

Creating a data set of abstractive summaries of turn-labeled spoken human-computer conversations

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Summaries and conversational agents

Overview

- Behavior-based Language-Interactive Speaking Systems (BLISS)*
- Human-machine interaction
- Spoken Dutch conversations that focus on the user's health and well-being



*More details on the website: <https://bliss.ruhosting.nl>

Summaries and conversational agents

What can a summary add to a conversational agent?

- Transparency about the data that is collected by the system during the conversation
- An opportunity for the user to correct erroneous data



Existing spoken dialogue summarization data sets

ISCI meeting corpus

- English
- Audio of multi-party meetings

AMI meeting corpus

- English
- Audio and video of multi-party meetings

Spotify Podcast data set

- English
- Audio of multi-party podcasts

Challenge

No Dutch dialogue summarization data set

Approach

Create a new data set by extending two existing Dutch spoken dialogue data sets – BLISS and JASMIN-CGN

Extending two Dutch spoken dialogue data sets

BLISS corpus

- 5 hours of audio material
- 68 conversations between the artificial BLISS agent and a human user
- Automatic transcriptions

JASMIN-CGN corpus

- 90 hours of two types of audio material:
 - Read speech
 - Wizard of Oz human-machine dialogues
- 489 conversations between a human simulator and a human user
- Manual transcriptions

Preprocessing steps

BLISS corpus

- Manually transcribe every conversation in the corpus

JASMIN-CGN corpus

- Split the Wizard of Oz conversations in two parts:
 1. A discussion between the user and agent about planning a trip
 2. A discussion of the user's daily activities and motivations for these activities

Turn labeling the conversations

Turn labelling steps

1. Divide the dialogue into question-and-answer (QA) pairs and single turns
2. Label the QA pairs and single turns

Example of a Dutch dialogue section between the BLISS agent and human user

Agent: Hallo! Heb je wel eens tegen een computer gepraat die terug praat?
User: Uh. Uh. Nee

Agent: Oh, dat is toevallig, ik heb ook nooit eerder met mensen gepraat. Hoe vind je het om zo met mij te praten?
User: Bijzonder.

Translated example of a Dutch dialogue section between the BLISS agent and human user

Agent: Hi! Have you ever spoken with a computer that talks back?
User: Uh. Uh. No

Agent: Oh, that is a coincidence, I have never spoken with people before. How do you like talking with me like this?
User: Special.

Turn label dimensions

1. Specificity

- Informative content labels denote domain-specific information like the user's daily activities
- Interaction communication labels denote more generally occurring dialogue acts like greetings

2. Number of participants

- A single turn denotes a single participant, either the user or the agent
- A QA pair denotes an interaction between the user and the agent

3. Repetition

- Whether the information provided in the turn has been previously shared

Turn labeling example

Example of a Dutch dialogue section between the BLISS agent and human user

SOCIAL INTERACTION

Agent: Hallo! Heb je wel eens tegen een computer gepraat die terug praat?

User: Uh. Uh. Nee

SOCIAL INTERACTION

Agent: Oh, dat is toevallig, ik heb ook nooit eerder met mensen gepraat. Hoe vind je het om zo met mij te praten?

User: Bijzonder.

ACTIVITY INFORMATION INTERACTION

Agent: Ik ga er van blozen! Nu ben ik wel nieuwsgierig naar jou! Als je nu één ding mocht kiezen wat je komend weekend zou willen doen. Wat zou dat zijn?

User: Uit eten.

Translated example of a Dutch dialogue section between the BLISS agent and human user

SOCIAL INTERACTION

Agent: Hi! Have you ever spoken with a computer that talks back?

User: Uh. Uh. No

SOCIAL INTERACTION

Agent: Oh, that is a coincidence, I have never spoken with people before. How do you like talking with me like this?

User: Special.

ACTIVITY INFORMATION INTERACTION

Agent: You are making me blush! Now I am curious about you! If you could now choose one thing you would like to do this weekend. What would that be?

User: Going out for dinner.

