SKETCH SEARCH

Cecilia Mauceri
Future Computing Lab
Advisor: Dr. Richard Souvenir
TA: Scott Spurlock
TEXT-BASED VIDEO RETRIEVAL
SKETCH-BASED SOLUTIONS

Detexify² - LaTeX symbol classifier

http://detexify.kirelabs.org/

http://www.yellowbridge.com/chinese/
Our Interfaces

Freehand

Puppet
MATCHING PROCESS

Sketch → Animate → Query → Compare → Result
MATCHING ALGORITHM
USER STUDY PROCEDURE

- 81 Participants
  - Test all three interfaces
  - Video Prompt vs. Text Prompt

  - “Please draw the following action:”

- Randomly assigned action from
  - Cross Arms, Scratch Head, Kick, Point, Wave, Throw
## HYPOTHESIS

<table>
<thead>
<tr>
<th></th>
<th>Freehand</th>
<th>Puppet</th>
<th>Keyframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease of Use</td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Speed</td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td></td>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>
**Recorded Data**

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease of Use</td>
<td>• Post Survey&lt;br&gt;• Log of user actions</td>
</tr>
<tr>
<td>Speed</td>
<td>• Time to complete each sketch</td>
</tr>
<tr>
<td>Accuracy</td>
<td>• Snapshot of each sketch&lt;br&gt;• Animations</td>
</tr>
</tbody>
</table>
"Best Interface Overall"

- 84% Freehand
- 12% Puppet
- 4% Keyframe

"(Keyframe) allows more detailed control of the limbs."

"I could break down actions into steps."

"KEYFRAME IS DA BOMB"
Sketch Time

Mean time per sketch (seconds)

Freehand | Puppet | Keyframe
THE GRAIN OF SALT

Kick Prompt

Throw Prompt
**Future Work**

- Evaluate interfaces on touchscreen device
- View invariant matching for canonical sketches
- Adapting to internet-scale searches (e.g. MPEG-7 descriptors)
Questions?