Project #2 Final Demo: $P, MMG and Zhuyin Multistroke Gesture, Yu-Peng Chen

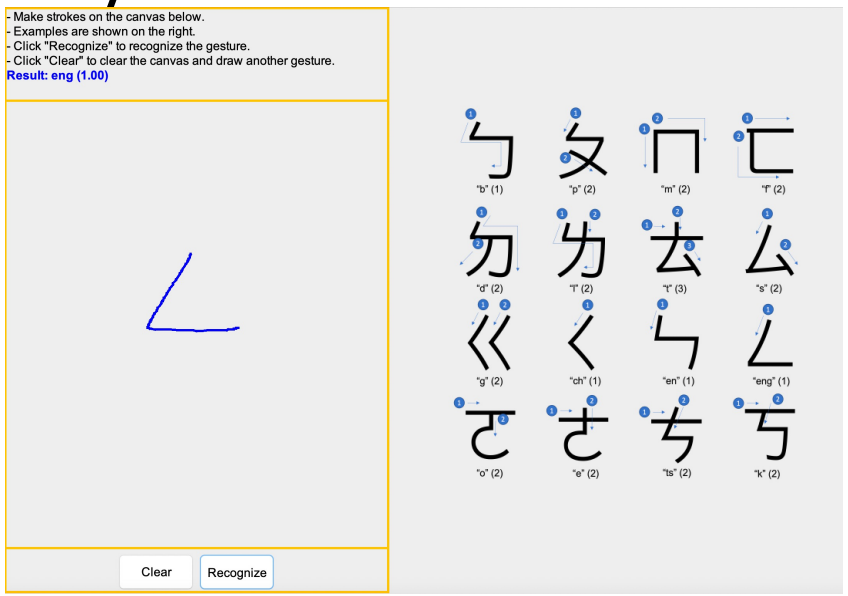
CIS6930 Human-Centered Input Recognition Algorithms
Instructor: Dr. Lisa Anthony

