

Optimization of Information-seeking Dialogue Strategy for Argumentation-based Dialogue System

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NEC

Japan

Background | Argumentation-based Dialog System

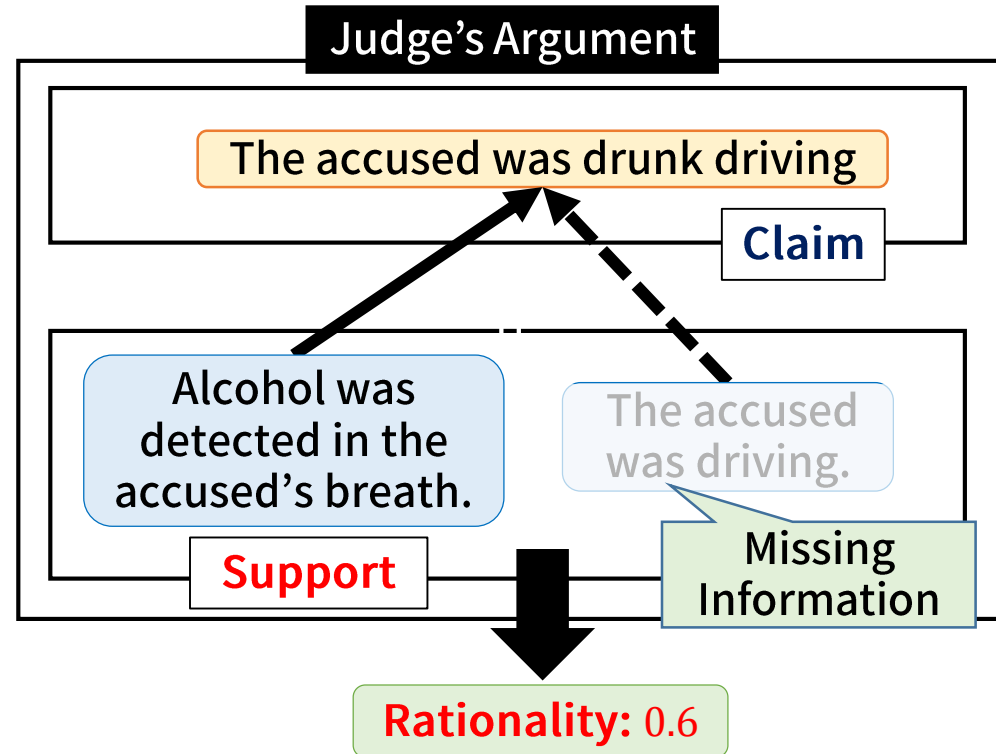
Arguments are exchanged during argumentation-based dialogue

- e.g.) Argumentation of a judge in a trial

The accused was drunk driving,
because alcohol was detected
in the accused's breath.



