

A picture is worth a thousand words

Improving Mobile Messaging with Real-time Autonomous Image Suggestion

**Joon-Gyum Kim, Chia-Wei Wu, Alvin
Chiang, JeongGil Ko, Sung-Ju Lee**



AJOU UNIVERSITY



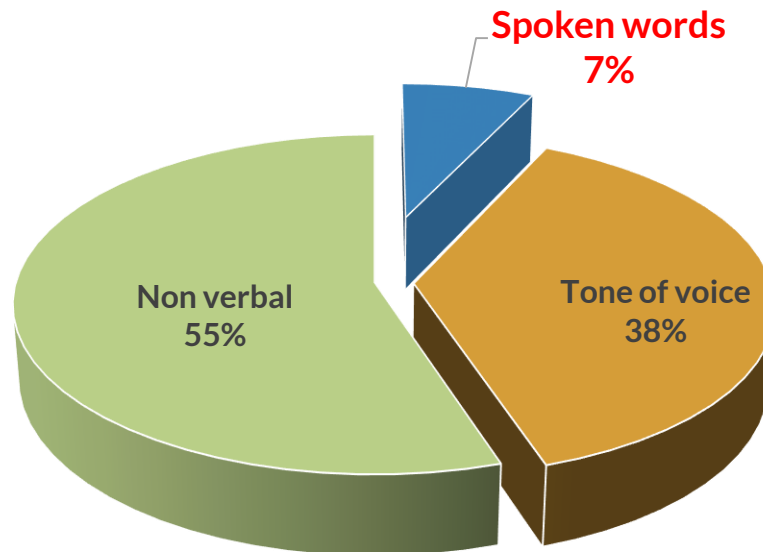
Korea Advanced Institute of
Science and Technology

School of Computing

Text-based chat is difficult

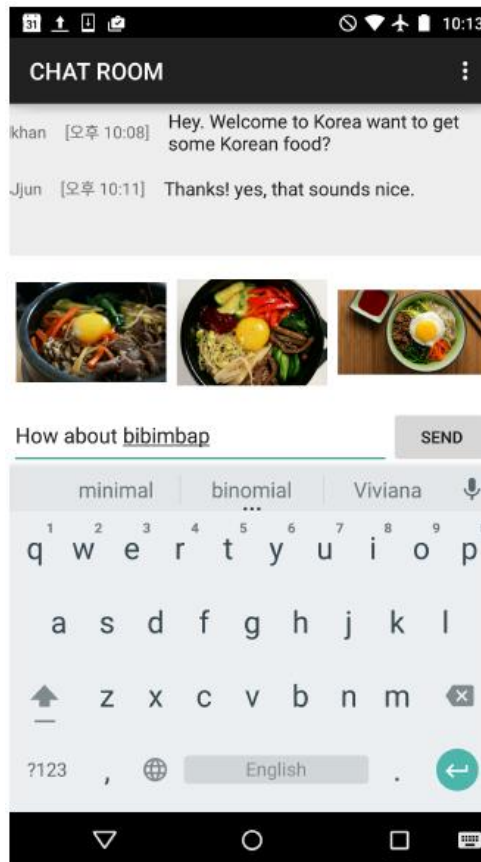
- ▷ Text is only 7% of communication influence factor
- ▷ That's why we use emoticons and images

Communication influence factors



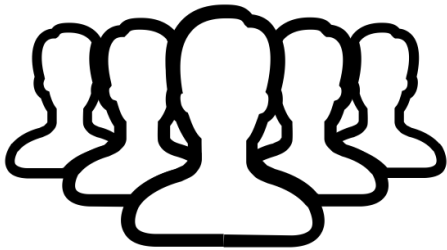
We need assistant

Image auto suggestion based on your chat context

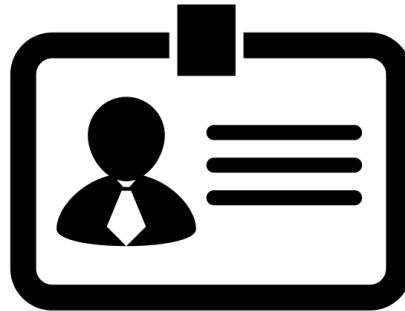


Survey

- ▷ Image usage in chat application
- ▷ Image auto suggestion is useful?