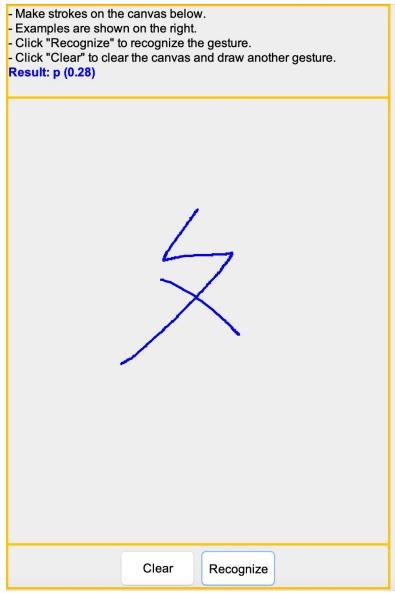
April 14, 2022

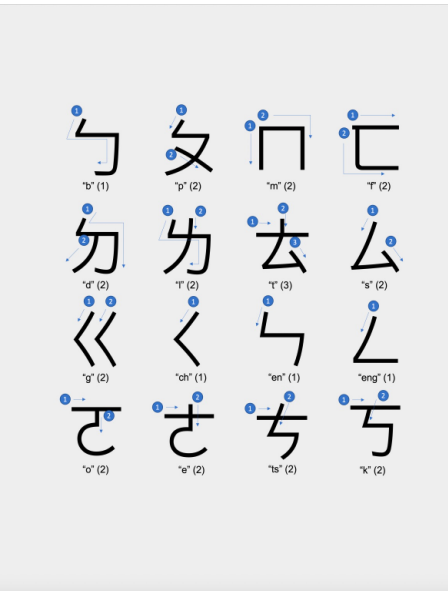
Project #2 Overview

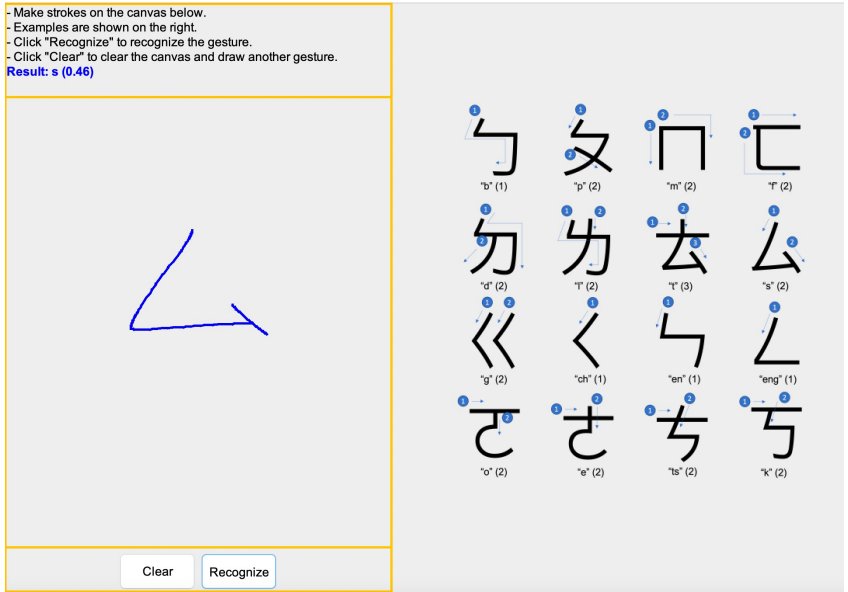
- Algorithm: $P
- Language: Java
- Existing dataset*: MMG
- New dataset*: Zhuyin Multistroke Gesture 12 people
- Analysis: user-dependent testing

