Minions speaks in Banana language (Minionese).

Para tú

Bello

Tatata bala tu

Kanpai

Response Generation for Grounding in Communication at NTCIR-13 STC Japanese Subtask
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Background

Assuming that we cannot see eye to eye. We still cannot even understand Minions conversation now. So we have a question why our communication is broken.

The reasons are …

1. Comment text has ambiguity of **vocabulary**.
2. Comment text has ambiguity of **domain knowledge**.
3. Intent types of the comment text are **untrusted**.
4. Lack of **knowledge** in the responder.
Objective

What is the purpose of STC task?

The perspectives are …

1. **Fluent**: The response is fluent and understandable from a grammatical point of view.
2. **Coherent**: The response keeps coherence with the topic of the news and the comment.
3. **Context-dependent**: The response depends on and is related to the comment.
4. **Informative**: The response is informative and influences the author of the comment.
Methodology

How to ground in communication?

The method of auto-responder consists of three steps.

Step 1. **Labeling** six intent types to a comment text.

Step 2. **Gathering** associated information.

Step 3. **Generating** responses based on rules.

* Gathering is represented as Finding in our proceedings.
Responder System (1/5)

Segmenting comments and extracted sentences with POS Tagger, and filtering those terms by POS types.

Table 1: POS list for filtering.

<table>
<thead>
<tr>
<th>Type</th>
<th>Subtype</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noun, Adjective-base</td>
<td>General, Verbal, Proper, Adverbial, Number, Suffix</td>
</tr>
<tr>
<td>Verb</td>
<td>Independent</td>
</tr>
<tr>
<td>Adjective</td>
<td>Independent</td>
</tr>
<tr>
<td>Adverb</td>
<td>General</td>
</tr>
<tr>
<td>Auxiliary</td>
<td>Aux special-nai</td>
</tr>
<tr>
<td>Prefix</td>
<td>Normal</td>
</tr>
<tr>
<td>Adjective</td>
<td>Auxiliary</td>
</tr>
<tr>
<td>Filler</td>
<td>*</td>
</tr>
<tr>
<td>Interjection</td>
<td>*</td>
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柴崎/って/誰/?/ 知りませ/ん/が/…/。 (Who is Shibasaki? I don’t know.)

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柴崎/って/誰/?/ 知りませ ん/が/…/。 (Who is Shibasaki? I don’t know.)
Responder System (2/5)

Labeling with SVM.

Table 2: Five labels learned by SVM.

<table>
<thead>
<tr>
<th>Labels</th>
</tr>
</thead>
<tbody>
<tr>
<td>positive / negative</td>
</tr>
<tr>
<td>who</td>
</tr>
<tr>
<td>opinion</td>
</tr>
<tr>
<td>impression</td>
</tr>
</tbody>
</table>

Sports, Shibasaki Gaku, Kashima Antlers, Foot ball, player, transferred, left, Shoma Doi, Gaku Shibasaki, excites, audience, Spanish, Who, Shibasaki, don’t, know

label = \{positive, who\}
Finding more information via internet. (e.g. Google)

Query:
Sports, Shibasaki Gaku, Kashima Antlers, Foot ball, player, transferred, left, Shoma Doi, Gaku Shibasaki, excites, audience, Spanish, Who, Shibasaki, don’t, know

Extracted sentences*:
Shibasaki is from Aomori.
Kashima Antlers
Spain
Japanese football player
A midfielder for Spanish club Getafe CF
La Liga

* Sentences are contained among top three results.
**Table 3: Strategies and rules.**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Rule</th>
<th>Keyword</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Explicit confirm</td>
<td>[1] Yes/No question</td>
<td>parroting</td>
</tr>
<tr>
<td>B: Implicit confirm</td>
<td>[2] Repeating affirmative sentence</td>
<td>alternative keywords</td>
</tr>
<tr>
<td></td>
<td>[3] Repeating affirmative sentence (Parroting)</td>
<td>parroting</td>
</tr>
<tr>
<td>C: Continuation</td>
<td>[4] Responding a question</td>
<td>alternative keywords</td>
</tr>
<tr>
<td></td>
<td>[5] Responding a question with extracted keywords</td>
<td>extracted and alternative keywords</td>
</tr>
</tbody>
</table>

**Generating responses with grounding strategy.**

Q. What name is a Chinese restaurant in Iidabashi?

A: [1] Did you say Iidabashi?

