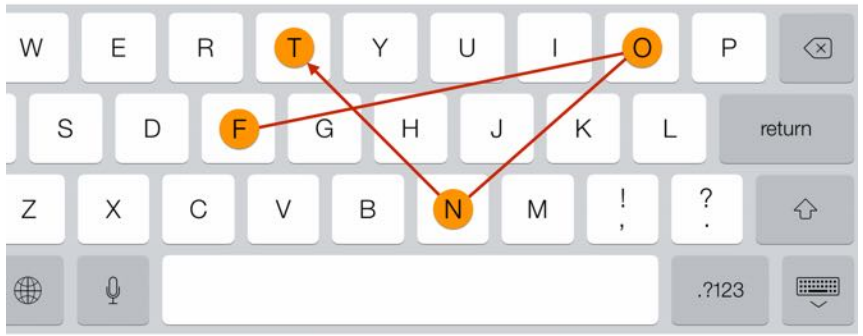
CDT: Data Collection ➔ New input space



CDT: Data Collection ➔ New input space

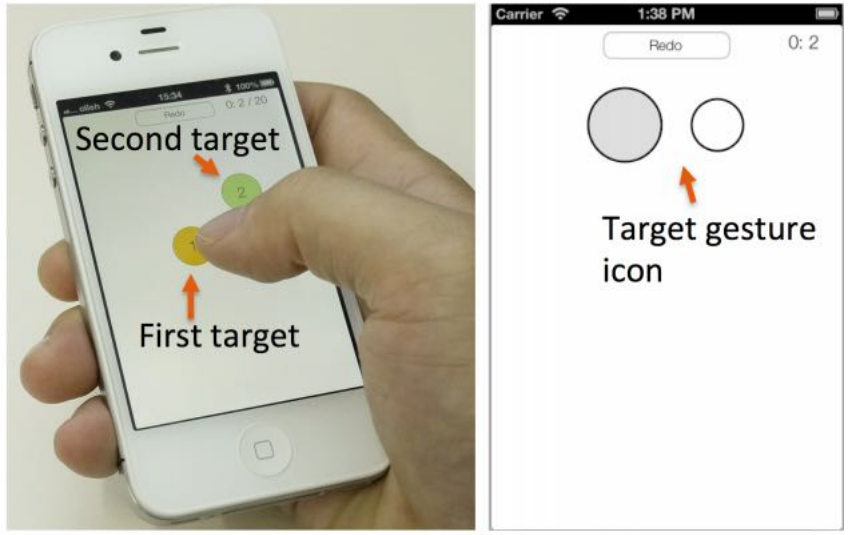






CDT: Evaluation 1

- **Goal:** understand the feasibility of a new gesture, Ta-Tap
- **Method**
  - A lab study with participants
  - Performing double tap and Ta-Tap gestures following the instruction on a smartphone



CDT: Evaluation 1

- **Results:** quantitative performance statistics
- Robust (99.6%) and easy to perform gesture

