

Multi-Domain Human-to-Human Dialog Understanding, a machine reading approach

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1 Description

Dialog systems have shown important progress during the last decade. Machine Learning and more particularly deep learning has dramatically changed this paradigm. However, despite the generalization capability of the recently proposed methods, the dialog remains simple. Indeed, we think the current capabilities of dialog understanding is still superficial. In fact, a vast majority of the inherent complexity of dialog understanding is still not treated. More precisely, the current datasets have focused on lexical variation and domain transfer [HTW13]. In this challenge, we get inspired by the well-formalized task of dialog state tracking [WRRB13, HTW14] that we want to bring to a new level of complexity. To do so, we choose to adopt the recent paradigm of machine reading [HKG⁺15, PL17]. Machine reading has been defined as question-answering over text. Recently, it has been proposed to formalize dialog state tracking as a machine reading task. The adoption of this general paradigm allows handling contextualized understanding, reasoning and common-sense as part of the problem of machine comprehension of human dialogs in the same way it is currently handled for monographs. In this challenge, we develop a machine reading corpora on human-human dialogs. The question and answers have been crowdsourced using the classic protocol of machine reading dataset development. The dataset incorporates both the projective and extractive settings of machine reading [RZLL16, YQZ⁺18].

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The dataset is composed with short human to human dialogs of **24 topics**. The questions are encouraged to leverage the natural challenges of language understanding: common-sense and reasoning.

2 Challenge resources

Our annotations are based on human-human dialogs. The challenge will use short dialogs contextualized in 24 themes for a total of **5k dialogs** for training and **500 dialogs** for testing. The challenge is based on the dialog-per-say and the explicit identification of the theme. Following the paradigm of machine reading, questions over a given dialog will be expressed in natural language. The answer will be of two kinds. First, in the case of an *extractive question*, the answer will be a span of the dialog where the question is asked on. Second, in the case of an *open-ended question*, the answer will be a word that doesn't necessarily refers to any part of the dialog. In both cases, the annotator will inform about the utterances of the dialog that allows composing the answer. These informative sentences are commonly called the supporting facts. Beyond the dialog per se, the candidates are free to pre-trained models with other machine reading dataset. The usage of pre-trained word representation and contextualization are also encouraged. The complete list of them is presented in Table 1

Apartment	Bank	Buyhouse
College	Community	Crime
Dailylife	Dating	Employment
Food	Health	Hotel
Library	Restaurant	Salehouse
Shop	Smalltalk	Social
Transfer	Transport	Travel
Unemployment	Vote	

Table 1: List of the dialog themes

3 Evaluation methods

We plan to use three state-of-the-art measurements of success of machine reading comprehension, **F1** and **Exact Match** over the answer. As an auxiliary task, the **Accuracy** over supporting fact prediction will be computed.

References

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4 Appendice

1	A: I need a suggestion for a restaurant here in Manhattan.
2	B: Certainly! How much are you planning to spend on dinner, sir?
3	A: My date's very sophisticated, so I'm sure she would expect nothing but the best.
4	B: May I suggest our own hotel restaurant?
5	A: Why not!
6	B: It got three stars in the latest restaurant review.
7	A: Hum, but no, thank you, I want to go out on the town. What other ideas do you have?
8	B: There's always Gramercy Tavern. They have live jazz.
9	B: And the food is delicious, but very expensive.
10	A: That sounds like a good place to take a date. Can you make a reservation for me?
11	B: As you wish, sir. You'll have a wonderful time there.
Question: <i>Does the client care about the price of the restaurant?</i> Answer: No Supporting Facts: 3 Type: Projective	
Question: <i>How many restaurants have been proposed?</i> Answer: Two Supporting Facts: 4, 8 Type: Projective	
Question: <i>Which place the client choosed to go?</i> Answer: Gramercy Tavern Supporting Facts: 8, 10 Type: Extractive	
Question: <i>How is the food at the Gramercy Tavern?</i> Answer: Delicious Supporting Facts: 9 Type: Extractive	