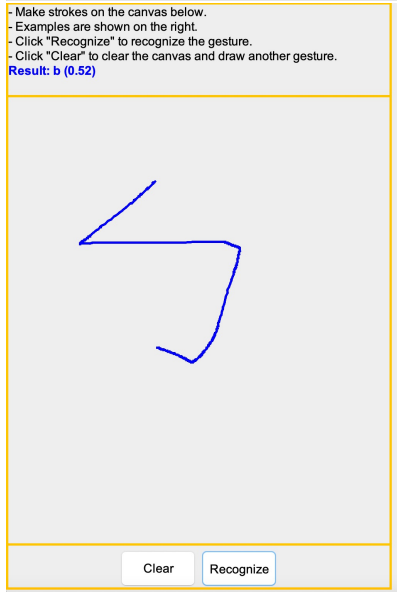
Online / Live Demo

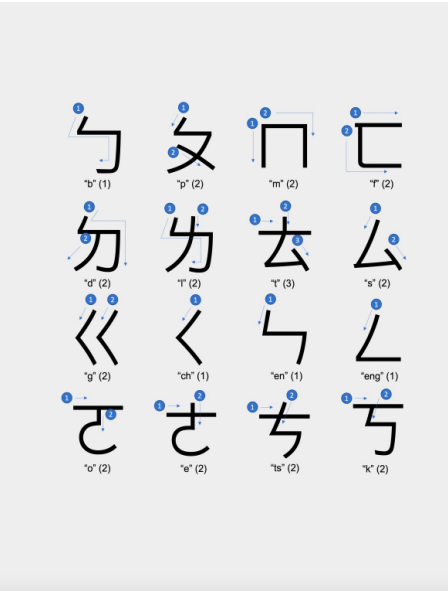




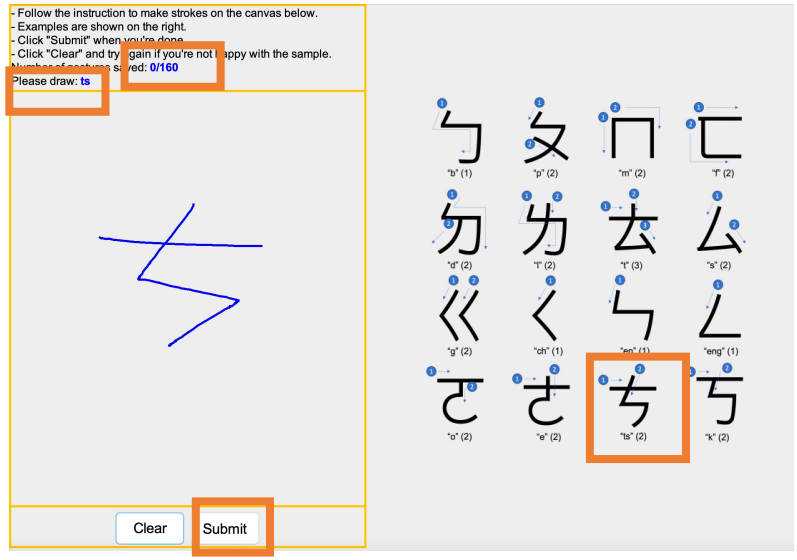


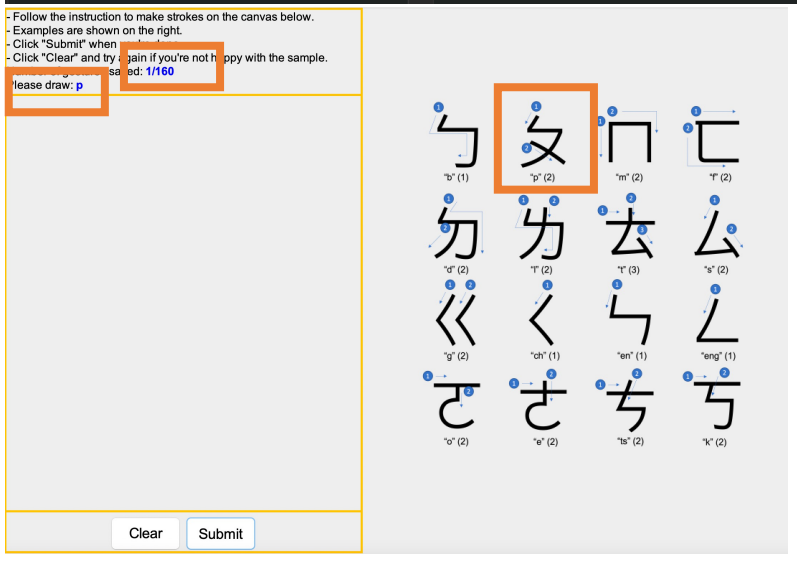