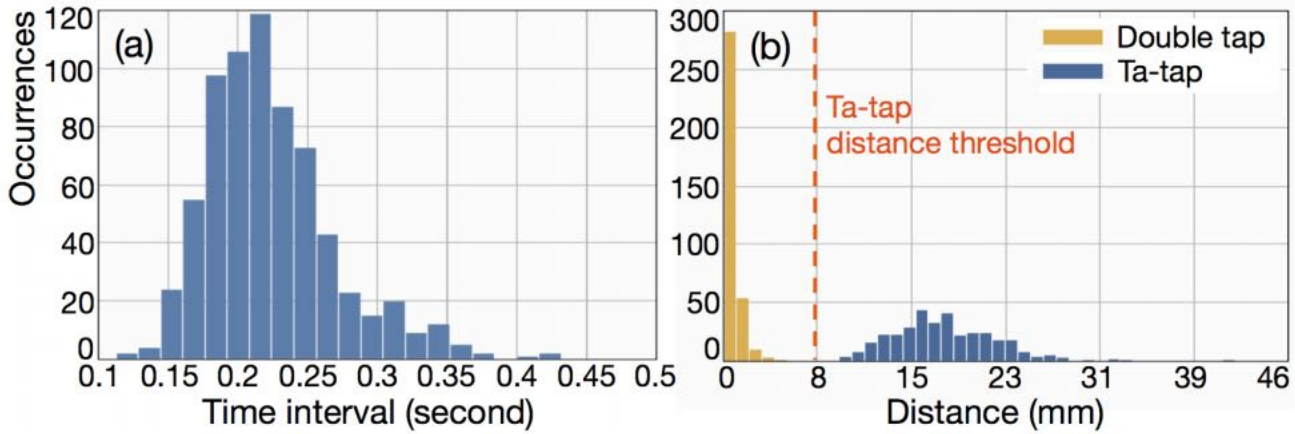


Figure 6. Histograms of (a) time intervals between two taps from the first task and (b) distances between two taps from the second task

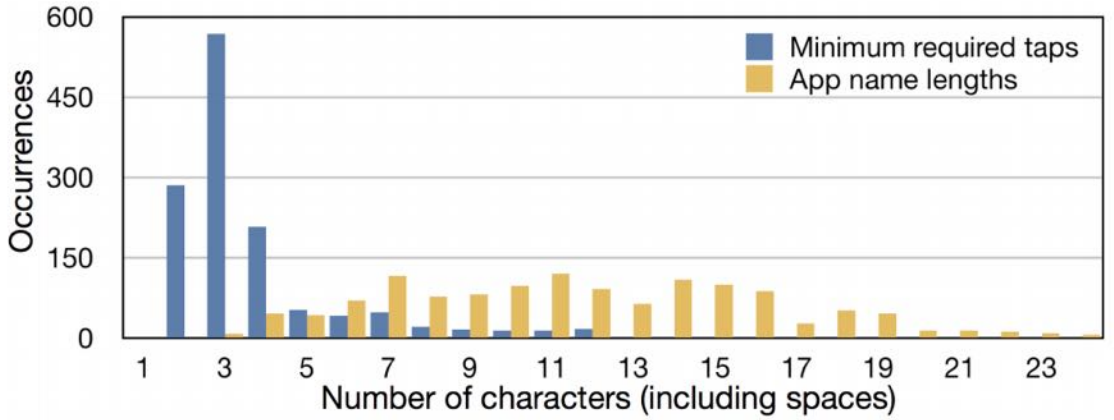
CDT: Evaluation 2

- **Goal:** understand the feasibility of another gesture, Ta-Ta-Tap
- **Method**
  - A lab study with participants
  - Typing words displayed on the screen without seeing the virtual keyboard
  - On an iPad, iPhone, using two thumbs and all fingers

CDT: Evaluation 2

- **Results:** performance characteristics

Number of Candidates	1	2	3
Tablet, Two thumbs	98.6%	99.6%	99.6%
Tablet, All fingers	98.0%	98.4%	98.8%
Phone, Two thumbs	98.4%	99.1%	99.4%