253 Users



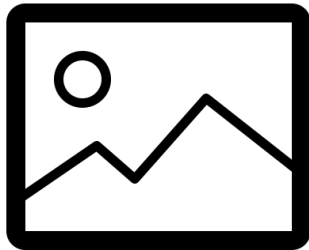
10+ professions



11+ nationality

Survey Results

Using image in mobile chat



90.5%

Image auto suggestion is useful?



82.2%

Survey Results

Image auto suggestion is useful?



17.8%

The people who say no, they write comments

- ▷ **Unintended image suggestion**
- ▷ **Data and energy waste**
- ▷ **Takes long time when connection is slow**

Auto suggestion challenges

1. Timeliness

Image should be suggested when user might intend to use a suggested images

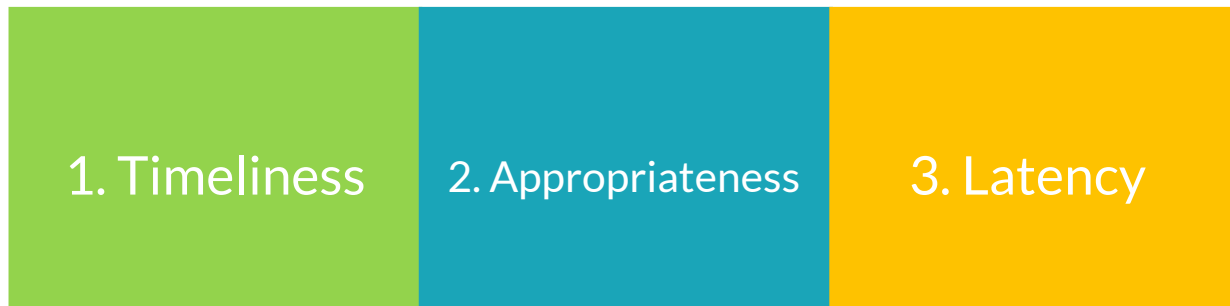
Auto suggestion challenges

1. Timeliness

2. Appropriateness

The suggested images should match the context of the user' conversation

Auto suggestion challenges



Suggested images appear within the short duration

Auto suggestion challenges

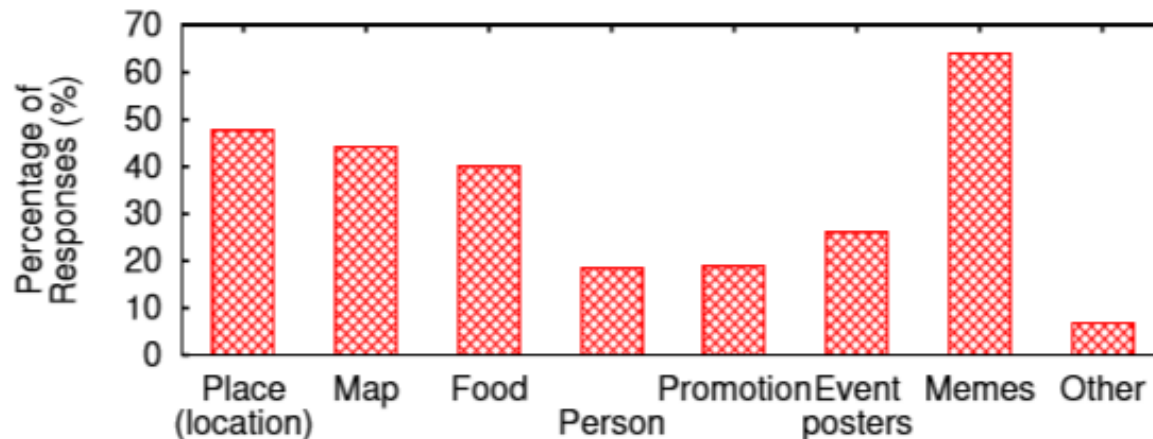


Users are always concerning energy and traffic

Timeliness

- ▷ Catch keyword or sentence proper to be images.
- ▷ Ex) Lexical and semantic ambiguity, nuance delivery, complex word and sentence, map, proper noun and emotions