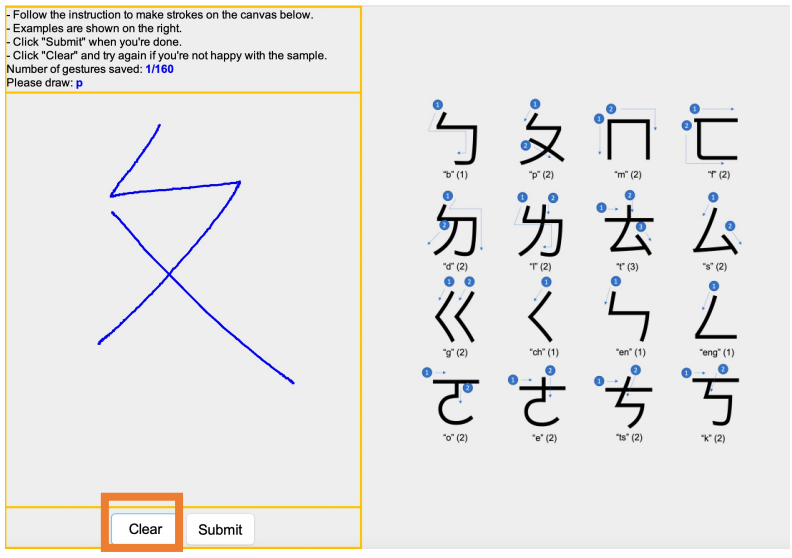


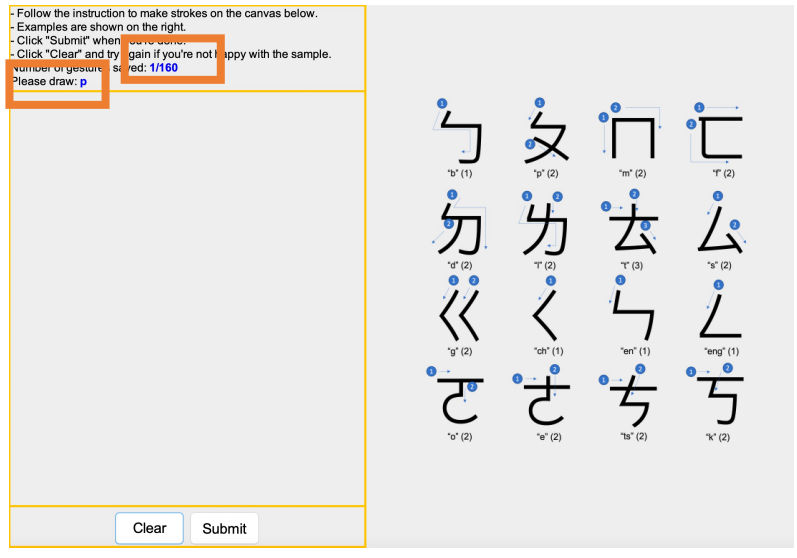


Collecting Data

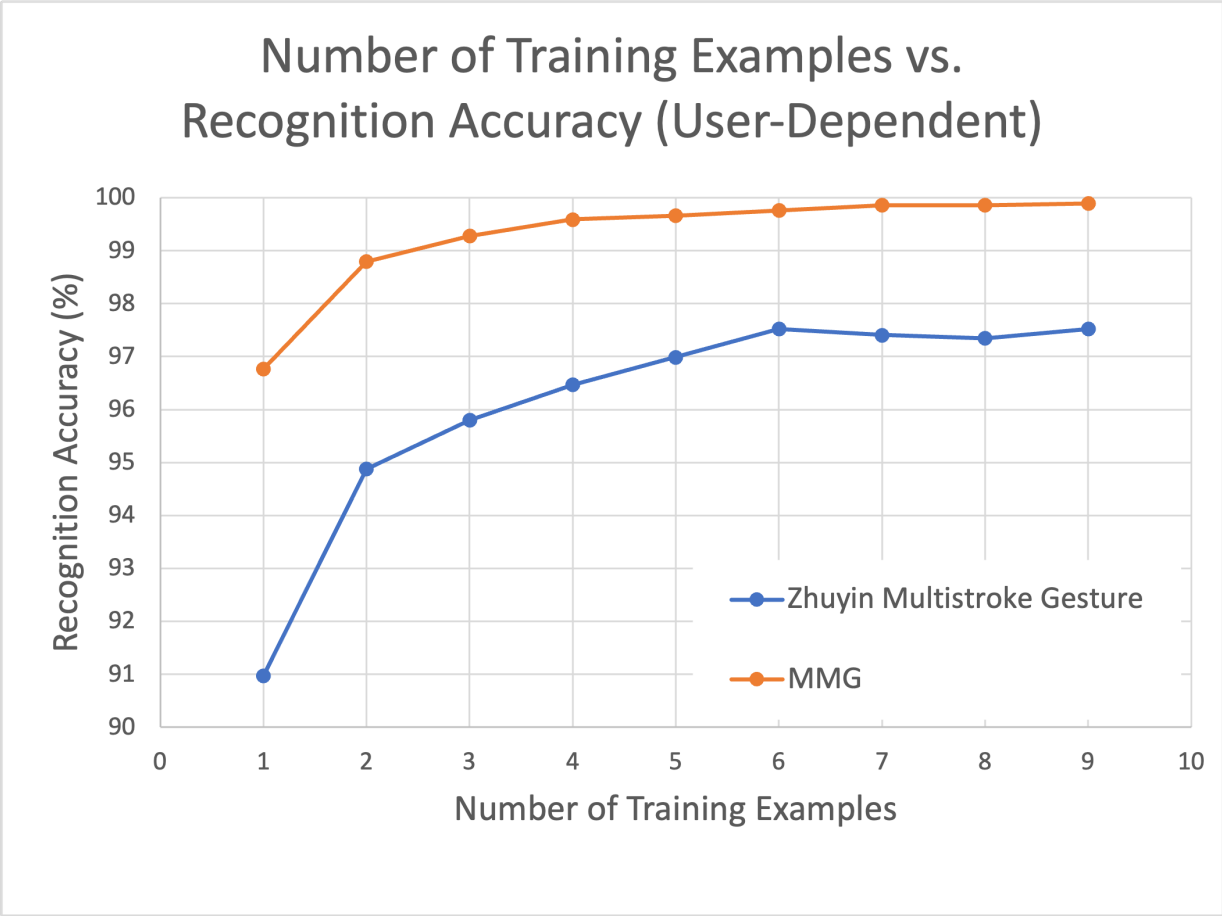




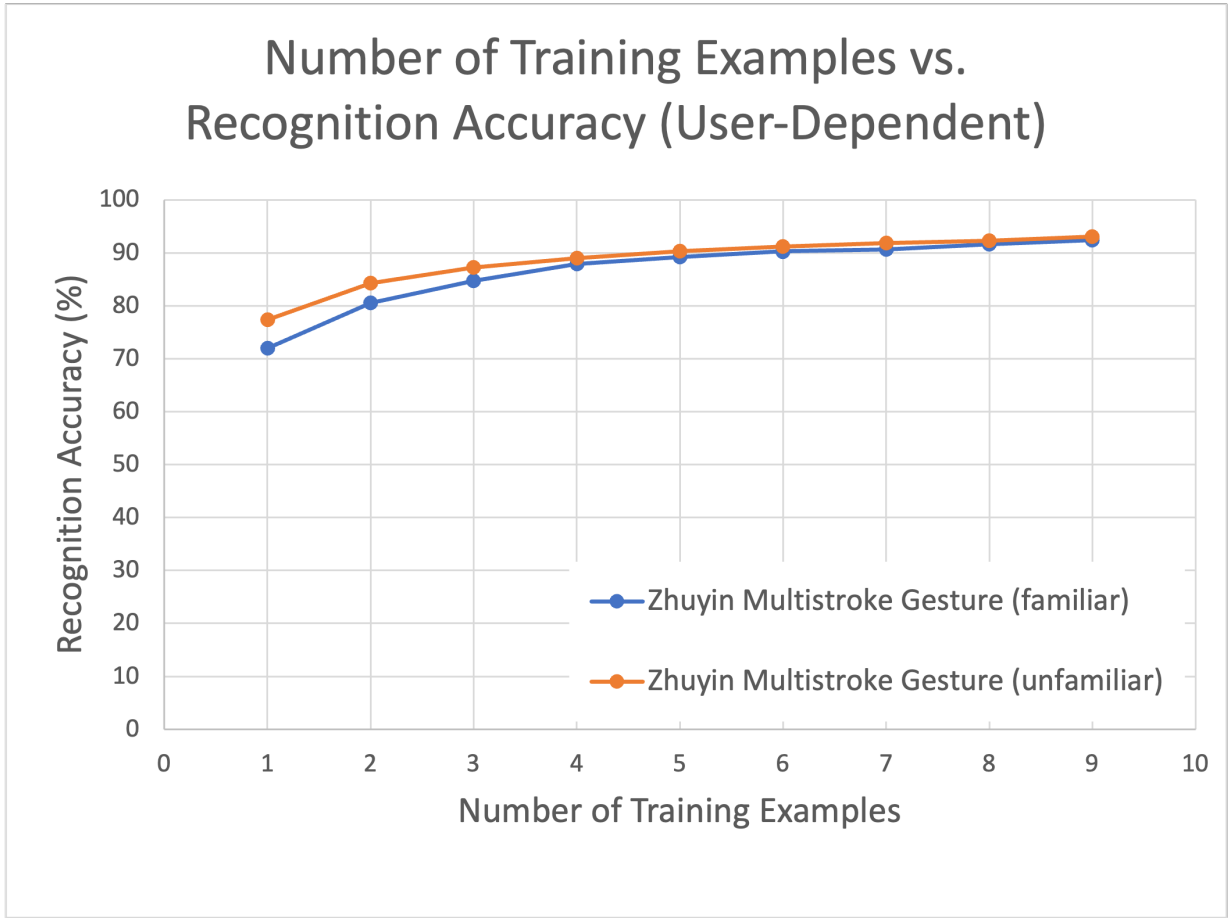




Offline Recognition Tests



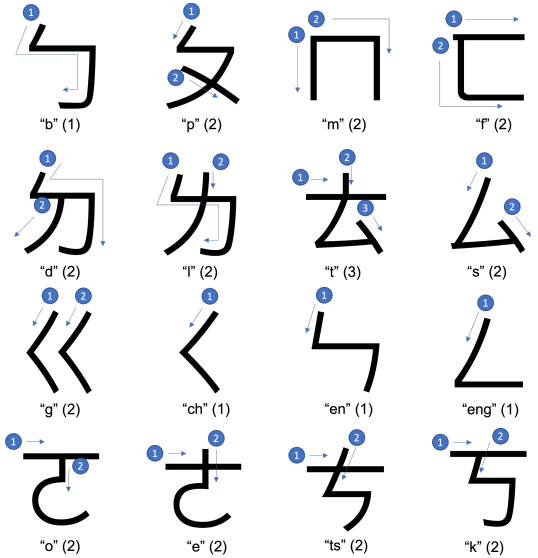
The comparison between the overall accuracies from the tests on two different datasets: 99.27 (MMG) > 87.50 (ZMG).