Judge

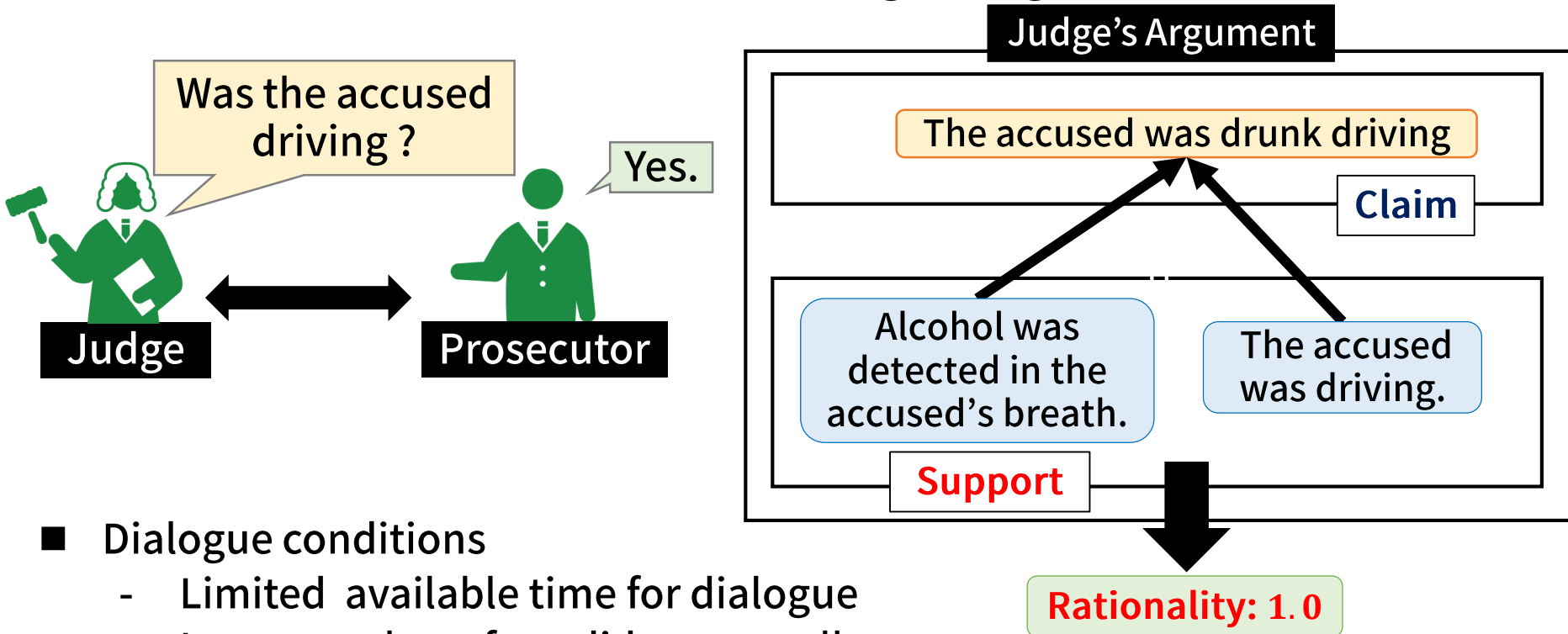


⇒ Need to collect more supportive information during dialogue

- Rationality of argument using weighted abduction [Ovchinnikova+,2011]

Background | Argumentation-based Dialog System

System collects missing supportive information through information-seeking dialogue

