

# Flower-Pop

## Facilitating Casual Group Conversations With Multiple Mobile Devices

Moon-Hwan Lee (Korea Polytechnic University)  
Yea-Kyung Row, Oosung Son, Uichin Lee, **Jaejeung Kim**, Jungi Jeong, Seungryoul Maeng, Tek-Jin Nam (KAIST)

# Casual Group Conversation



- A relaxed conversation
- Discloses personal information
- Builds up intimacy among members

# Casual Group Conversation



- More prominent in East-Asian cultures

→ Diverse **sociocultural background** contributes to these difficulties

# Conversation Facilitators



Can mobile phones facilitate conversations like a skilled human facilitator?

# Research Aim



- ① Impact of a mobile system's passive & active conversation facilitation
- ② Sociocultural aspects that affect casual group conversations

Explore potential roles that mobile systems can play in casual group conversations

# RELATED WORK

## RELATED WORK

### Technology-Mediated Solutions

#### *Conversation Visualization*



Table Talk Enhancer  
[Ogawa et al., CEA'12]

#### *Photo (Content) Sharing*



TableTalk  
[Ferdous et al., Ubicomp'16]

## RELATED WORK

### Technology-Mediated Solutions

		Role of Technology-mediated Conversation System
		Passive Orientation ← ----- → Active Orientation
Features	Conversation Visualization	Communication Monitor Ex) Talk Enhancer [42], Meeting Mediator [29]
	Photo Sharing	Content Sharing Channel Ex) MobiComics [32]  Random Content Sharing Ex) TableTalk [16] , 4Photos [41]

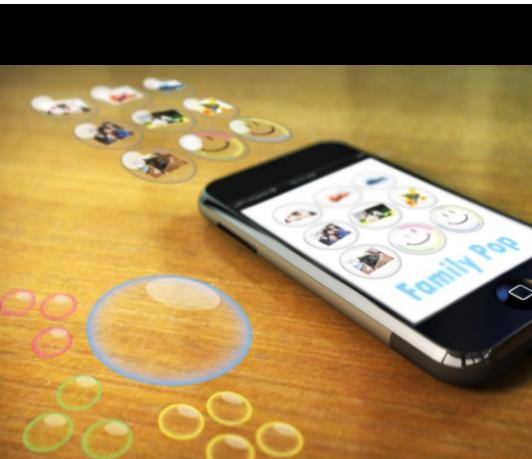
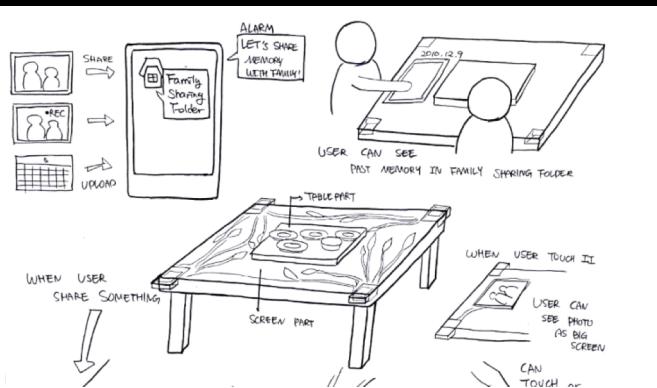
Toward the design of mobile systems  
that *proactively intervene* to facilitate casual group conversations