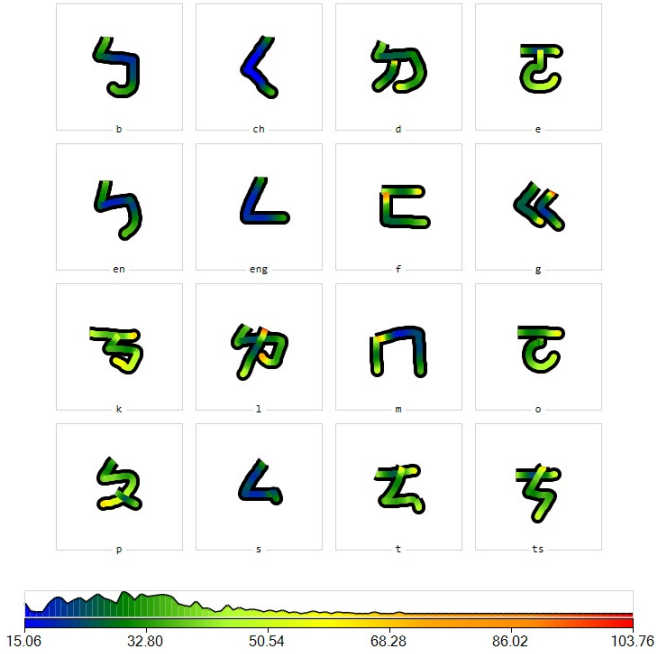


The comparison between the overall accuracies from the tests on two different groups of participants: 88.49 (unfamiliar) > 86.58 (familiar).