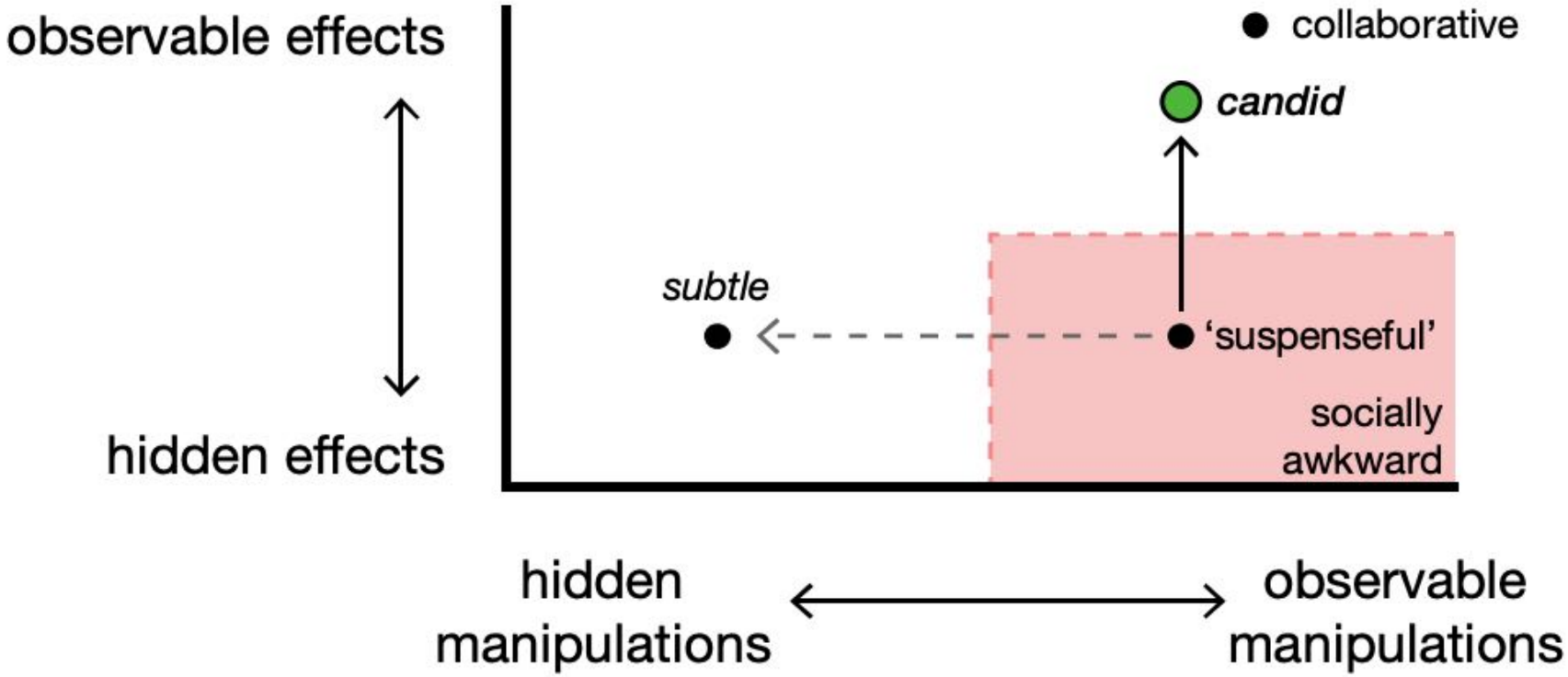


Candid Interaction

- **Goal:** design a new type of interaction that provides awareness about use of technology with others
- **Two user studies**
  - **Formative survey:** understanding people's perception on technology use of others
  - **Preliminary Evaluation:** get initial feedback on how people perceive the new interface

Ens, B., Grossman, T., Anderson, F., Matejka, J., & Fitzmaurice, G. Candid interaction: Revealing hidden mobile and wearable computing activities. UIST 2015

Candid Interaction



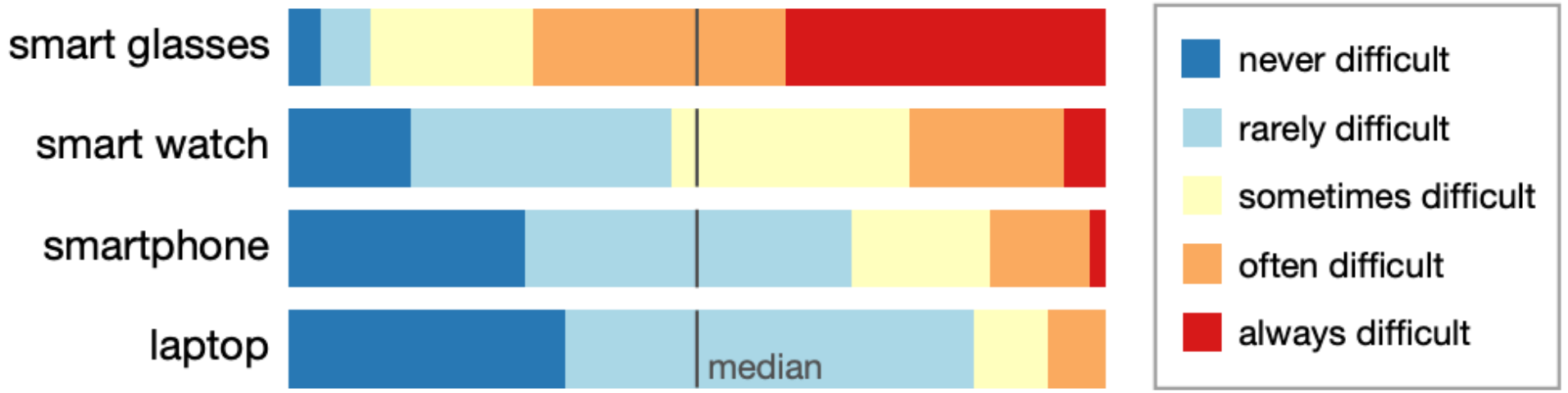
Ens, B., Grossman, T., Anderson, F., Matejka, J., & Fitzmaurice, G.
Candid interaction: Revealing hidden mobile and wearable computing activities. UIST 2015

