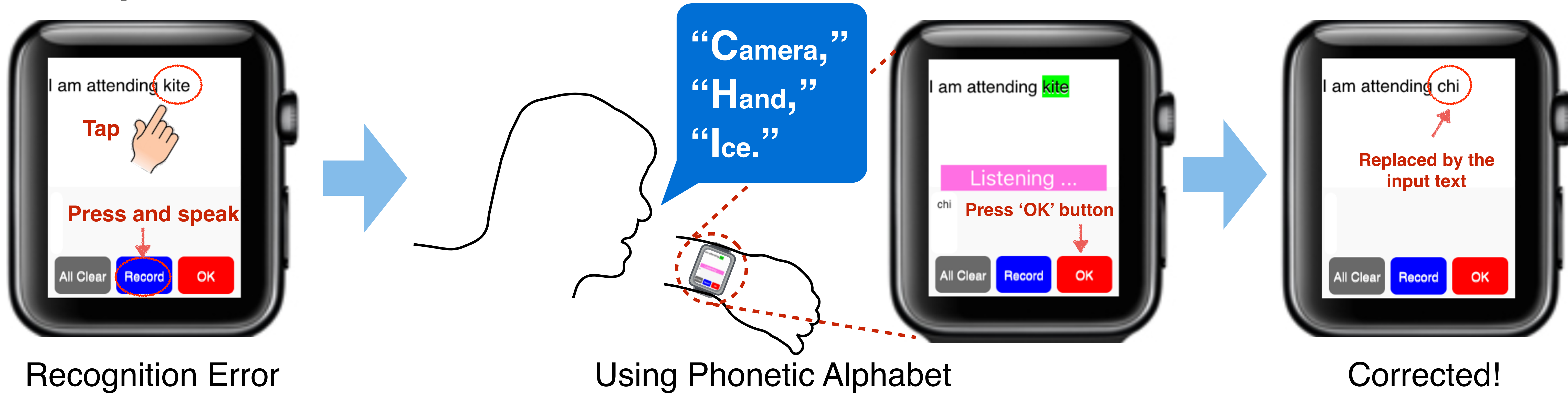


Error Correction of Speech Recognition by Custom Phonetic Alphabet Input for Ultra-Small Devices



◆ Proposed Method



◆ Contribution

- We used the phonetic alphabet for ASR error correction.
- We designed a custom phonetic alphabet for ASR.
 - ✓ using words familiar to non-native English speakers (easy to remember and pronounce)
 - ✓ easily distinguished by ASR

(ASR = Automatic Speech Recognition)

◆ Evaluation (N = 5)

- Tasks: Correcting ASR Errors

Task1: "Please send me the **fire**" (→ "**file**")
 Task2: "I'm afraid I can't attend **across**" (→ "**the class**")
 Task3: "We **have** snow this morning" (→ "**had**")
 Task4: "The order of these **wars** is not important" (→ "**words**")
 Task5: "You'll **and house** your vocabulary by reading the news" (→ "**enhance**")

(These recognition errors were actually observed in ASR.)