# **DESIGN OF FLOWER-POP**

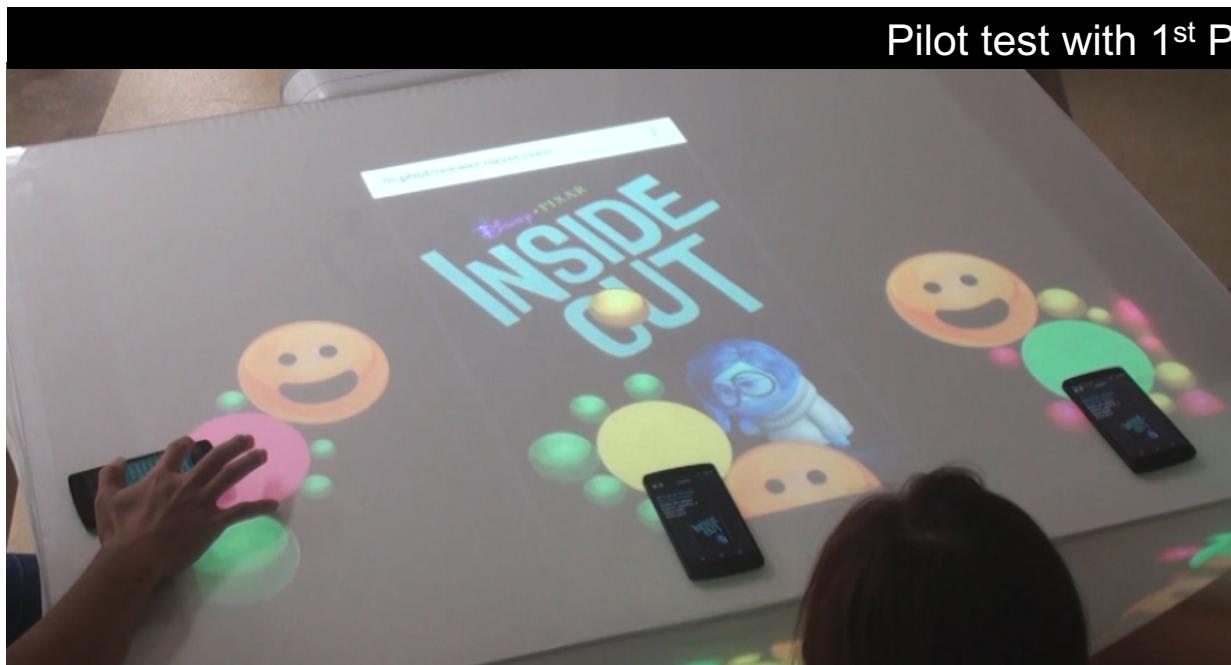
## DESIGN OF FLOWER-POP

# Flower-Pop's Initial Design and a Pilot Test

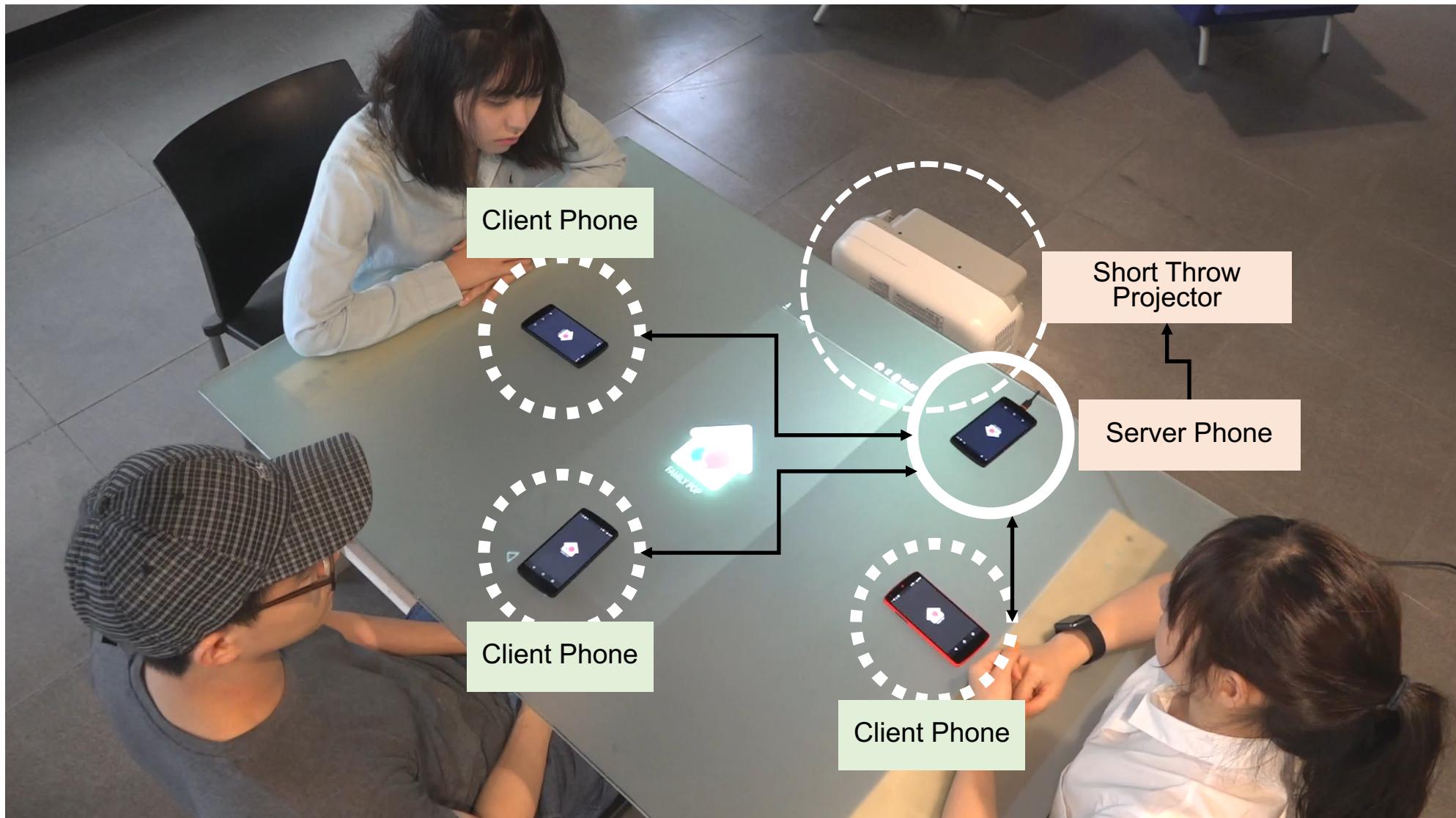
Sketch



Pilot test with 1<sup>st</sup> Prototype



# System Configuration and Architecture



## DESIGN OF FLOWER-POP

### Flower-Pop's Final Design

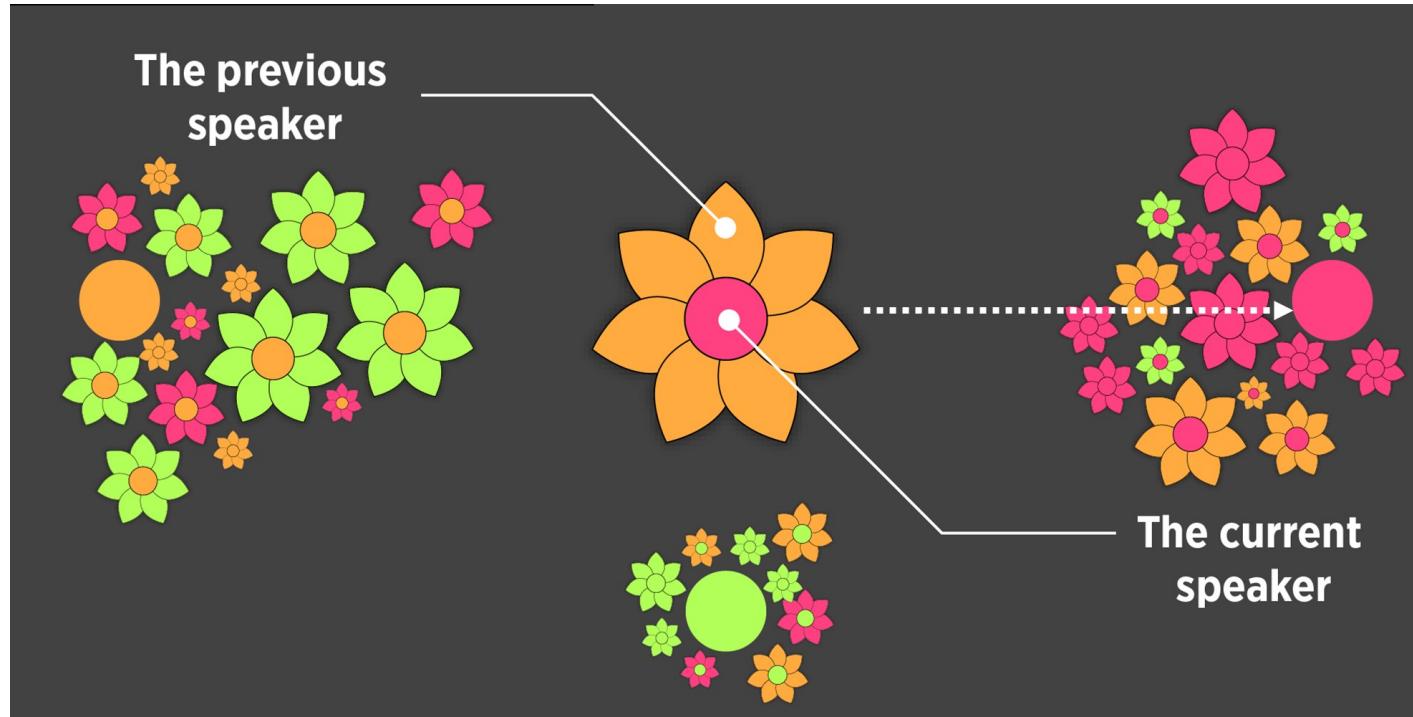
#### *Monitoring and Visualizing Group Conversations*