Candid Interaction: Formative Study

- **Goal:** understanding how people share information and gauge people's willingness to share information
- **Method**
  - Online survey with 100 Mechanical Turks
  - Asked questions about their experiences on determining device activities, attitudes about device usage, and willingness to share

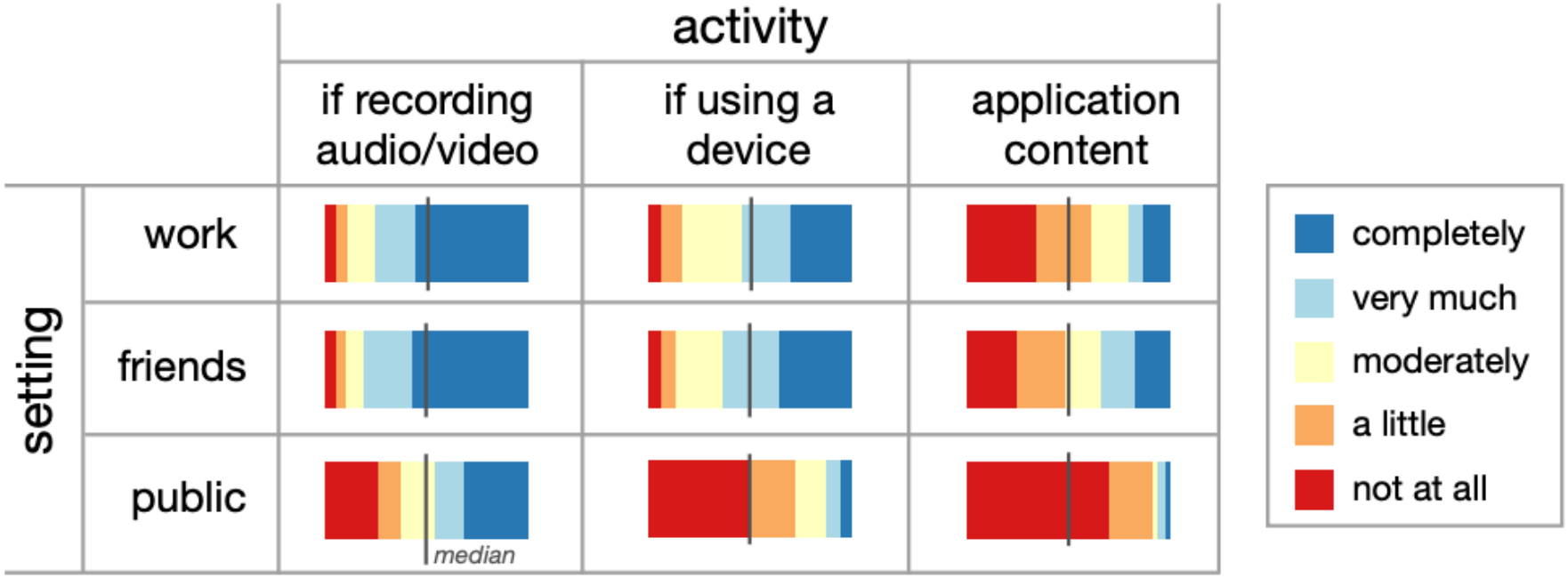