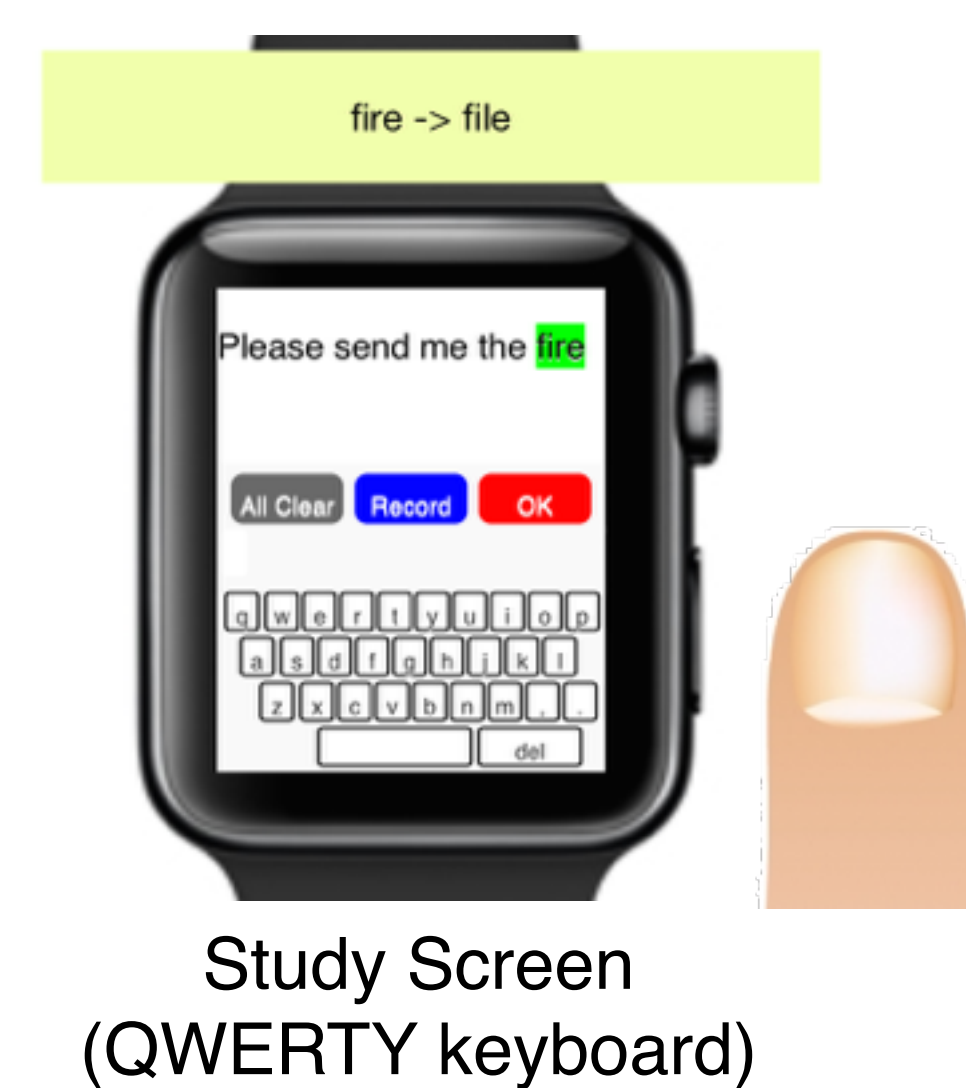
• Condition

- **Our method (our custom phonetic alphabet)**
- **NATO phonetic alphabet**
- **Direct alphabet-input** (e.g. saying "C, A, R" for "car")
- **QWERTY keyboard**

• Result

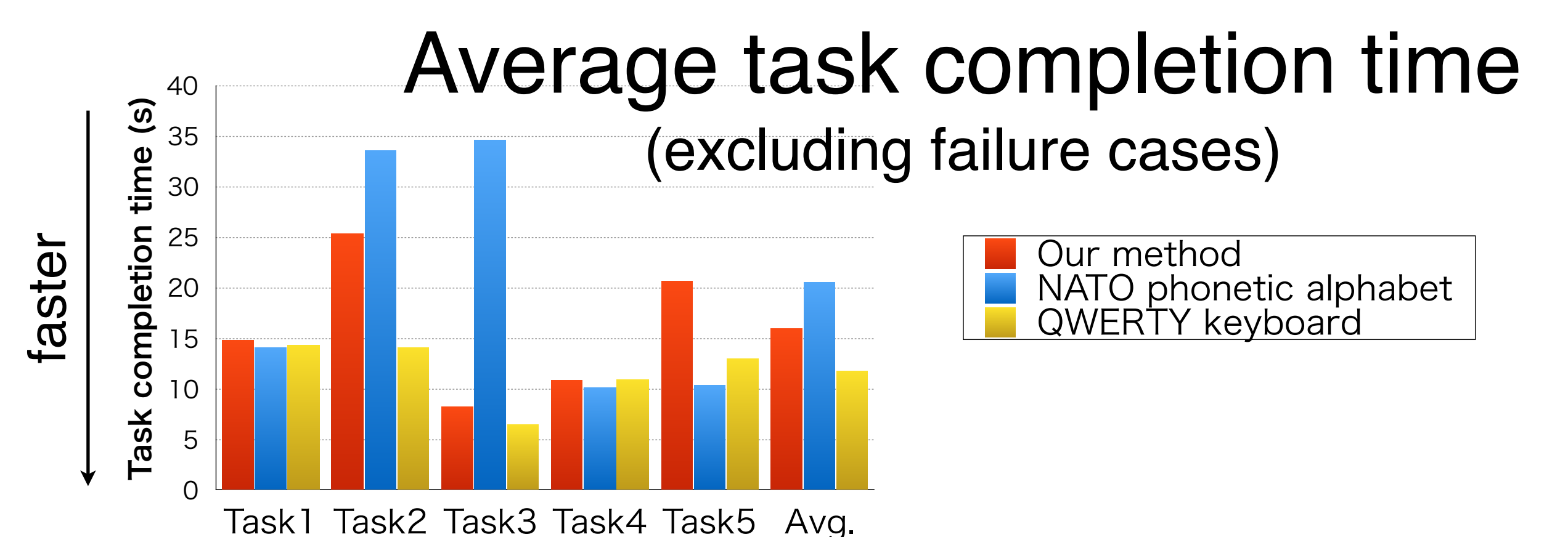
Success ratio within 40 seconds

Method	Task1	Task2	Task3	Task4	Task5	Avg.
Our method	100%	60%	80%	80%	60%	76%
NATO phonetic alphabet	100%	40%	20%	60%	20%	48%
Direct alphabet-input	20%	0%	0%	0%	40%	12%
QWERTY keyboard	100%	100%	100%	100%	100%	100%



A	Apple	Alpha
B	Bacon	Bravo
C	Camera	Charlie
D	Doctor	Delta
E	Ear	Echo
F	Fox	Foxtrot
G	Game	Golf
H	Hand	Hotel
I	Ice	India
J	Jack	Juliet
K	King	Kilo
L	Lucky	Lima
M	Money	Mike
N	Nest	November
O	Orange	Oscar
P	Park	Papa
Q	Queen	Quebec
R	Rabbit	Romeo
S	Soccer	Sierra
T	Tour	Tango
U	Uncle	Uniform
V	Violin	Victor
W	Wine	Whiskey
X	X-ray	X-ray
Y	Young	Yankee
Z	Zoo	Zulu
[SPACE]	Space	

Our Custom Phonetic Alphabet NATO standard Phonetic Alphabet



Our method was more successful and faster than NATO phonetic alphabet!

◆ Conclusion

Using phonetic alphabet is one of the effective ways to correct errors. Our study showed our custom phonetic alphabet enables users to input text faster and more accurately than other methods for ASR.

Please visit this page for more details!