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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.

⇒ Need to collect more supportive information during dialogue

- Rationality of argument using weighted abduction [Ovchinnikova+, 2011]
System collects missing supportive information through information-seeking dialogue

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

ıt 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.”

- Alcohol was detected in his breath.

  Support

  Rationality: 0.5

  State: \( s_t \)

  Questioner (System)

  Was the accused driving? Action: \( a_t \)

- Alcohol was detected in his breath.
  - He was driving.

  Support

  Rationality: 1.0

  State: \( s_{t+1} \)

  Questioner (System)

  Answerer’s knowledge

  Yes.

  - He was driving.

  Answerer

Reward: \( r(s_t, a_t, s_{t+1}) \)
Proposed strategy collects supportive information more quickly than rule-based strategy.
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