B: [2] There are 96 Chinese restaurants in Iidabashi. [3] Your question is what name is the Chinese restaurant in Iidabashi, right?

Strat | Rule | Template
--- | --- | ---
A: [1] | [R_1] "Don’t you"+w2+"who"+w1+"is?" | Don’t you know who Shibasaki is?
B: [2] | [R_2] w1+"is"+a1+", you know." | Shibasaki is from Aomori, you know.
C: [3] | [R_3] "You"+w3+w2+w1+"is , right?" | You don’t know who Shibasaki is, right?
D: [4] | [R_4] "Do you know"+a2+"?" | Do you know Kashima Antlers?
E: [5] | [R_5] w1+"is"+a3+", right?" | Shibasaki is a foot ball player, right?

### Table 4: Five templates.

**Responder System (5/5)**

Generating responses with candidate words and five response rules.

- **w1** = \{Shibasaki\}
- **w2** = \{know\}
- **w3** = \{don’t\}

- **a1** = \{from Aomori\}
- **a2** = \{Kashima Antlers\}
- **a3** = \{a foot ball player\}

- Why rule-based?
  - Because, we tried the generating sentence with LSTM. However, the sentence is not enough fluent.
スポーツ
ニューアイングランド・ペイトリオッツ|アメリカ合衆国|アリゾナ・カーディナルス|スーパーボウル
NFL優勝選手が大統領表彰
拒否失うものがあったとしても、自分の根っこずの部分は曲げない。大事な事だと感じる。

コンピュータ
人工知能(AI)|NEC|機械学習|ディープラーニング
NEC AIを活用した創業に参入
こういう記事に否定的な意見を言う人にはうらめし。是非とも頑張ってもらいたい。

経済
ティファニー不振 CEOが退任
好きなブランドの一つだけど、最近、気品が感じられない。

エンターテイメント
SMAP|大野智|ジャニーズ|活動休止・解散(芸能界)|嵐(グループ)
嵐・大野「SMAPは偉大すぎ」
本当にそう思うなら、もっと早い段階に、自分の言業でSMAPに対する思いを語ってほしかった。それは、他のジャニーズメンバーに対しても同じ。

Other Responses
曲げを感じたの？
プレディは欠席したね。
曲げたように感じたね。
表敬訪問を拒否しましたか？
なぜプレディは拒否したと思いますか？

記事を否定する人がいるの？
NECがサイバー攻撃分析にAI導入だって？
否定意見を言う人も是非頑張ってほしいね。
なぜNECは頑張っていますか？
なぜNECはAIを活用すると思いますか？

気品を感じないの？
業績不振を理由に辞任したね。
気品を感じないね。
トランプ・タワーに本店が隣接してるの？
なぜティファニーは業績不振と思いますか？

SMAPはジャニーズメンバーですか？
大野智が解散するSMAPに言及したね。
自分の言業で語ってほしかったね。
もっと早い段階ですか？
SMAPは偉大ですか？
Experiments

Generating responses with five response rules are pretty good at Rule-1.