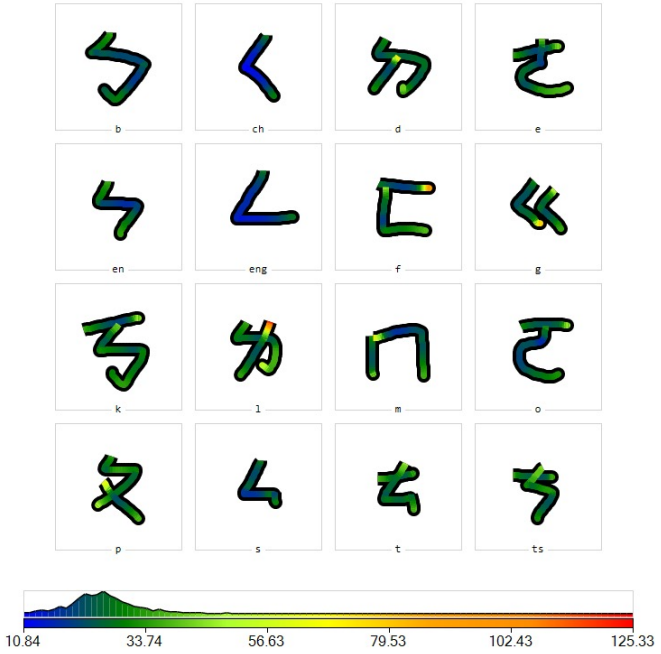
Analyses

- Zhuyin Multistroke Gesture
  - Overall
  - Familiar vs. Unfamiliar

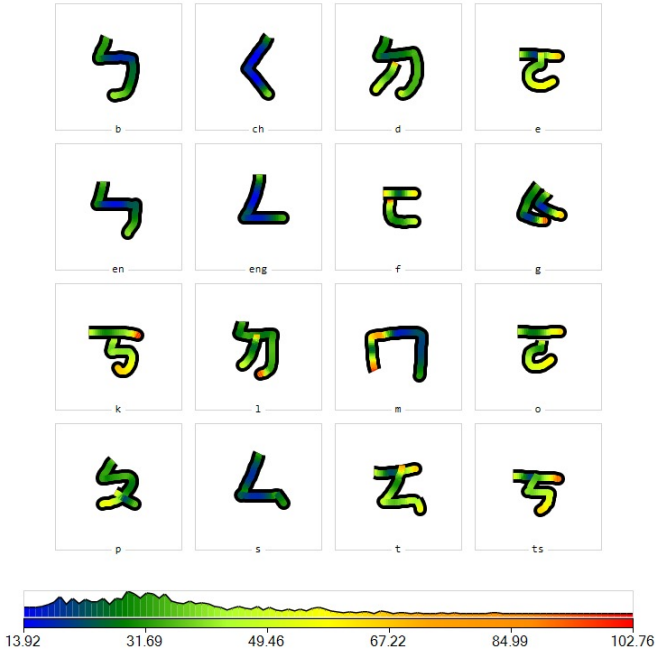




Overall: relatively low variation



Familiar: lower variation



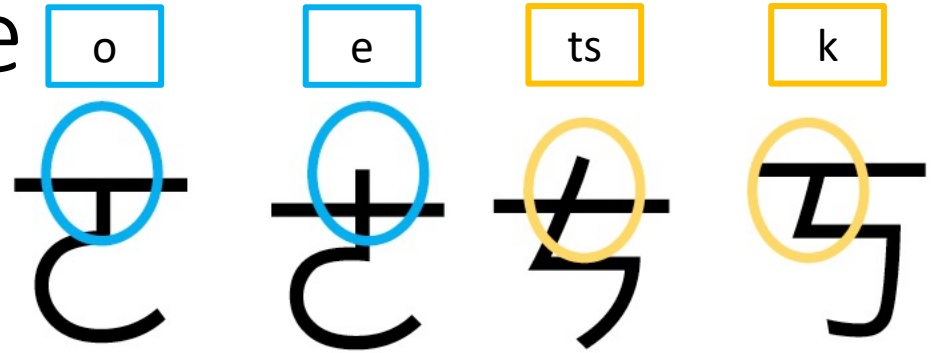
Unfamiliar: higher variation

Implementation and Challenges

- Live demo: JavaScript implementation → Java implementation
  - Look up documentation
- Difference between single stroke and multistroke
  - Add one more node (i.e., Stroke) in the XML file

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<Gesture AppName="PointClouds" AppVer="0.0.0.0" Date="Sunday, April 10, 2022"
    <Stroke index="1">
        <Point T="1649637251900" X="225" Y="307"/>
        <Point T="1649637251905" X="224" Y="306"/>
        <Point T="1649637251908" X="224" Y="305"/>
        <Point T="1649637251939" X="224" Y="307"/>
        <Point T="1649637251943" X="223" Y="308"/>
        <Point T="1649637251947" X="222" Y="309"/>
```

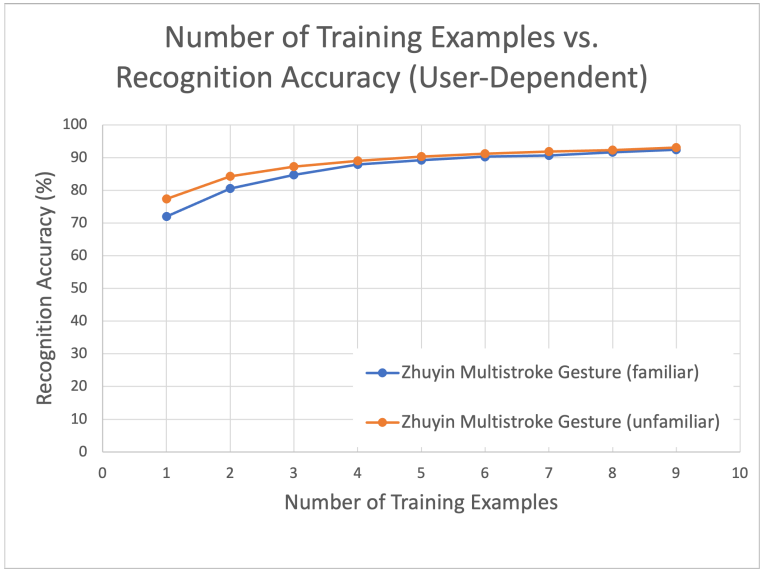
Predicted and Actual Outcome



- Similar symbols may lower the recognition accuracy

5	p155	e	1	1	16	{p155-b-8,p1	p155-e-5	o	0	0.32	p155-o-8
10	p155	k	1	1	16	{p155-b-8,p1	p155-k-5	ts	0	0.26	p155-ts-5
29	p155	o	2	1	16	{p155-b-3,p1	p155-o-7	e	0	0.47	p155-e-9
33	p155	ts	2	1	16	{p155-b-3,p1	p155-ts-9	k	0	0.32	p155-k-3

- Familiarity with the symbols may affect the recognition accuracy
  - Not significant
  - Maybe people who are not familiar with the symbols were more careful/consistent



Questions?