Candid Interaction: Formative Study

- **Results:** survey results with explanations

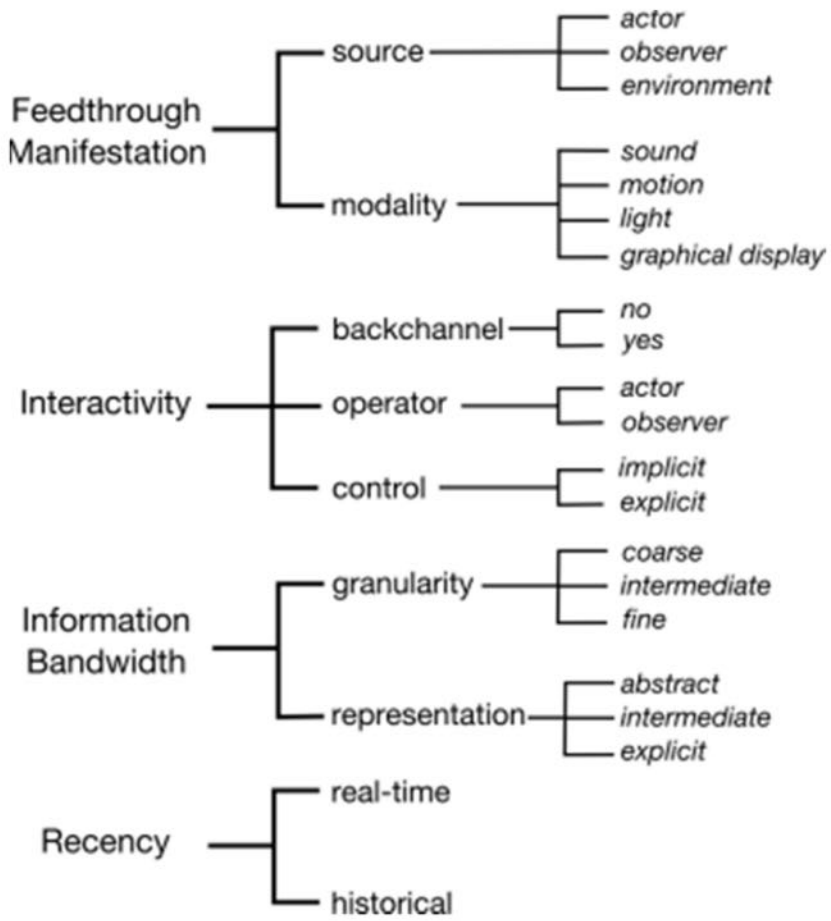


Candid Interaction: Formative Study

- **Results:** survey results with explanations



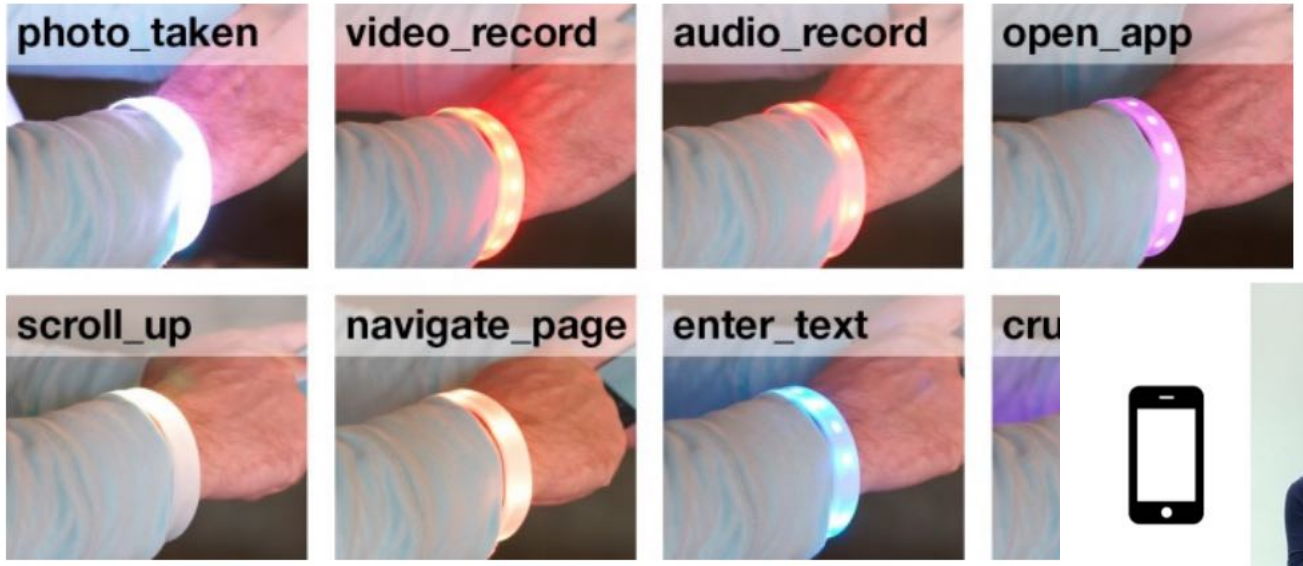
Candid Interaction Technique

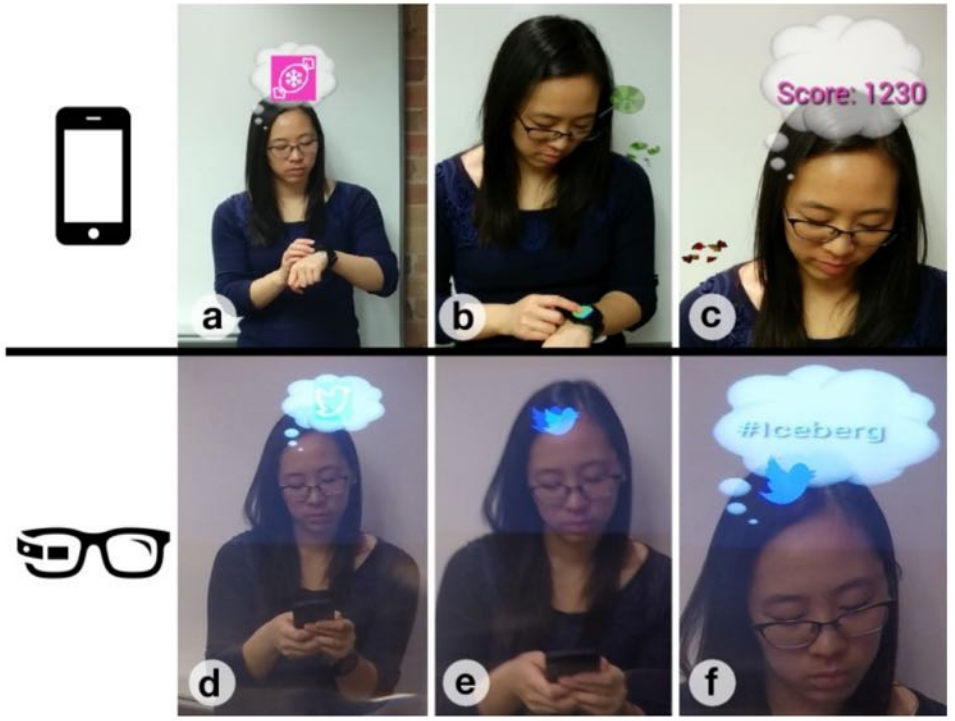


Design space for Candid Interaction

Candid Interaction Technique

Candid Interaction Technique





Candid Interaction: Preliminary Evaluation

- **Goal:** gain initial subjective feedback to understand what people feel about Candid Interaction
- **Method**
  - Group interviews (2 in each group)
  - Asked them to try prototypes and freely give comments about their thoughts on the concept of candid interaction and possible considerations