		Role of Flower-Pop		
		Passive Orientation	← ----- →	Active Orientation
Features	Conversation Visualizing	Supporting User's to Send 'Like' Flower	Creating 'Talk' & 'Laughter' Flowers	Encourage Participation by 'Bee'
	Photo Sharing	Supporting User's Spontaneous Sharing	Supporting Random Photo Sharing	Encouraging Photo Sharing Potential Area

## DESIGN OF FLOWER-POP

### Flower-Pop's Final Design

#### *Conversation direction & duration visualization*

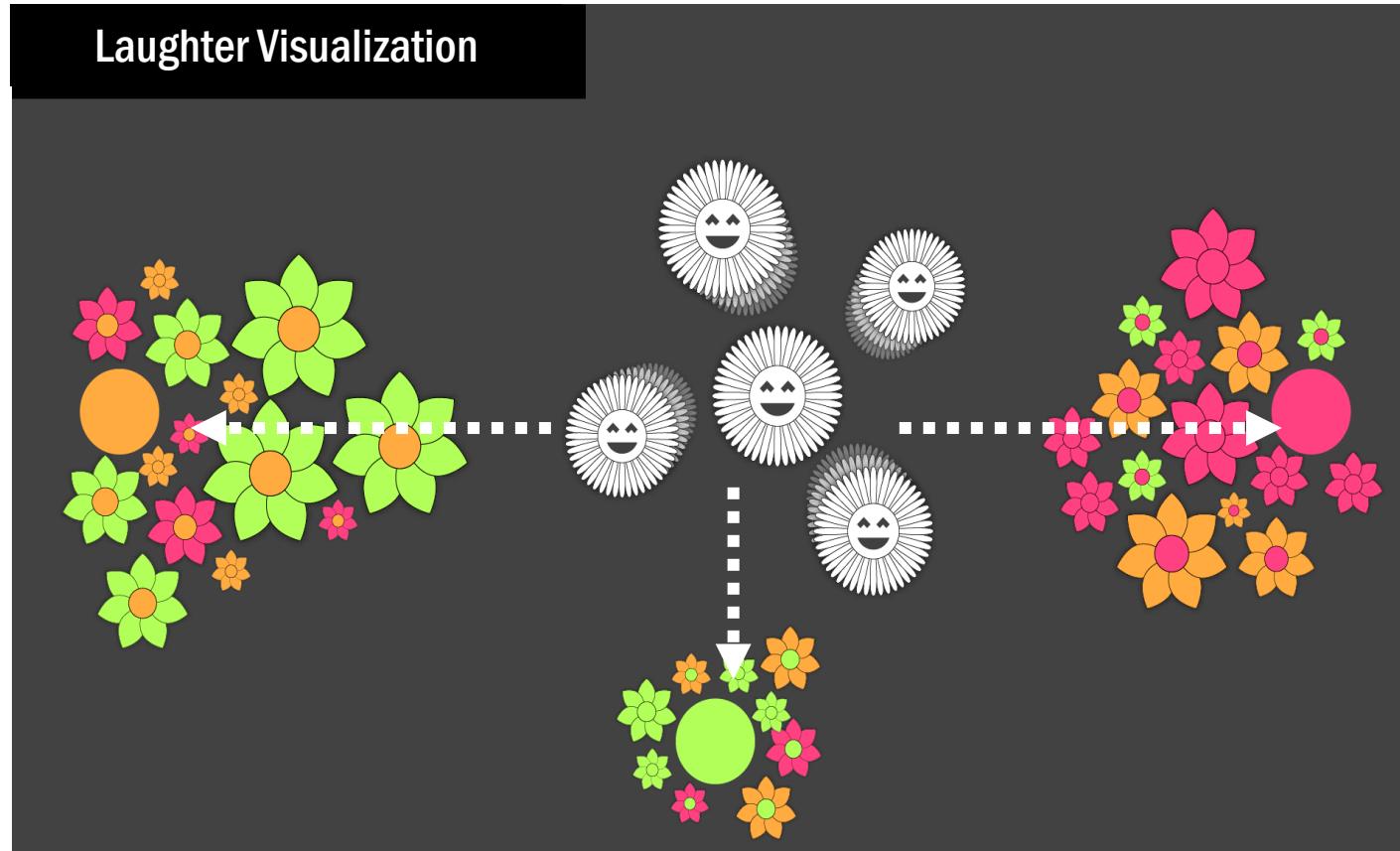


- Color = speaker & direction
- Size = duration of utterance

*Ex. Pink Person responded to Orange Person*

## Flower-Pop's Final Design

### *Group laughter visualization*

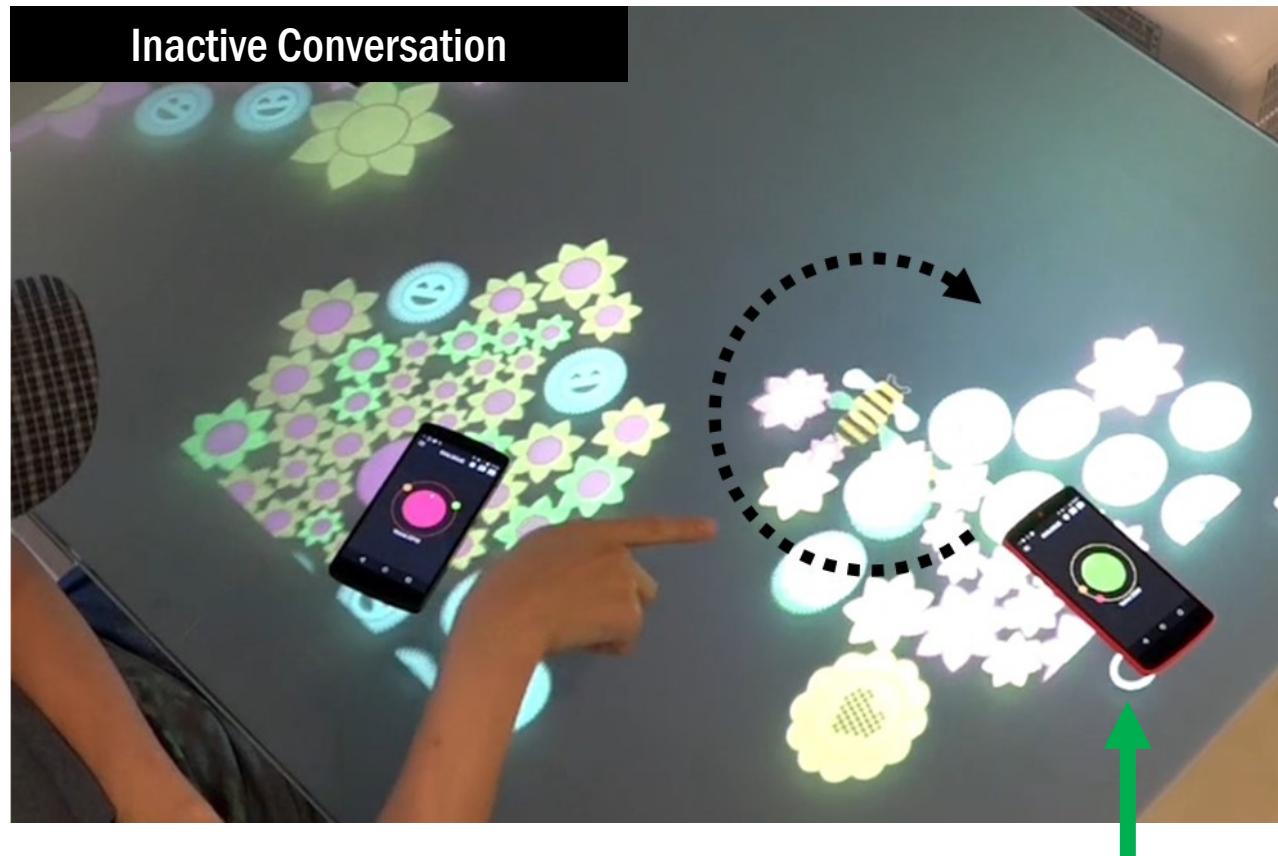


Ex. Group members *laughed* together

- Laughter detection
- 'Laughter' flower is sent to all participants

## Flower-Pop's Final Design

### *Inactive conversation detection and notification*

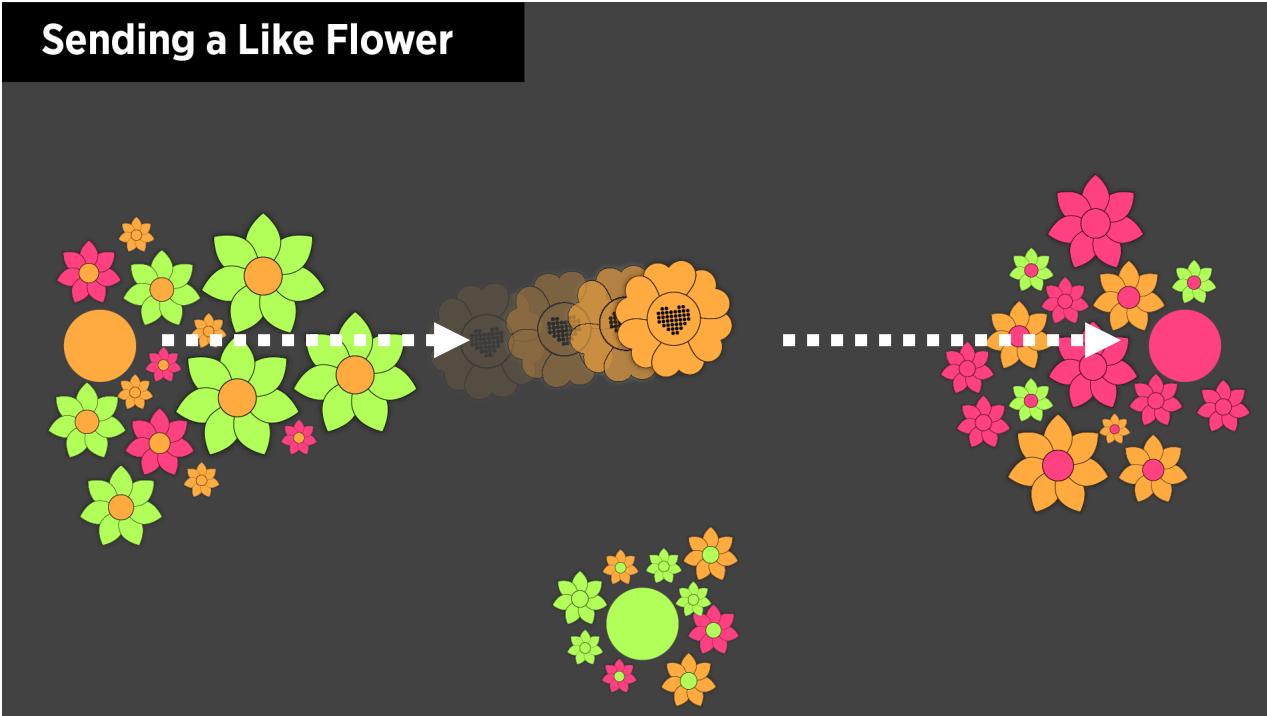


*Ex. Bee flies around the least active speaker's smartphone  
(green user)*

- Recognition of low participation
- Actively induces the member to talk more with a 'bee' flying around the member's phone

## Flower-Pop's Final Design

*"Like Flower" as a positive expression toward a speaker*



- Users can intentionally express their reactions
- Send 'Like' Flower as a sympathetic expression



## DESIGN OF FLOWER-POP

### Flower-Pop's Final Design

#### *Moderating Photo Sharing*

Role of Flower-Pop				
	Passive Orientation			Active Orientation
Features	Conversation Visualizing	Supporting User's to Send 'Like' Flower	Creating 'Talk' & 'Laughter' Flowers	Encourage Participation by 'Bee'
	Photo Sharing	Spontaneous Sharing	Random-forced Sharing	Encouraged Sharing

## Flower-Pop's Final Design

### *Moderating Photo Sharing*



*User selects a photo*



*Selected photo is displayed*

- Users select photos and share whenever they want
- System's role is limited to acting as a channel for sharing photos