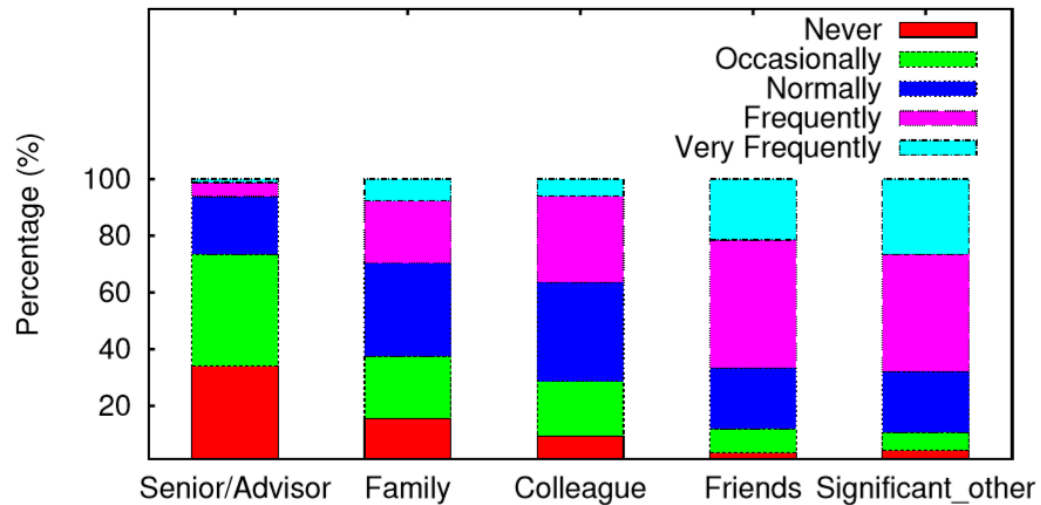
Image preference during mobile chatting (no dominant answer)



Timeliness

- ▷ Consider relationship with chat partner
- ▷ High frequency for comfortable chat partner

Frequency of use image in mobile chat



Appropriateness

- ▷ Aware of current chat context
- ▷ Analyze image using image source information

Cake



Philosophy



Appropriateness

- ▷ Sentiment analysis(Opinion mining) technic is necessary, it analysis chat text and extract opinion
- ▷ Opinion: (**object, feature, sentiment value**, opinion holder, time)

Amazon

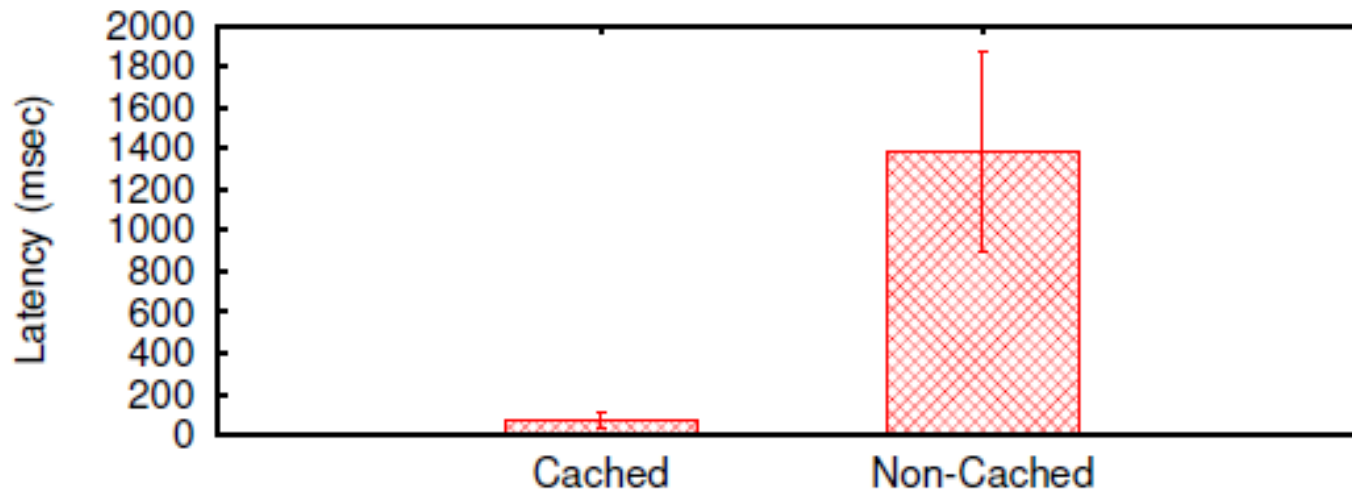
amazon.com[®]



Latency

- ▷ Minimal processing needs for natural language processing
- ▷ Main bottleneck is image providers

