We experimentally investigated the information needed for handing over a dialogue by dialogue handover experiment.

### Dialogue Handover Experiment

We aimed to implement these findings in an interface suitable for dialogue handover.

- Several underlying techniques will be necessary, such as extracting adjacency pairs and key-value pairs from the dialogue history.
- It may also be necessary to format the extracted adjacency pairs in a more concise way for understanding the content quickly.

### Dialogue

- Two operators act as one operator, swapping at regular intervals, and interact with one user on Zoom.
- Three dialogue tasks were conducted to identify the general elements for a handover of various types of dialogue.
- Chat task: Operator listens to user’s favorite things by asking questions and responding.
- Consultation task: Operator consults with user on user’s travel plan.
- Sales task: Operator recommends one of three vacuum cleaners to user.

### Operator switching

- Two operators swap every 2 minutes.
- The users were not informed of the switching. To prevent the user from detecting the switching, the operators changed their voices and appeared as an avatar.

### Note settings

- Each operator takes notes and passes them on to the next operator every time they switch.
- Notes are handwritten on A4 paper.

### Questionnaire

- The operators and the users filled out questionnaires regarding naturalness and content understanding.
- The evaluations from the users were typically around four out of seven points, indicating that they were able to interact with the operator reasonably well even when the operators periodically switched.

### Analysis of the Notes

The number of characters and the format in the notes roughly converged for both operator pairs and dialogue task at the end of the experiment.

### Adjacency Pairs

- Operator and user utterances were separated into left and right and connected by arrows.
- This format represents a basic exchange (e.g., question-answer)
- This format can make it possible to track basic exchanges (who said what to whom) and avoid inconsistency of their own utterances.
- The notes included extended adjacency pairs:
  - pre/post-expansions
  - comment and follow-up
  - third pair PST (e.g., initiation-response-follow-up)

### Key-value Pairs

- This format represents slot-value pairs in a particular domain.
- This format can make it possible to grasp at a glance the information that has already been mentioned.

### Analysis of Discussions and Interviews

- One operator stated that, after switching, she referred to only the most recent information because she did not immediately have time to read the whole note carefully.
- From the next turn onward, she went back through the notes to grasp the history of the note.
- It is necessary for the operators to have two types of information: most recent information and dialogue history.
- One operator stated that it was difficult for two operators to behave as one unless they knew the personality of the other.
- It is important for the operators to share the same profile information in order to keep the consistency of the dialogue.

### Future Work

- We aim to implement these findings in an interface suitable for dialogue handover.
- Several underlying techniques will be necessary, such as extracting adjacency pairs and key-value pairs from the dialogue history.
- It may also be necessary to format the extracted adjacency pairs in a more concise way for understanding the content quickly.