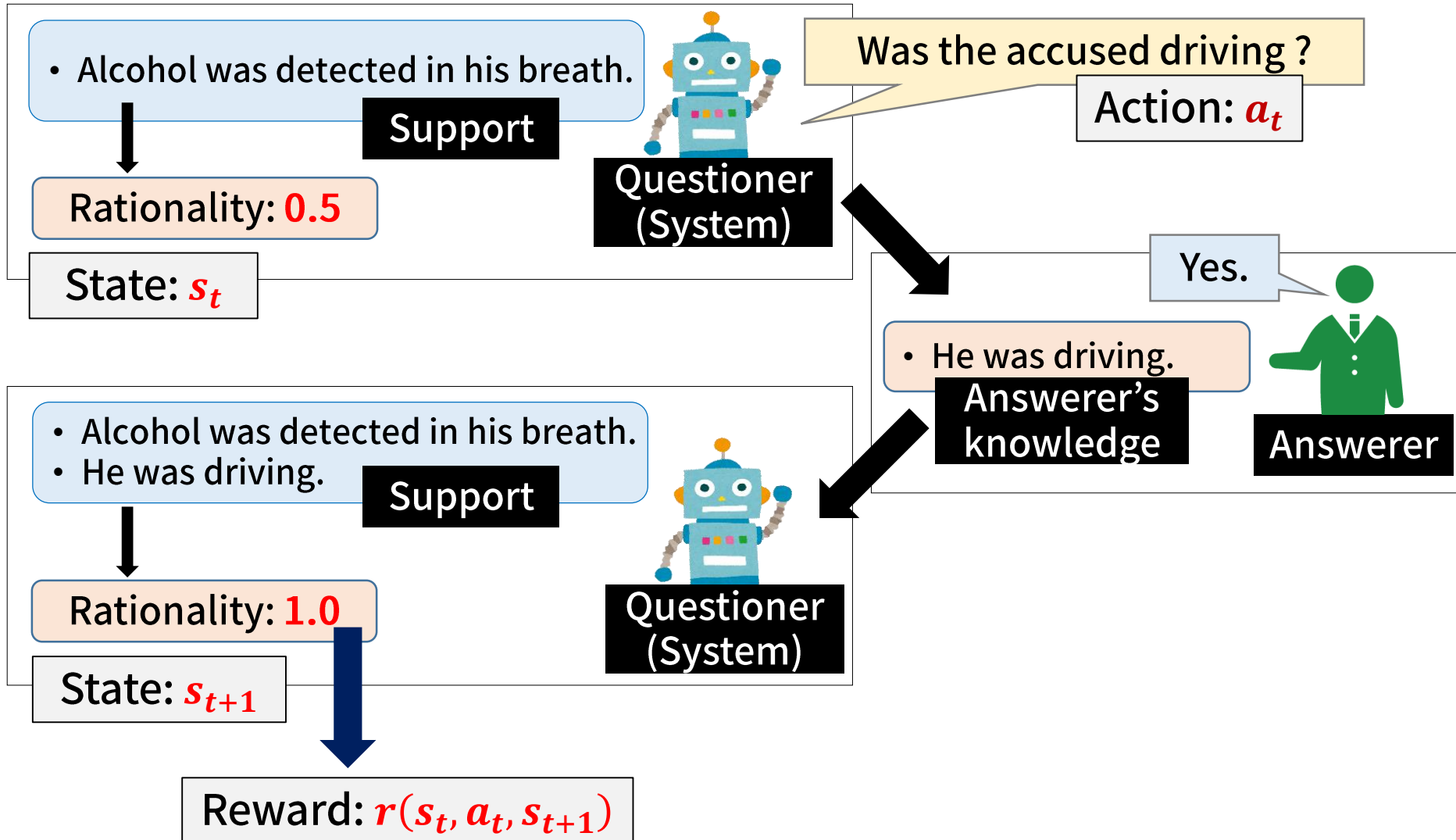


- Dialogue conditions
 - Limited available time for dialogue
 - Large number of candidates to collect

☹ It is very difficult to optimize collecting strategy with handcrafted rules

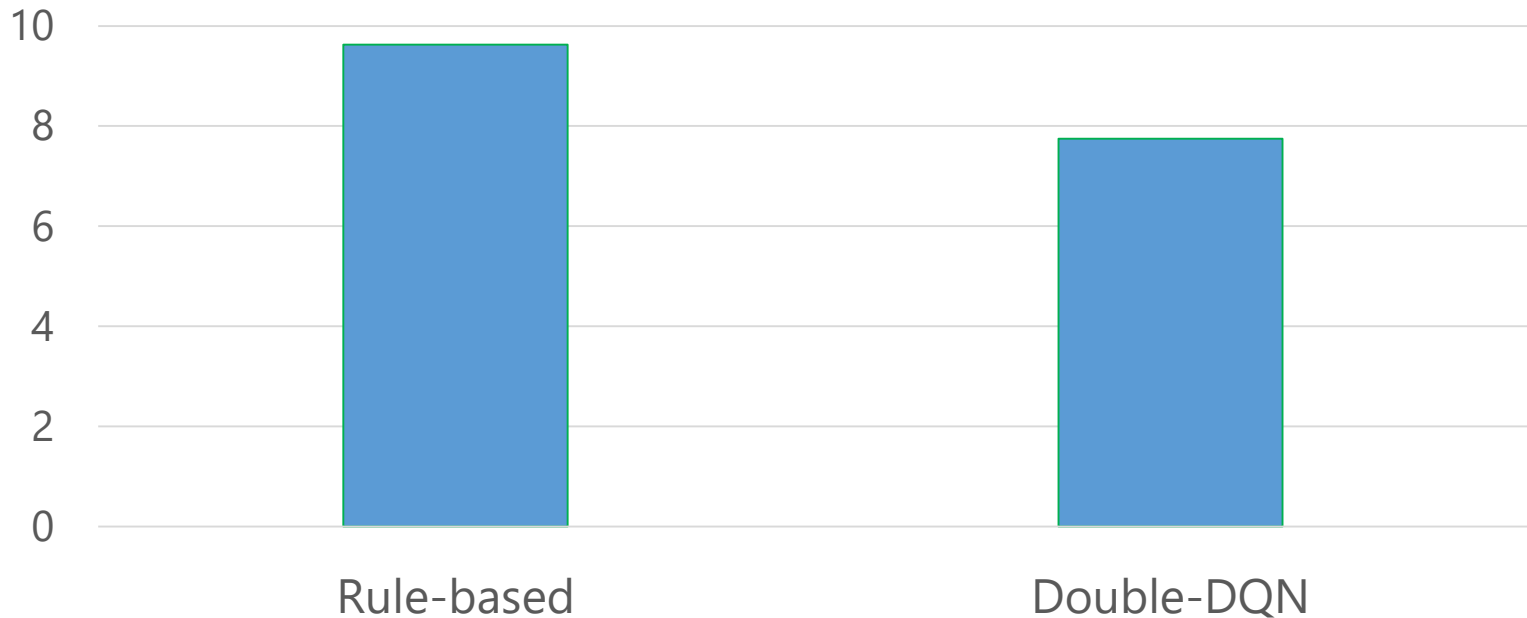
Information-seeking Dialogue for Constructing Rational Arguments

e.g.) System claims “The accused was drunk driving.”



Result

Average turns for information-seeking
over the 50 test dialogues



Proposed strategy collects supportive information more quickly
than rule-based strategy

Summary

- We optimized information-seeking dialogue for constructing rational arguments
- We formalized information-seeking dialogue in MDPs and applied RL(Double-DQN) for optimized strategy
- We compared proposed strategy with rule-based strategy, and confirmed our strategy outperforms rule-base one

EOS