Result: Dutch spoken dialogue summarization data set

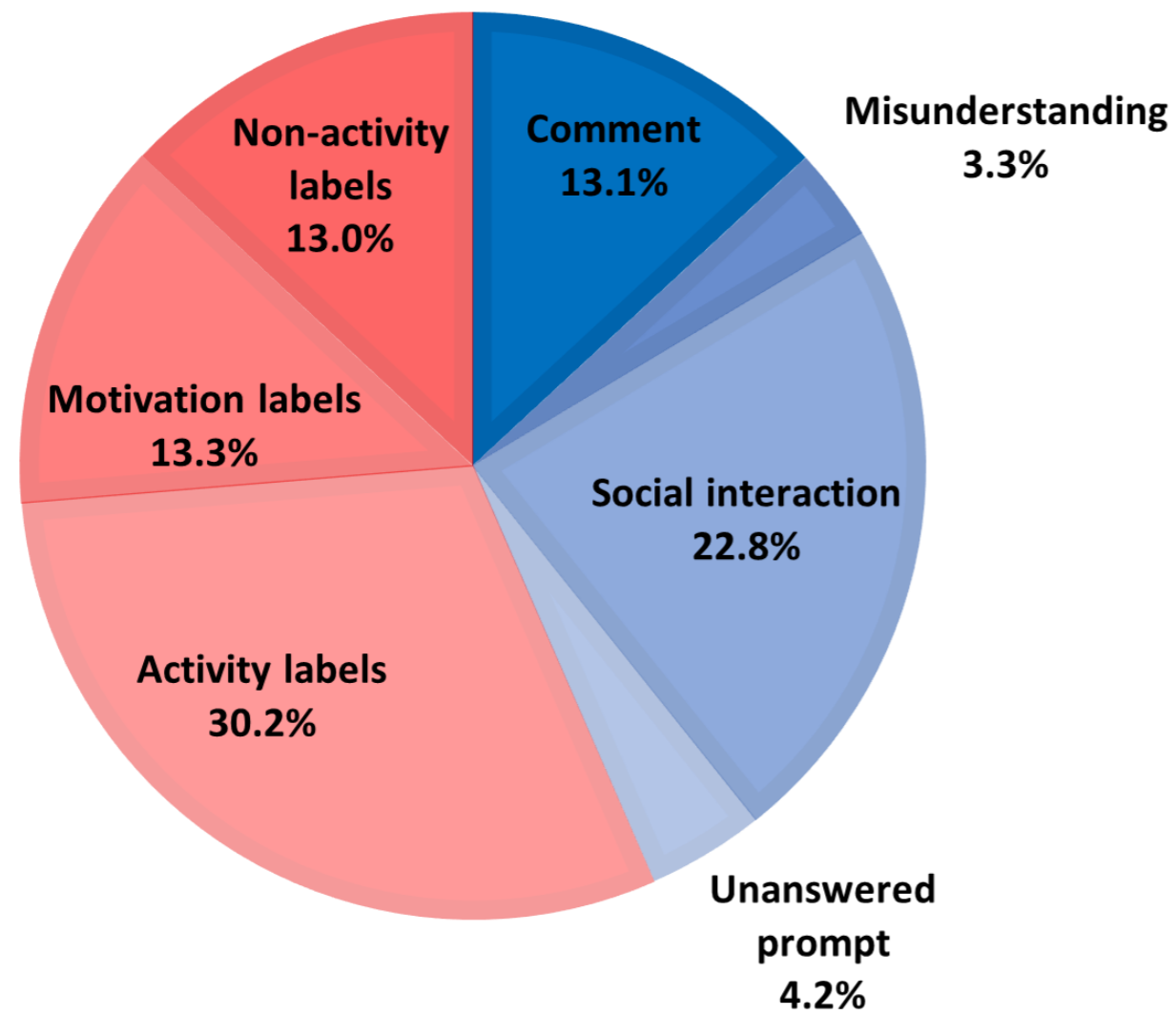
- 557 dialogues
- 685 annotated dialogues
- 685 summaries

BLISS characteristics	Size
# of dialogues	68
# of turn labels	1243
# of tokens in user turns	9521
# tokens spoken by user	40%
# summaries	136
# av. tokens in summaries	90
# compression rate	24%

