mBrailer: Multimodal Braille Keyboard for Android

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Introduction
Typing and editing using touchscreens is difficult for blind and low-vision smartphone users. Software keyboards aren’t user friendly and time consuming. Carrying additional hardware can also be unwieldy. The goal of this prototype is to offer the accuracy of a physical keyboard with the flexibility of software keyboards for blind and low vision smartphone users.

“Can smartphone typing and editing be easier for blind and visually impaired people if we think beyond just the touchscreen?”

Hardware Keyboard
Buttons are attached to the back of the phone using all four fingers to type Braille chords.

Materials
The mBrailer prototype is an Android software keyboard service, replacing the system keyboard. It connects to an Arduino Uno microcontroller using the Amarino communication library. Eight buttons are connected to the Arduino which translates each button press into typed characters.

Software Gestures
The thumbs take over the screen since the rest of the fingers are on the back of the phone. By pressing and swiping the phone can now respond to editing features much quicker.

Key Features
mBrailer combines a hardware Braille keyboard and software for advanced features. It uses the text to speech function already built into the operating system.

Future Work
- Sharing the code and recommended keyboard layout with other researchers and people who can use this solution.
- Increase the amount of gesture operations.
- Obtain user feedback and preferences for design decisions: software and hardware.
- Develop different physical keyboard technologies for back of phone typing.

Software Sources
This project uses the following open source software:
- Amarino Toolkit: http://www.amarino-toolkit.net/
- Android OS: https://source.android.com
- Arduino: https://github.com/arduino/Arduino
- OpenBraille Input Method: http://braille21.computing.dundee.ac.uk/

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