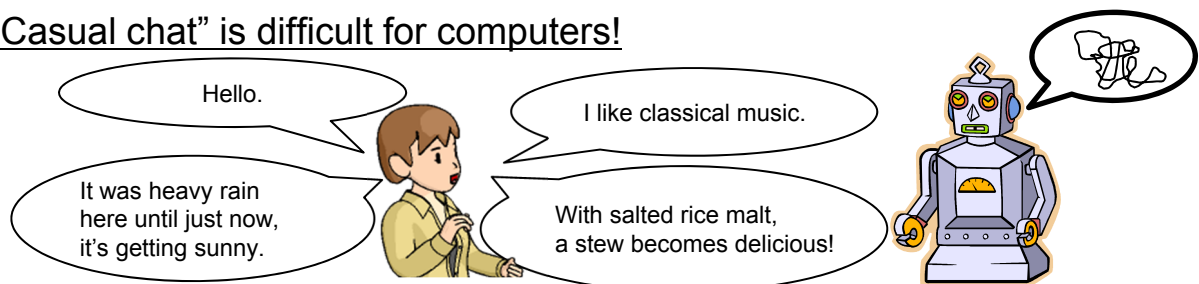


## Abstract

Conversational systems are actively investigated recently, since they are effective not only counseling or entertainment purpose, but also improvement of performance in task-oriented dialogues. Our aim is to develop conversational system that can respond to any kind of topics. To realize appropriateness of utterances and wide range of topic coverage simultaneously, we propose an approach that integrates a rule-based utterance generation method and a statistical method that leverages web sentences to create utterances. Our proposed approach estimates appropriate methods based on concordance rates between user utterances and rules, or word frequencies in web-corpus. Our approach generated more appropriate utterances rather than individual methods.

## “Casual chat” is difficult for computers!



Conversational systems are required to respond to user utterances with various topics.

## Integrates various utterance generation methods

## Rule-based (Hardly generate inappropriate sentences, but topic coverage is narrow)

## User utterances

"I have eaten nothing today, so I'm hungry."  
何も/食べて/なくて/お腹/空/いた/なあ

Rule DB  
(Pair of Pattern→sentence)  
Match pattern  
\* お腹 \* 空い \*  
(\*: Match to arbitrary words)

## System utterances

"It's time for dinner"  
"I will make lasagna today"  
"I got hungry too..."

## Statistics-based (Topic coverage is wide, but include inappropriate sentences)

## user utterance

I want to go to Abeno-Harukas"

## Input semantic units

Abeno-Harukas→want to go to

Related topic DB  
(Developed with Twitter)  
Related semantic units  
Harry potter in USJ→go  
Restaurant area→just looking  
(Utilize semantic units that has a dependency relation with input semantic units)

## System utterances

"I'd like to go Harry potter in USJ"  
"Restaurant area is for just looking"

## Select appropriate utterance generation method for each user utterance

## Input

- Words contained user utterances
- Frequency of words
- Concordance rates with rule patterns

## Output

- Annotated evaluations of sentence of the methods

Estimate with ML

Generate appropriate utterances rather than individual methods!

## Related works

[1] H. Sugiyama, T. Meguro, R. Higashinaka, Y. Minami, "Open-domain utterance generation for conversational dialogue systems using web-scale dependency structures," in *Proc. SIGDIAL*, pp. 334-338, 2013.

[2] T. Meguro, H. Sugiyama, R. Higashinaka, Y. Minami, "Building a conversational system based on the fusion of rule-based and stochastic utterance generation," in *Proc. JSAI, 2M5-OS-20b-2*, 2014 (in Japanese).

## Contact

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