Sign Synthesis: State of the Art

- Still in a formative state
- Requires regular feedback from users
- Requires rich feedback from users
  - quantitative data is not sufficient

Face-to-Face test setup

- facilitator
- participant
- note taker

Face-to-Face testing

Face-to-Face challenges

- Language barrier
- Scheduling
- Cost

Face-to-Face challenges

- Travel expenses (parking)
- Recruitment
- Locality
- Alternative: Deaf conventions
Remote testing

- Language barrier
- Scheduling
- Cost
- Travel expenses (parking)
- Recruitment
- Locality

Language Barrier

- Low literacy rates in US Deaf population
- ASL is preferred to English
- In the US, remote testing platforms use English.
- Qualitative feedback in English

Remote Testing Wish List

- Highly visual, not textual
- All language is signed language
- Webcam recording
- Easy navigation

New! SignQUOTE

Sign
Qualitative
Usability
Online
Testing
Environment

- Remote system
- Configurable
- Cross-platform
- Asynchronous

SignQUOTE

- Interface entirely in Sign
- Test at any time
- Simultaneous sessions OK
- Reduces cost

TestServer

Instructions

Test animation
**TestServer**

- Test participant interacts with TestServer.
- To begin, participant opens URL in a browser.
- All interaction is in signed language.
- Uses *indexing* to obviate need for labels.
- Webcam captures responses to open-ended questions.

**Indexing**

**Webcam**

- For open-ended questions
- Instruction: “Record your feedback.”
- Response area now shows a webcam control.
- Recordings are destroyed when the study is complete.

**TestServer**

**Architecture**

**TestDesigner**

- Create, edit, deploy tests over the Web
- Upload test animations, recorded instructions, pre-test questionnaire and informed consent as video files.
- Any number of questions
- Formats: Likert, True/False, Open-Ended
Screen shot

Confidentiality

- Hire certified interpreter to voice the recorded videos.
- Audio record the interpreter's voicing and take notes.
- Researchers never need see participant’s face.
- Recordings are destroyed when the study is complete.

Technical details

- Written in Adobe Flex
- Runs on Apache server
- Data collection via PHP
- Uses Red5 or WowZa Media Server2 for video streaming
- Recorded videos in FLV form

Evaluation of SignQUOTE

- First phase: Usability testing
  Is the interface self-explanatory to participants?
- Second phase: Examining collected data
  How does the data collected by this technology compare to data collected face-to-face testing?

Usability Test

- Evaluating learnability, ease of navigation and functionality with participant’s OS, browser.
- Tests either face-to-face or with Skype
- Participants given URL and told to visit site.
- No other instructions, but encouraged to ask questions, give feedback.

Usability Test

- Participants viewed an Informed Consent and four animations.
- Participants answered two open-ended, two close-ended questions about each animation
- At conclusion, participants answered a few debriefing questions.
Findings

- Functionality issues on Apple OS (fixed)
- Add video controls for scrubbing (done)
- Indexing was easily understood
- 100% agreement with statement ‘ASL is better than English for this type of test.’

Comparing Face-to-face and SignQUOTE

- Had data from a previous face-to-face test (Schnepp, 2010)
  - 20 participants
  - Viewed 5 animations of ASL sentences
  - 4 questions per animation (two close-ended, two open-ended)
- Conducted same test using SignQUOTE
  - 22 participants
  - Same stimuli, same questions

Examined

- Quantitative data (as a check)
  - Judging affect
  - Judging size of a cup
- Qualitative data
  - Repeating the sentence just viewed.
  - Suggestions for improvement

Quantitative Data

<table>
<thead>
<tr>
<th>Animation number</th>
<th>Face to Face Median</th>
<th>Remote Median</th>
<th>Mann-Whitney</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (affect)</td>
<td>3</td>
<td>4</td>
<td>.38</td>
</tr>
<tr>
<td>2 (affect)</td>
<td>2</td>
<td>1</td>
<td>.21</td>
</tr>
<tr>
<td>3 (size)</td>
<td>5</td>
<td>4</td>
<td>.85</td>
</tr>
<tr>
<td>4 (size)</td>
<td>4</td>
<td>4</td>
<td>.30</td>
</tr>
<tr>
<td>5 (size)</td>
<td>5</td>
<td>5</td>
<td>.57</td>
</tr>
</tbody>
</table>

- Differences not statistically significant

Qualitative data

- Comparisons are tricky!
- Elicitation
  - percentage of participants who made suggestions for improvement
- Overlap
  - Agreement between face-to-face, SignQUOTE suggestions
Qualitative data

- **Elicitation**
  - percentage of participants who made suggestions for improvement
- **Overlap**
  - Agreement between face-to-face, SignQUOTE suggestions
  - \(\frac{(f2f \cap \text{remote})}{#(f2f)}\)

Elicitation

<table>
<thead>
<tr>
<th>Animation</th>
<th>Face-to-face</th>
<th>SignQUOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animation 1</td>
<td>50%</td>
<td>68.18%</td>
</tr>
<tr>
<td>Animation 2</td>
<td>65%</td>
<td>68.18%</td>
</tr>
<tr>
<td>Animation 3</td>
<td>35%</td>
<td>50.00%</td>
</tr>
<tr>
<td>Animation 4</td>
<td>55%</td>
<td>68.18%</td>
</tr>
<tr>
<td>Animation 5</td>
<td>40%</td>
<td>63.64%</td>
</tr>
</tbody>
</table>

- More suggestions from SignQUOTE
- But not significantly so

Overlap

<table>
<thead>
<tr>
<th>Animation</th>
<th>Face-to-face</th>
<th>SignQUOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animation 1</td>
<td>50%</td>
<td>(2 / 4)</td>
</tr>
<tr>
<td>Animation 2</td>
<td>40%</td>
<td>(2 / 5)</td>
</tr>
<tr>
<td>Animation 3</td>
<td>33%</td>
<td>(1 / 3)</td>
</tr>
<tr>
<td>Animation 4</td>
<td>50%</td>
<td>(3 / 6)</td>
</tr>
<tr>
<td>Animation 5</td>
<td>33%</td>
<td>(2 / 6)</td>
</tr>
</tbody>
</table>

- Consistent with other comparisons of remote and face-to-face testing.

Lessons Learned

- **Recruiting**
  - Similar to face-to-face recruiting
  - Pre-test questionnaire to qualify participants
- Use short video clips
- A complement, not a replacement, for face-to-face testing

Results

- Lower cost, fewer scheduling challenges
- Tests occur more often.
- Improvements happen more quickly.
It’s Open Source

- Via the GNU Affero General Public License
- Download at asl.cs.depaul.edu/signQUOTE

Special Thanks

- Jeff Karova
- Brianne DeKing

Thank You!