Science and Technology Enrichment Program (STEP)
Enabling Input on Tiny/Headless Systems Using Morse Code
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Introduction
- Exploratory research on using Morse Code [1] as an alternative way of input
- Specifically for:
  - Smaller/tiny devices, e.g., smartwatches, etc.
  - Devices without screens/headless systems (IoT)
  - Novel devices, e.g., smart glasses, etc.
- Accessibility
  - Individuals with disabilities
  - The elderly
  - Assistive devices, e.g., wheelchairs, etc.

Summer Research Overview
- Involved in a longitudinal study investigating learning of Morse Code on mobile devices—users typed on smartphones with a Morse Code, with the assistance of a cheat sheet
- Purpose was to gain a better understanding of the learning curve within Morse Code input
- Findings of this study can inform the design and development of Morse Code-based text entry techniques for smaller devices
  - We initiated a project on the design & development of such a technique

Discussion/Conclusion
- Initial results suggest that a carefully designed Morse Code Keyboard can be an effective method for text entry on tiny and headless devices
- Users with physical disability may find it easier to enter text with a method that enables them to input with short and long taps, representing dots and dashes, respectively, by
  - Eliminating the need for using a grid of keys
  - Reducing task load

Future Work
- The intern’s1 exposure to new ways of inputting information into smaller devices has led her to identify new research questions on the accessibility of technologies
- The intern intends to create applications to enable groups, such as the elderly who were previously left behind in the technological advancements, to participate in the digital world through simplified and redesigned keyboards

Results
- Error Rate of Morse Keyboard
  - In the week-long study (10 participants x 5 sessions) the average error rate decreased from 9.5% to 3.4%
- Speed of Morse Keyboard
  - After one week of using Morse Code, the average entry speed increased from 4.7 to 6.9 words per minute

References

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