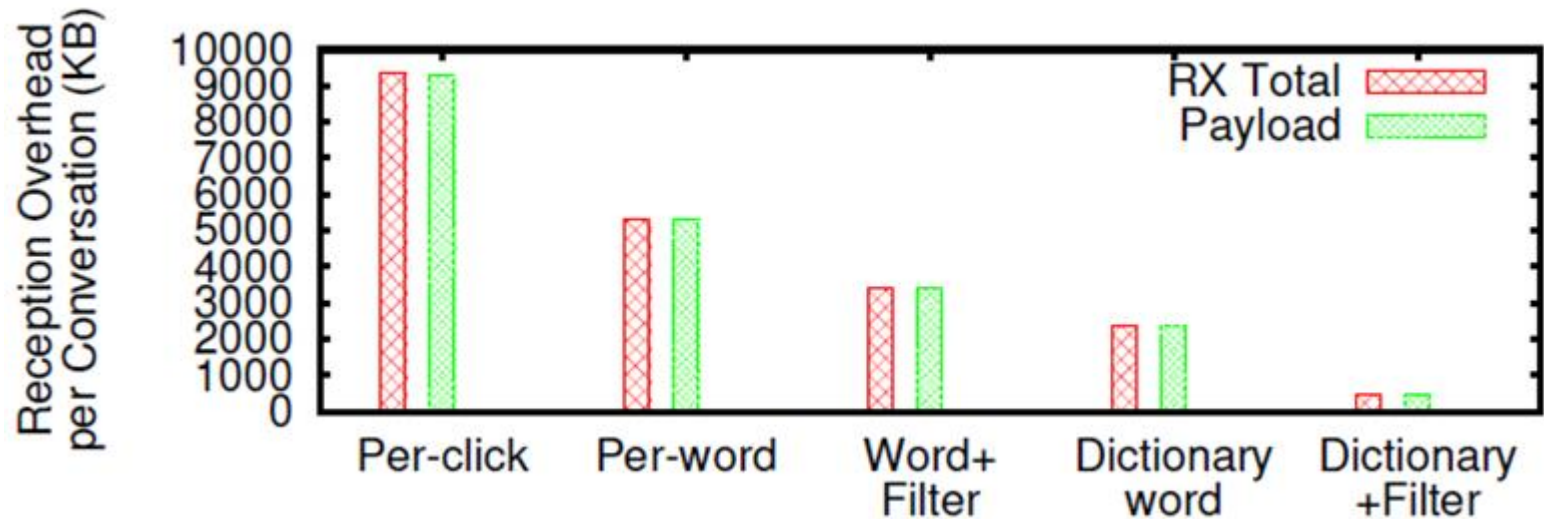
Proxy caching server reduces latency



Resource Efficiency

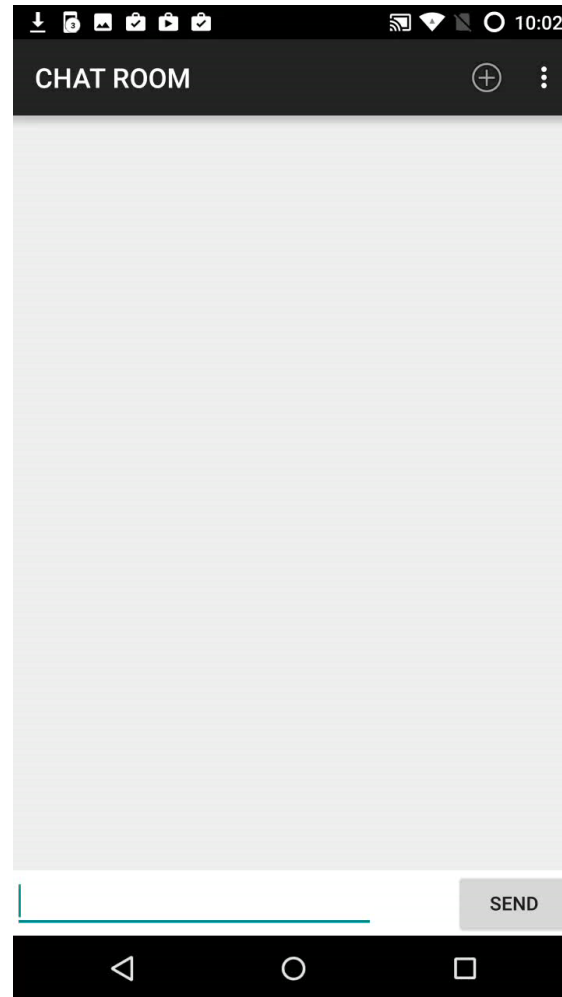
Data and energy consumption

- ▷ Rely on timeliness problem

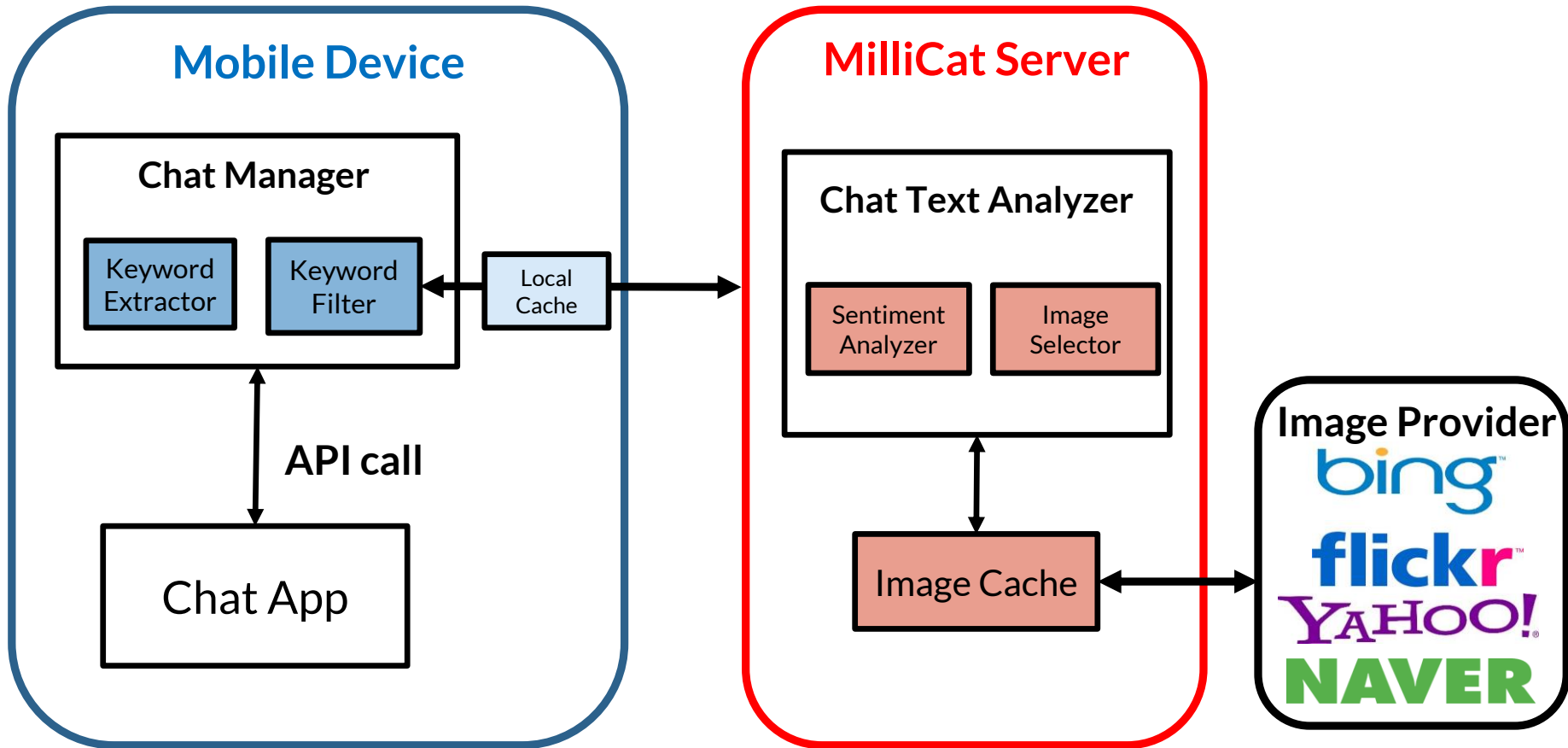


- ▷ Per-click: image request for every user input
- ▷ Per-word: image request for each user input space
- ▷ Filter: no image request for conjunction, pronoun and preposition
- ▷ Dictionary: image request for word exist in dictionary

Prototypes



Architecture



Conclusions

- ▷ Focus on original functionality
“Communication”
- ▷ One of that solution could be image
auto suggestion

Thanks!

Any questions?