SalesBot:

Transitioning from Open-Domain to Task-Oriented Dialogues

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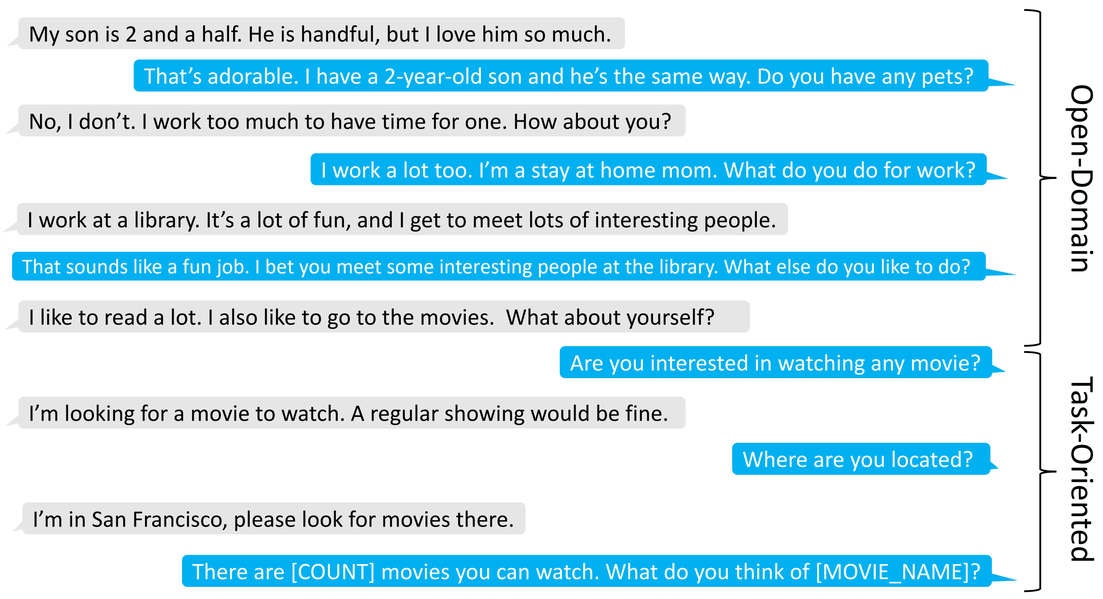
https://github.com/MiuLab/SalesBot

Summary

➢ Background (Open-Domain to Task-Oriented)



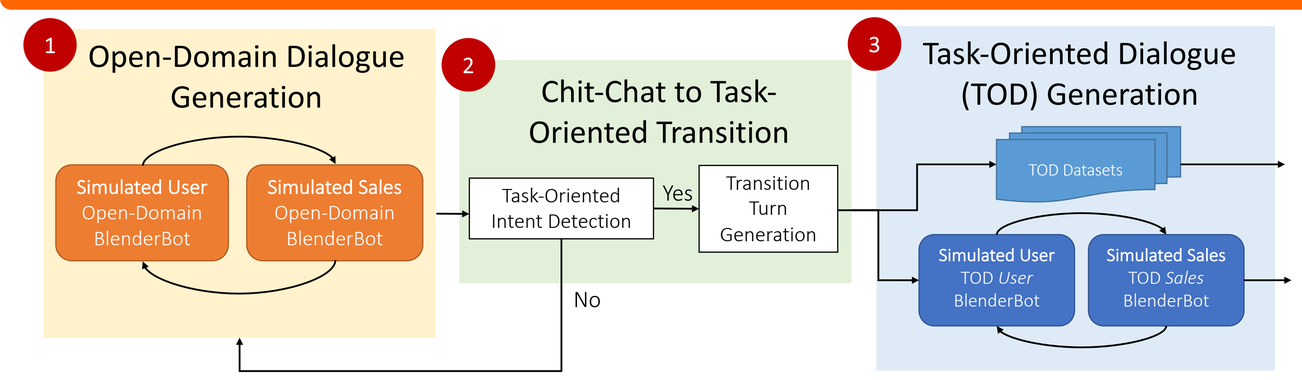
➢ Motivation

- **Connect Different Dialogues: Open-domain** and **task-oriented** dialogue systems have been widely studied **separately** due to their different purposes.
- **Trigger Business Opportunities:** How to **smoothly transition** from social chatting to task-oriented dialogues is important for triggering the business opportunities
  - To capture the suitable timing to promote the target products/tasks
  - To naturally and smoothly promote

➢ Contributions

- **Propose a flexible and scalable framework which:**
  - Involves simulated users and salespersons to automatically generate dialogues.
  - Allows researchers to freely replace simulated users/salespersons and generate unlimited dialogues for semi-supervised and unsupervised usage.
- **Generate new type of dialogues:** The dialogues starts from open-domain social chatting and then gradually transitioning to task-oriented purposes.
- **Release Dataset:** The ***first*** large-scale dataset, which contains the automatically generated dialogues and detailed human annotations for future research work.

Framework



➢ Open-Domain Dialogue Generation

- **Two open-domain bots (BlenderBot):** As the simulated user and salespersons.
- **Generation:** Keep self-chatting until the user potential intent is detected.