Candid Interaction: Preliminary Evaluation

- **Results:** people's perception on candid interaction

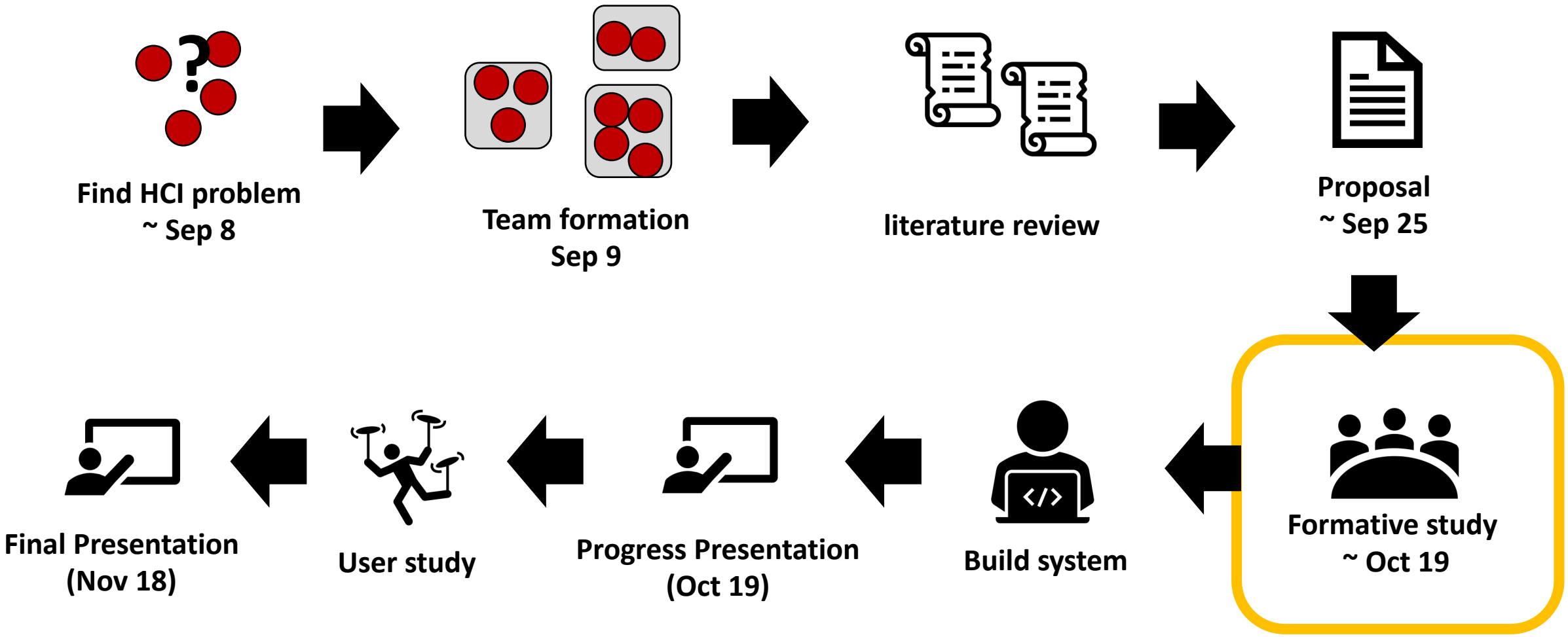
> Participants were generally open to the concept of candid interaction and commented positively on the wide variety of concepts we presented. The Semantic Focus prototype was among the most popular, perhaps due do familiarity with existing tools, as participants remarked it is "useful for collaboration". Similarly, participants thought the Status Band would be "socially acceptable" because it resembles items that people typically wear, although with some exceptions ("some men don't wear jewellery"). Some were unnerved by the unexpected motion of the Iconic Jewellery, however, one participant preferred it to the flashing lights of the wristband. The Fog Hat was also deemed potentially socially awkward, likely due in part to its large form factor.

Candid Interaction: Preliminary Evaluation

- **Results:** people's perception on candid interaction

Participants noted understanding of the need to balance the benefits of sharing with the desire for privacy. For instance, sharing usage information can potentially "dissolve discomfort about using devices" around others. However, it must be used judiciously to prevent "information overload". In alignment with our survey results (Figure 5), participants expressed greatest interest in sharing with friends or coworkers and would often choose to share only minimal detail about their activities. Some noted they would prefer to keep tabs on what is was being shared and suggested features such as explicit detail in the Feedthrough Filter settings or real-time controls to manually initiate sharing.

Course Project: Timeline



Assignment #2: Formative Study

- Conduct an Interview or a Focus Group
- Find an interview topic that's related to your project.
- Team effort, team report
- 2+ interview sessions or a focus group with 4+ participants.
- Report should include:
  - Interview design
  - Interview results (summary and insights)
  - Your reflections on the interview

Due Oct 19 (Mon) 23:59 pm

Assignment instruction will be on the course webpage

Thank you!