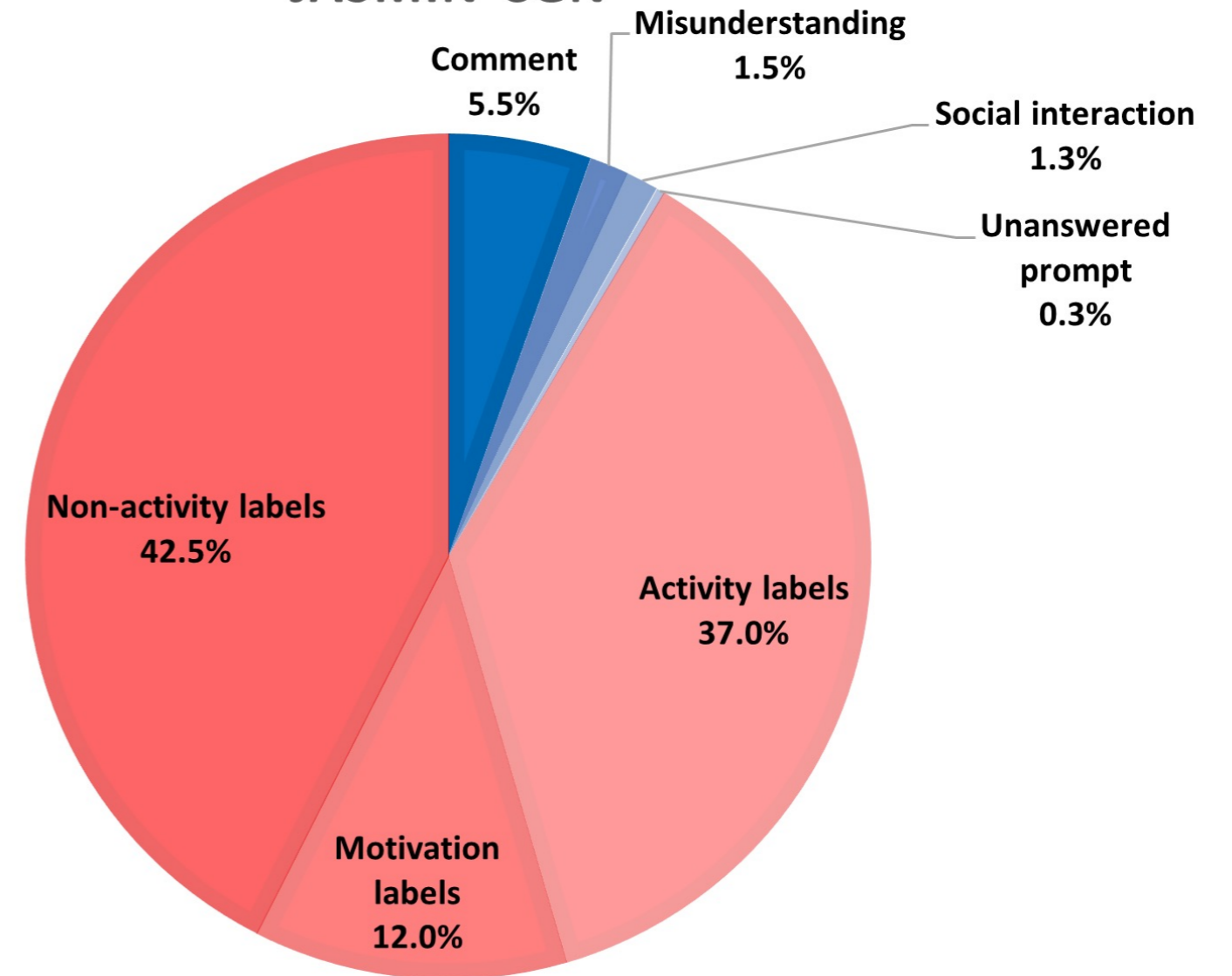
JASMIN-CGN characteristics	Size
# of dialogues	489
# of turn labels	7866
# of tokens in user turns	57007
# tokens spoken by user	43%
# summaries	549
# av. tokens in summaries	58
# compression rate	21%

Turn labels distribution

BLISS



JASMIN-CGN



Future possibilities

Future work

- Research the suitability of transformer-based models for Dutch dialogue summarization
 - Fine-tuning two transformer approaches on the summarization data set

Data set availability for research purposes by September 1st

- Training set containing 459 dialogues, annotations, and summaries by a single author
- Test set containing 98 dialogues, 196 annotations, and 196 summaries by two authors

Possible uses of the data set

- Research into automatic turn splitting and labelling of dialogues
- Discourse-oriented research into dialogue flow or human-computer misunderstandings