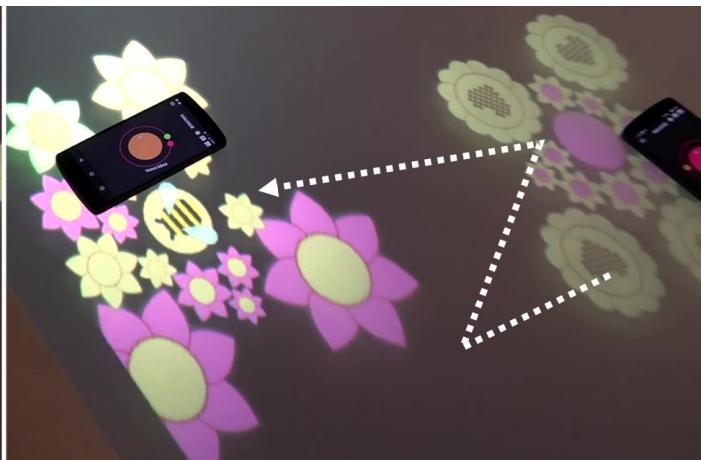
## Flower-Pop's Final Design

### *Moderating Photo Sharing*

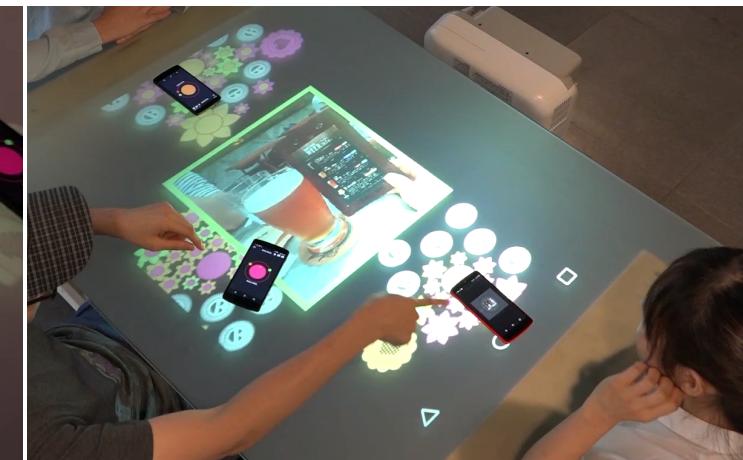
#### **Random-forced Sharing**



*User starts random-forced sharing mode*



*Bee moves among users*



*When the bee stops, the system discloses the user's photo automatically*

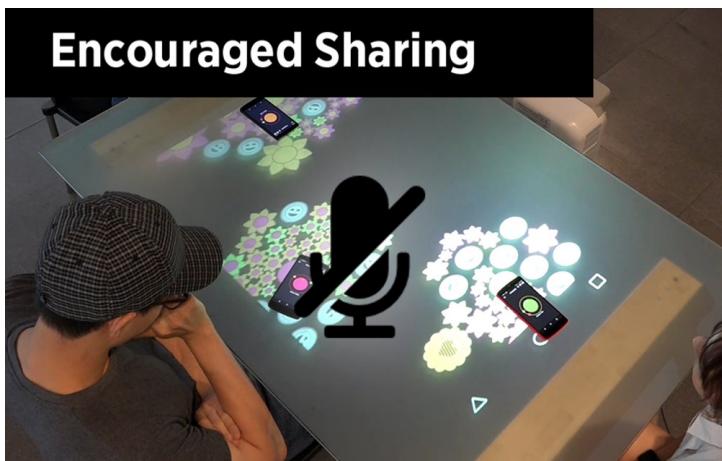
- If a user press a button in the app, the bee stops at a random user's location, and the system discloses a random photo from that user automatically
- Users cannot determine the type of photo or decide whether it will be shared

## DESIGN OF FLOWER-POP

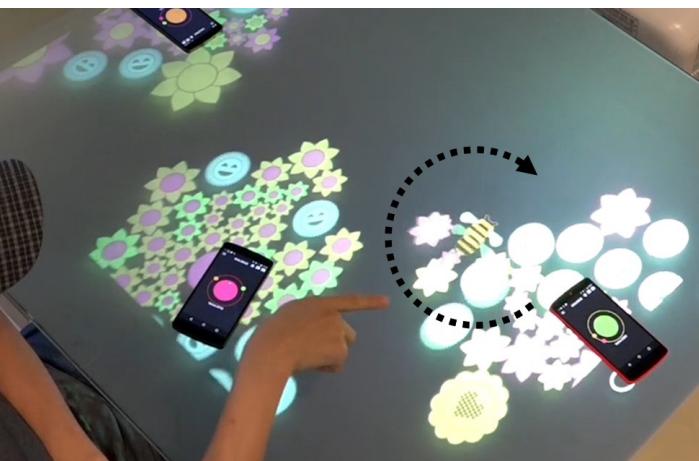
# Flower-Pop's Final Design

### *Moderating Photo Sharing*

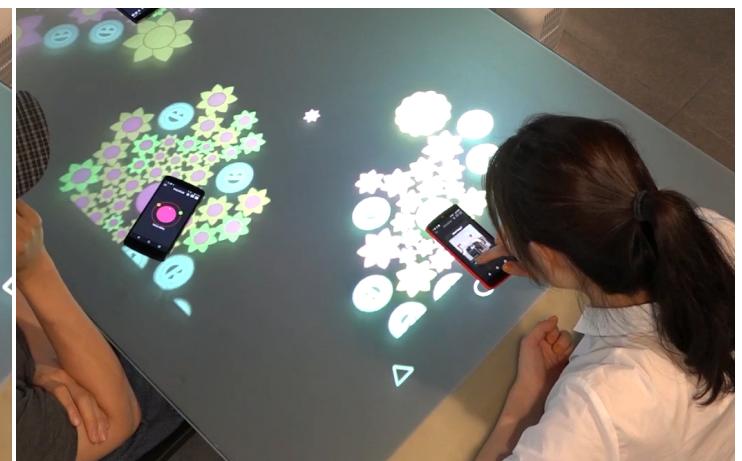
#### Encouraged Sharing



*System detects silent moments automatically*



*Bee flies around the least active speaker's icons*



*System asks if the speaker wants to share one of his/her random photos*

- System detects the least active speaker, and ask if the person wants to share a photo or not
- Flower-pop facilitates conversation by monitor conversation patterns and by proactively encouraging photo sharing

# Interactions

# FIELD STUDY

## FIELD STUDY

# Participants

Group Number	Group Description	Duration of Relationship as a Group
Group 1	A group of friends having a common friend (G1-M1 was a friend of G1-M2 and G1-M3, separately)	2 months
Group 2	Newly formed study group members (G2-M1 was a mentor for G2-M2 and G2-M3)	3 months
Group 3	Newly formed study group members (G3-M1 was a senior mentor of G3-M1 and G3-F1)	1 week
Group 4	Newly joined social club members (G4-M1, G4-M2, and G4-M3)	3 months
Group 5	Lab members (G5-M1 and G5-M2), including a newcomer (G5-F1)	2 months
Group 6	Social club members (G6-F1 and G6-F2), including a newcomer (G6-M1)	2 months
Group 7	Lab members (G7-M1 and G7-M2), including a newcomer (G7-F1)	1 week

- 7 groups (3 people in a group)
- Early stage of its social relationship (Avg = 1.8 month)

## Study Setup

### *Study Procedure*

- Each participants prepared potential photos to be shared
- Each group experienced the system 2 times
  - 30 min group conversations
  - + 30 min group interview



