1 Background

Phonetic Accommodation
- property of human-human spoken interaction
- converge to or diverge from interlocutor w.r.t. phonetic detail

Wizard-of-Oz (WoZ) Experiment
- used in human-computer interaction (HCI) research
- subjects believe to interact with autonomous system
- system is operated by human experimenter, i.e., the wizard

WoZ Experimentation on Phonetic Accommodation

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Feature</td>
<td>speaking rate</td>
<td>amplitude, duration, response latency</td>
</tr>
<tr>
<td>Agent</td>
<td>embodied</td>
<td>embodied</td>
</tr>
<tr>
<td>Speech</td>
<td>natural (manipulated w/ TD-PSOLA)</td>
<td>parameterized segment concatenation (L&amp;H)</td>
</tr>
<tr>
<td>Effect</td>
<td>convergence</td>
<td>convergence</td>
</tr>
</tbody>
</table>

Previous Own Experimentation
In a shadowing experiment with natural and synthetic stimuli, participants showed converging behavior on the following levels:
- word-level pronunciation \( \rightarrow \) \( [\text{ei}] / [\text{k}] \), \( [\text{ei}] / [\text{se}] \), \( [\text{n}] / [\text{an}] \)
- pitch accent realization \( \rightarrow \) amplitude envelope match
- pitch accent composition

Goals of this Study
- further explore phonetic accommodation in HCI
- create dynamic exchange between system and user
- simulate intelligent spoken-dialogue system \( \rightarrow \) WoZ

2 WoZ Setting

Scenario: computer-assisted language learning w/ target language German

User Groups:
(1) German L1
(2) French L1 and German L2

Dialogue Type:
- task-oriented
- supported by visual feedback

Database:
pre-synthesized utterances

Speech:
HMM-based synthesis, female

Manipulation:
systematic variation of features:
- intonation pattern
- pitch accent placement
- segmental pronunciation
- speaking rate

3 WoZ Platform (in prep.)

Wizard/Experimenter View:

User View:

4 Predictions

- users phonetically converge to the system output \( \rightarrow \) uncontroversial content of conversation
- user groups
  (a) German L1 \( > \) French L1
  \( \rightarrow \) perception of phonetic detail in German and capability to reproduce it
  (b) French L1 \( > \) German L1
  \( \rightarrow \) less secure in target language, more prone to variation
- individual differences
  \( \rightarrow \) personality traits (Big Five, ego boundaries...)