<table>
<thead>
<tr>
<th>Run ID</th>
<th>Mean nG@1</th>
<th>Mean nERR @1</th>
<th>Mean AccL1 @1</th>
<th>Mean AccL2 @1</th>
<th>Mean AccL1,2@1</th>
</tr>
</thead>
<tbody>
<tr>
<td>AITOK-J-R1</td>
<td>0.4468</td>
<td>0.4838</td>
<td>0.0280</td>
<td>0.0660</td>
<td>0.9840</td>
</tr>
<tr>
<td>GOLD-J-R1</td>
<td>0.7759</td>
<td>0.7759</td>
<td>0.7220</td>
<td>0.4430</td>
<td>0.5810</td>
</tr>
<tr>
<td>KIT16-J-R1</td>
<td>0.5014</td>
<td>0.5580</td>
<td>0.1600</td>
<td>0.1610</td>
<td>0.3000</td>
</tr>
<tr>
<td>KIT16-J-R4</td>
<td>0.4804</td>
<td>0.5372</td>
<td>0.2040</td>
<td>0.2030</td>
<td>0.3100</td>
</tr>
<tr>
<td>YJT1-J-R2</td>
<td>0.4803</td>
<td>0.5468</td>
<td>0.2940</td>
<td>0.1600</td>
<td>0.3100</td>
</tr>
</tbody>
</table>

What happened?

However, those responses are extremely bad at Rule-2.

Table 5: Top five of Mean AccL1,2@1 in Rule-2 and AITOK-J-R1.

<table>
<thead>
<tr>
<th>Run ID</th>
<th>Mean nG@1</th>
<th>Mean nERR @1</th>
<th>Mean AccL1 @1</th>
<th>Mean AccL2 @1</th>
<th>Mean AccL1,2@1</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOLD-J-R1</td>
<td>0.7646</td>
<td>0.7689</td>
<td>0.4720</td>
<td>0.4430</td>
<td>0.8660</td>
</tr>
<tr>
<td>YJT1-J-R2</td>
<td>0.4726</td>
<td>0.5288</td>
<td>0.2040</td>
<td>0.2030</td>
<td>0.7280</td>
</tr>
<tr>
<td>KIT16-J-R1</td>
<td>0.4173</td>
<td>0.4676</td>
<td>0.1800</td>
<td>0.1600</td>
<td>0.6300</td>
</tr>
<tr>
<td>KIT16-J-R4</td>
<td>0.4014</td>
<td>0.4549</td>
<td>0.1600</td>
<td>0.1610</td>
<td>0.6200</td>
</tr>
<tr>
<td>YJT1-J-R2</td>
<td>0.4171</td>
<td>0.4441</td>
<td>0.1800</td>
<td>0.1600</td>
<td>0.6100</td>
</tr>
<tr>
<td>AITOK-J-R1</td>
<td>0.0816</td>
<td>0.1758</td>
<td>0.0280</td>
<td>0.0650</td>
<td>0.1400</td>
</tr>
</tbody>
</table>

Don’t you know who Shibasaki is?

Who is Shibasaki? I don’t know.
Experiments

What’s difference between RULE-1 and RULE-2?

RULE-1:
IF fluent & coherent = L1
  IF context-dependent & informative = L2
    THEN L2
  ELSE L1
ELSE
L0

RULE-2:
IF fluent & coherent = L1
  IF context-dependent & informative = L2
    THEN L2
  ELSE IF context-dependent or informative = L0
    THEN L0
  ELSE L1
ELSE
L0

If the response is not related to the comment and the response is not informative to continue and extent the dialogue, the response is evaluated by fluent and coherent.

If the response is not related to the comment and the response is not informative to continue and extent the dialogue, the response is evaluated by fluent and coherent except in case of not related to the comment or not informative at all.
Discussion

- Communication grounding strategies are very effective.
- The grounding rule is based on ungrounded assumption between initiators and responders.

- The formal-run result is really good in Rule-1.
- That’s why the responder is attempting to communicate.
- However, the result is not enough in Rule-2.
- These responses have short of expanding information.
Conclusion

- Our approach can make sure of grounding in communication to Yahoo! News comments.

- The formal-run result was extremely good in Rule-1, although the approach is very simple. The result showed that \textit{It's important to be a good listener}.

- Besides, the result was not enough in Rule-2 due to not to extend the dialogue, because the response has less expanding information.