# FINDINGS & DISCUSSION

## FINDINGS & DISCUSSION

### Indirect Supports of Visualizations



#### Increased understanding of conversation patterns

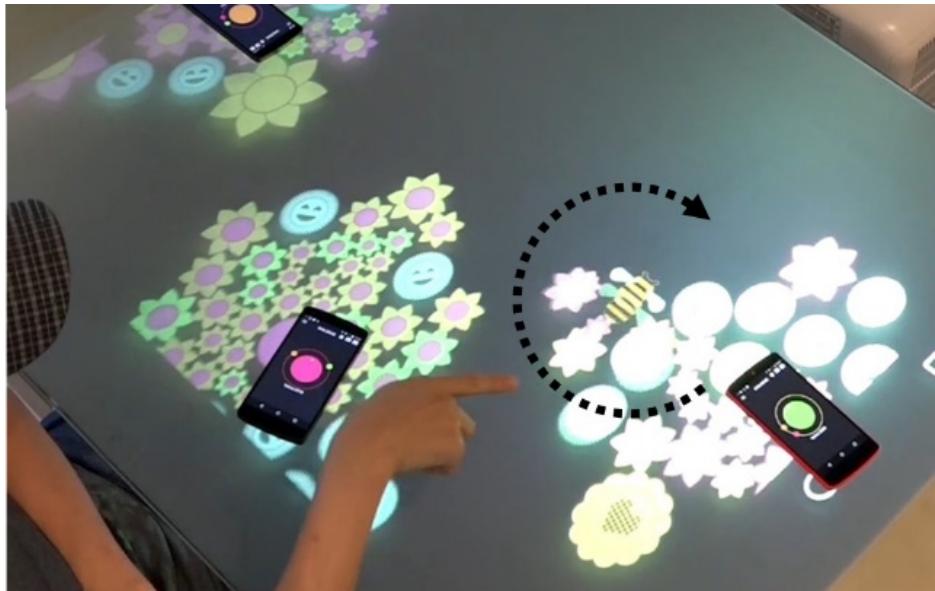
*“A lot of flowers with petals and stamen of the same color led me to reflect on whether I talk too much” (G6-F1, week 2)*

#### Supported a feeling of bond development among members

*“When the laughing flowers were appearing, I felt the confirmation that our conversation was going well” (Week 2)*

## FINDINGS & DISCUSSION

### Direct Supports of Conversation Encouragement



Bee flies around the least active speaker's phone.

#### Direct impact on the target was limited

*"I saw the bee around me, but I hesitated a bit. Since other members were speaking, I just neglected the bee"*  
(G1-M1, week 2)

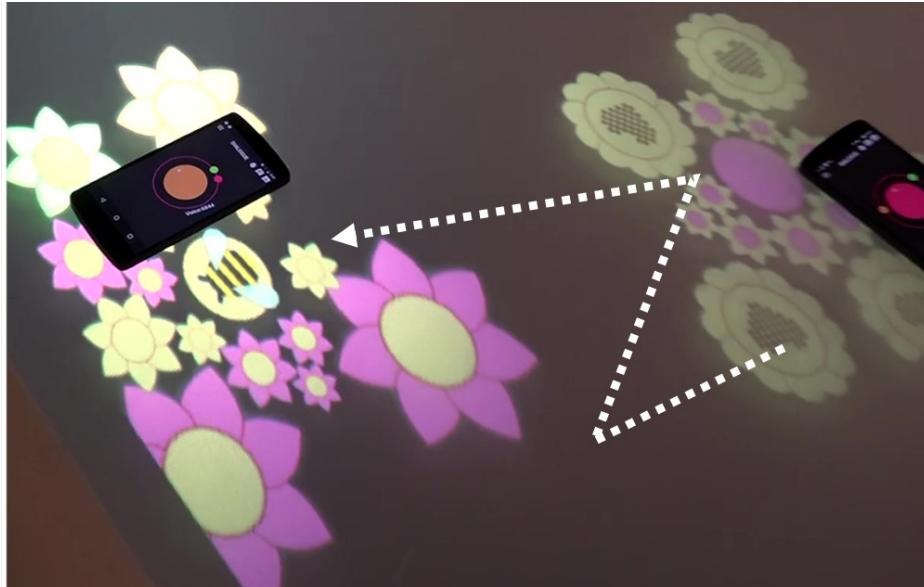
#### Resistance to the semi-mandatory suggestions

*"Do we need to rely on this system?"* (G4-M2, week 2)

#### Indirect impact via other group member was effective

*"Oh, the bee appeared! This time, it seems to be your turn to speak"* (G5-M1, week 2)

## Random-Forced Sharing: Interrupting but Accepting



*Bee lands on one of the participant,  
a random photo is shared*

### Positive impact

- **Acceptance** of the presenter-listener role
- **Broadened the topic** beyond social relations

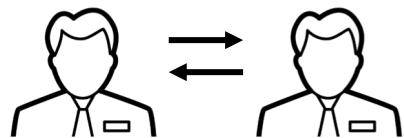
### Negative impact

- In some cases **interrupted conversation**
- Some worried about **privacy and social face**

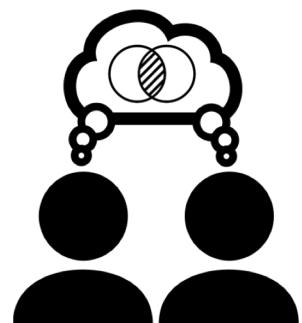
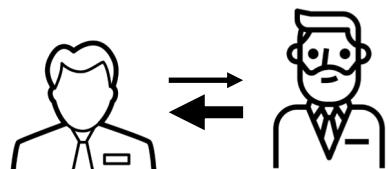
## Sociocultural Influences on Casual Group Conversation with Flower-Pop



Need for saving face in a public space



Need for adaptive facilitation according to social relations



Need for understanding group's common interests(what) and dynamic emotional changes(when/how) during the conversation

# Q&A

## Flower-Pop

Facilitating Casual Group Conversations With Multiple Mobile Devices

Moon-Hwan Lee (Korea Polytechnic University)

Yea-Kyung Row, Oosung Son, Uichin Lee, Jaejeung Kim, Jungi Jeong, Seungryoul Maeng,  
Tek-Jin Nam (KAIST)



## Sociocultural Influences on Casual Group Conversation with Flower-Pop

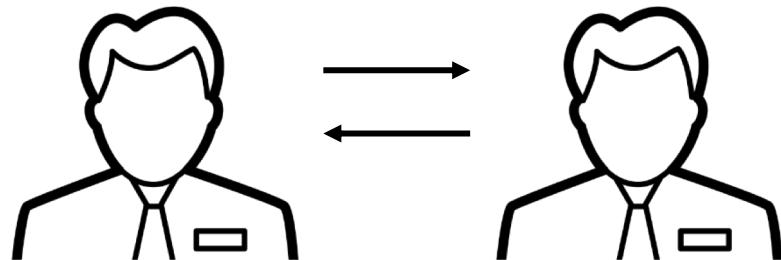
### *Saving Face in a Public Space*



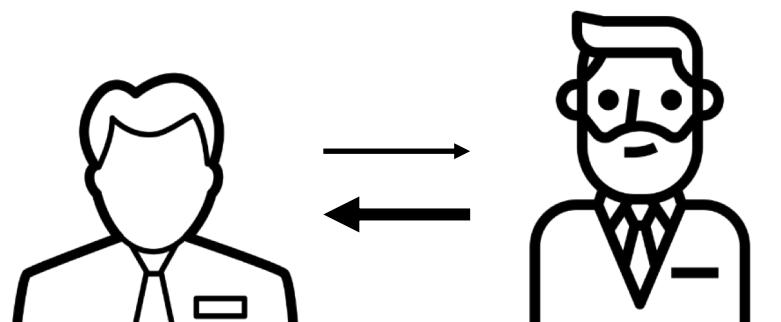
- Because the system was too visible in public, it attracted the attention of unrelated people,
- Worried that the Flower-Pop could select private or rude pictures
- Need to maintain the social faces of group members by monitoring the types of materials that are to be shared