Table 2: Dialog example in the restaurant theme

1	A: Can you help me figure out where I should go first to check in at this airport?
2	B: If you already have your ticket, we can take your bags here at the curbside check-in.
3	A: How do I know what gate to go to?
4	B: There are arrivals and departures listed on the screens inside.
5	A: Is there someplace where I can find out what I can carry in my baggage?
6	B: There are signs posted near the baggage check area to help you know what the rules are.
7	A: Can my friend go inside with me?
8	B: Your friend can go with you to the ticket counter but not past the security check.
9	A: When I return, will this curbside area be a good place to get picked up?
10	B: This area is only for departures. The bottom level is for arrivals.
Question: <i>Where should locutorA go first to check-in?</i> Answer: the curbside check-in Supporting Facts: 1, 2 Type: Extractive	
Question: <i>Where is the area for return pick up?</i> Answer: The bottom level Supporting Facts: 9, 10 Type: Extractive	
Question: <i>Can the friend of locutorA pass the security check?</i> Answer: No Supporting Facts: 8 Type: Projective	
Question: <i>Can we take our bags here at the curbside check-in?</i> Answer: No Supporting Facts: 9, 10 Type: Projective	

Table 3: Dialog example in the Transport theme

1	A: I would like to open an account today.
2	B: What kind?
3	A: I want to open a checking account.
4	B: You need to keep a minimum balance.
5	A: How much is it?
6	B: You need at least 100 dollars in your account.
7	A: Really?
8	B: Yes, really.
9	A: Is that all?
10	B: Yes. That's the minimum.
11	A: What happens if I don't meet that requirement?
12	B: You will get a fine.
13	A: How much?
14	B: It's going to be 25 dollars.
Question: <i>Which kind of account Locutor A wish to open?</i>	
Answer: a checking account	
Supporting Facts: 3	
Type: Extractive	
Question: <i>What is the minimum balance?</i>	
Answer: 100 dollars	
Supporting Facts: 4, 5, 6	
Type: Extractive	
Question: <i>What is the amount of the fine?</i>	
Answer: 25 dollars	
Supporting Facts: 12, 13, 14	
Type: Extractive	

Table 4: Dialog example in the Bank theme

1	A: I want to get a bite to eat.
2	B: What are you thinking of getting?
3	A: I have no idea what I want.
4	B: You can get a burger, or some Chinese food.
5	B: Or maybe you can get some Mexican food.
6	A: I wouldn't mind getting some Chinese food.
7	B: Where are you going to get your Chinese food from?
8	A: I'm not sure.
9	B: When I want Chinese food, I go to Panda Express.
10	A: Do they do a good job on the food?
11	B: The food isn't bad there.
12	A: I think I will get my food from Panda Express.
Question: <i>Which kind of food has been chosen?</i>	
Answer: Chinese food	
Supporting Facts: 6, 7	
Type: Extractive	
Question: <i>Which kind of food has not been chosen?</i>	
Answer: Mexican food	
Supporting Facts: 5	
Type: Extractive	
Question: <i>Which restaurant has been chosen?</i>	
Answer: Panda Express	
Supporting Facts: 9, 12	
Type: Extractive	

Table 5: Dialog example in the Food theme

1	A: I was wondering if the buyers have accepted my counteroffer.
2	B: Yes, I just faxed you the information an hour ago. The buyers have a counteroffer for you.
3	A: How much did they counteroffer?
4	B: They now are offering to pay ten thousand less than your asking price.
5	A: I am not really ready to accept that low of a price.
6	B: I wouldn't accept that price either.
7	B: Your home is in a good area and should command a higher price.
8	A: Where do we go from here?
9	B: We should notify them that you are rejecting their current offer.
10	B: They might choose to offer a higher price.
11	A: Please let the buyers know that I am rejecting their offer.
12	B: I will take care of that right away. They may or may not raise their offer.
Question: <i>What is the value of the counteroffer?</i> Answer: Ten thousand less Supporting Facts: 3, 4 Type: Extractive	
Question: <i>Why the counter-offer should be rejected?</i> Answer: Home is in a good area Supporting Facts: 7 Type: Extractive	
Question: <i>Is the counteroffer accepted?</i> Answer: No Supporting Facts: 11 Type: Projective	

Table 6: Dialog example in the Sale House theme