➢ Chit-Chat to Task-Oriented Transition

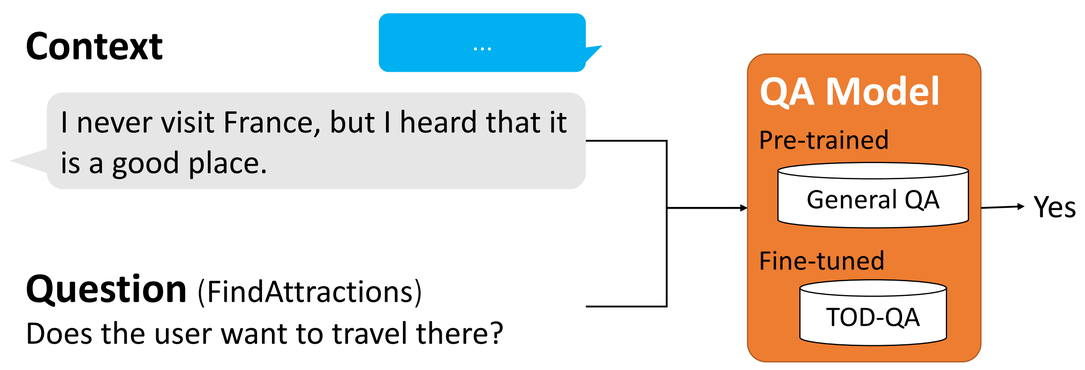
- **Task-Oriented Intent Detection Output:**
  - **Yes:** A potential user intent is detected → **Transition Turn Generation**
  - **No:** Not detected → Stays at **Open-Domain Dialogue Generation**
- **Transition Turn Generation:** Generate a turn to smoothly transition from chit-chat to the intent-related target task dialogues.

➢ Task-Oriented Dialogue Generation

- **Append the corresponding task-oriented dialogue:**
  - **Strategy 1:** Append a task-oriented dialogue whose intent is the same with the detected one, taken from an existed dataset (SGD).
  - **Strategy 2:** Additionally train two simulators on SGD (**User BlenderBot** and **Task-Oriented Sales BlenderBot**), and they talk with each other.

Task-Oriented Intent Detection (Zero-Shot Detector)

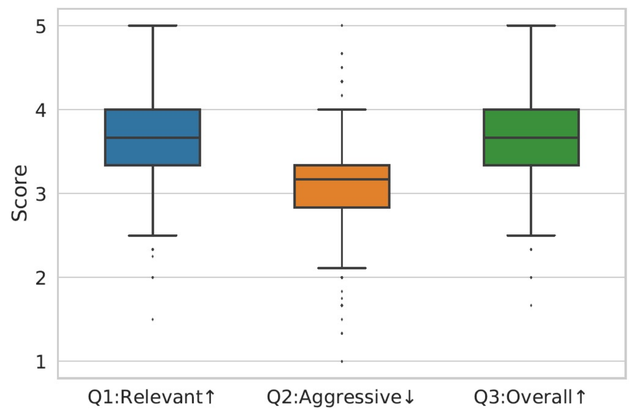
- **A Question-Answering System:** To detect whether the user currently has an *implicit* intent related to a target task:



Human Evaluation

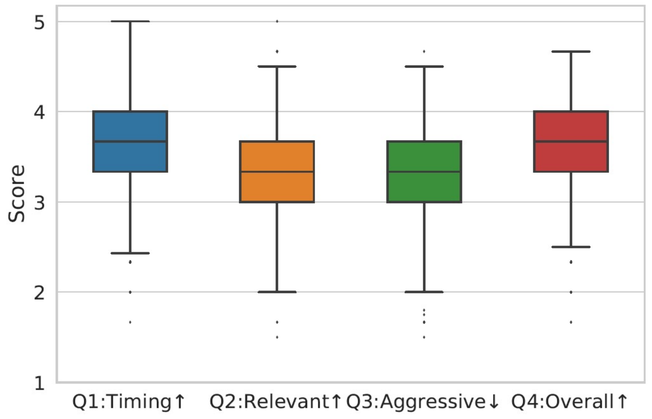
➢ Task 1: Generated Entire Dialogue Evaluation

- **Q1 Relevance:** How relevant is the recommended product or service to the conversation context
- **Q2 Aggressiveness:** How aggressive is the salesperson's communication strategy?
- **Q3 Overall:** Do you think the sales conversation is overall a good example of making a sales recommendations?



➢ Task 2: Generated Transition Turn Evaluation

- **Q1 Right Time:** Is it a good timing to make the transition?
- **Q2 Relevance:** Is the transition relevant to the conversation context?
- **Q3 Aggressiveness**: Is the transition aggressive?
- **Q4 Overall:** Do you think it is overall a good transition?



➢ Task 3: Different Intent Detector Comparison

- **Rank 3 detectors by the detected intents' relevance to a conversation context. The detectors are pre-trained on:**
  1) SQuAD 2.0 + fine-tune on SGD
  2) SQuAD 2.0 + Commonsense Data + fine-tune on SGD
  3) several QA datasets (**NOT** fine-tune on SGD)

Detector	Avg Rank (std.)
Detector1: SQuAD 2.0	1.74 ± 0.48
Detector2: + Commonsense data	1.77 ± 0.48
Detector3: TransferQA	2.00 ± 0.52

Analysis:

- **Detector 1** and **2** perform almost the same, implying that pretraining on extra commonsense data may not improve the ability of detecting implicit intents.
- **Detector 3** is worse than other detectors, indicating the ability of detecting implicit intents cannot be easily transferred.

Conclusion

- Propose a novel framework to generate dialogues that naturally transition from open-domain to task-oriented scenarios without heavy human efforts.
- Human evaluation shows that the generated dialogues have a reasonable quality with natural conversation flows.
- The released data/tools can be used for training agents with sales' behaviors.

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