## Sociocultural Influences on Casual Group Conversation with Flower-Pop

### *Seeking Proper Photos and Chances of Speaking According to Social Relations*



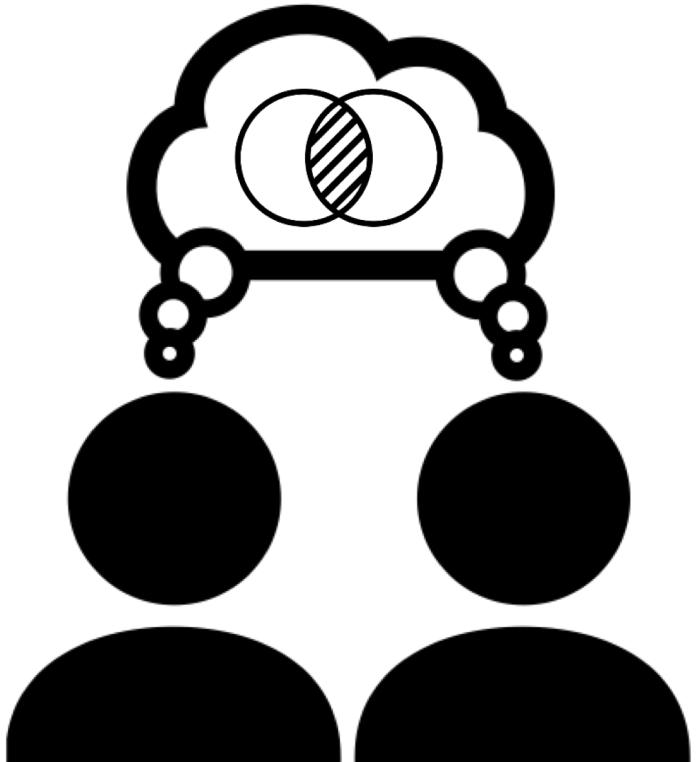
- In same age group, the new comer easily talk about personal stories and cut off one another's conversation.



- Under a senior-junior relationship,
  - Senior participants tended to take the initiative in sharing photos and suggesting subject matters, while juniors listened attentively to the senior members.

## Sociocultural Influences on Casual Group Conversation with Flower-Pop

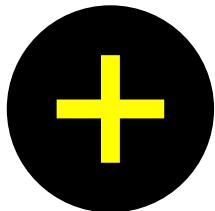
### *Being Conscious of Emotional Status and Levels of Attention to Ensure Group Harmony*



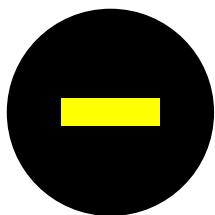
- At the beginning of the experiment, participants hesitated when deciding what type of photos should be shared because they could not figure out what would interest other members.
- As they gradually began to understand each other's interest, they were able to identify **group's common interests and suggest appropriate topics and photos.**

## Use of Photo-Based Conversation Facilitation

### *Spontaneous Photo Sharing for Expressing Sympathy*



- Used spontaneous photo sharing to relate others' narrative to their own personal experience and to show **sympathy**
- Shared different photos of participants about related topics, which **enriched the conversation**

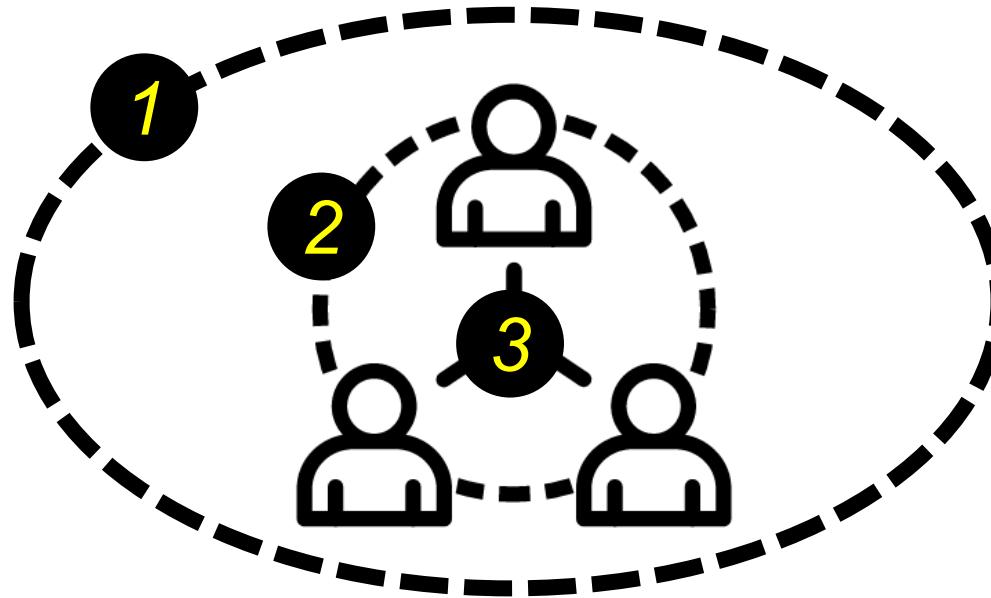
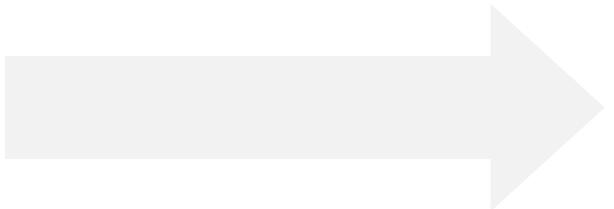
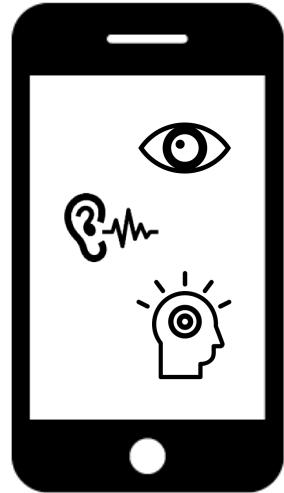


- Difficulties in spontaneously selecting photos
  - **Topics changed frequently**, thus it was difficult to catch the right timing for sharing a photo
  - *"I had a relevant photo. But the right timing was already gone to share one of my photos"* (G5-M1, week 1)

# DISCUSSION

## DISCUSSION

# Research Issues in Utilizing Mobile Systems as Conversation Facilitators



- 1 *Consideration of Environmental Characteristics*
- 2 *Consideration of Social Relationship*
- 3 *Consideration on Audience's Emotional Status and Interest*

## DISCUSSION

# Considerations of Environmental Characteristics

1



- People's current environments influence their social interactions.
- Participants cared about maintaining their social faces in the public space.

## DISCUSSION

# Research Issues in Utilizing Mobile Systems as Conversation Facilitators

## *Consideration of the Characteristics of Places*

Factors to be considered

Place Type

Crowdedness

Typical Activities

*Sensing GPS or WIFI access information*



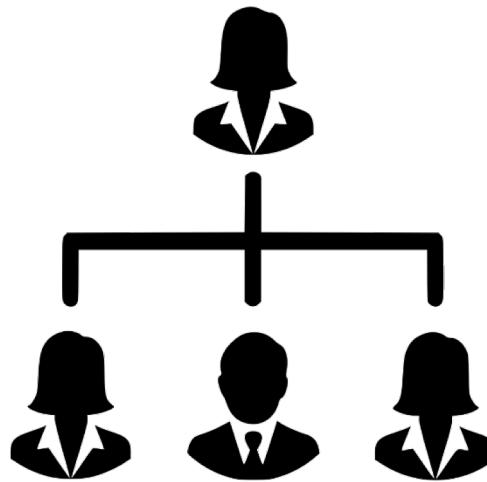
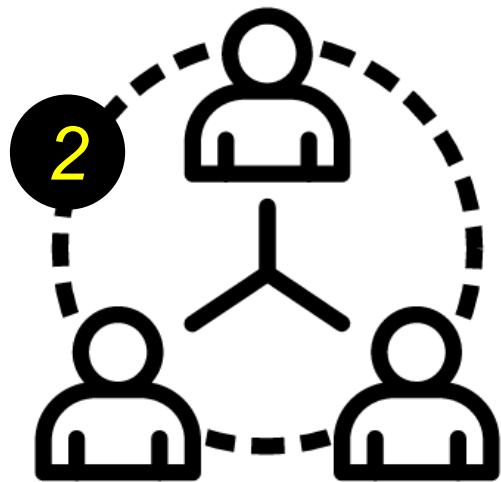
*Detect the Characteristics of Places*

- *Ex. In the private space, visualization is made clearer and more evident*
- *Ex. In the public space, visualization is made abstract. System carefully filter inappropriate contents of photos.*

## DISCUSSION

# Research Issues in Utilizing Mobile Systems as Conversation Facilitators

### *Consideration of Social Relationship*



- The system should be designed to support diverse methods of social interaction depending on the type of social relationship and the level of intimacy.

## DISCUSSION

# Research Issues in Utilizing Mobile Systems as Conversation Facilitators

### *Consideration of Social Relationship*

Factors to be considered

Type of Social Relationship  
(social hierarchy)

Level of Intimacy

*Ex. Use social networking services to surmise social relationships*



*Ex. Diverse Facilitation Mode:  
Friend-Friend /Child-Parent /With a senior*

- More careful intervention is needed in the presence of groups with age differences, a relationship with a senior etc.

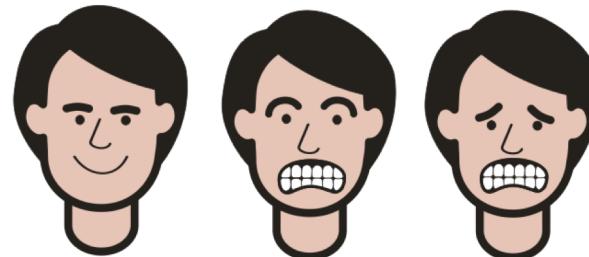
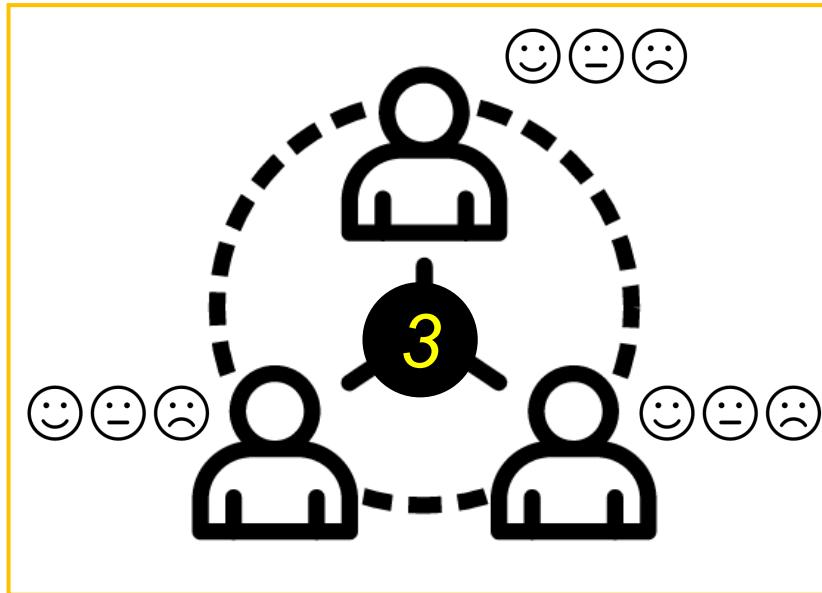
*Ex. The more intimate,  
the more in-depth disclosure is possible*

- As a relationship grows, the system may start to facilitate conversation about more personal items.

## DISCUSSION

# Research Issues in Utilizing Mobile Systems as Conversation Facilitators

### *Consideration on Audience's Emotional Status and Interest*



- In a high-context culture, the method of conversation is important.
- Speakers should be aware of how others react and what their emotional status might be.

## DISCUSSION

# Research Issues in Utilizing Mobile Systems as Conversation Facilitators

## *Consideration on Audience's Emotional Status and Interest*

Factors to be considered

Verbal communication

Detect verbal responses  
(Ex. current conversation topics)

Non-Verbal communication

Detect non-verbal responses  
(Ex. body orientation, proxemics etc.)

*Ex. Deeper group conversation by suggesting relevant photos*

*Ex. Enable the shared photo to fade out when the interest of groups has diminished*

# CONCLUSIONS

## CONCLUSION

### Research Contribution



- Flower-Pop as an exemplar system as a conversation facilitator
- Field trial guides the design of mobile systems toward an intelligent conversation facilitator