Typing without Touch: A Touchscreen Accessible Device for the Visually Impaired

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As a result of the many challenges blind people face in regards to touchscreen technology, proper assistive technology is essential for making touchscreens accessible to them. Screen readers allow blind people to know what items are being selected on the screen, but using the touchscreen's keyboard is still inconvenient. A very limited number of glove-like devices have been created to enable the visually impaired to type on touchscreen devices, but they either require a hard surface for the user to press on, or require the user to learn a new set of gestures for typing on the device. Since Bluetooth and screen reading software already exist, and can be incorporated into a commercial product, the goal of this project was to create a convenient pair of sensory gloves that enables blind people to create alpha-numeric characters through the motion of their fingers in mid-air. The device served as a Braille keyboard, comprised of flex sensors under each finger. When a flex sensor is flexed, it accompanies an increase in resistance that was interpreted by an Arduino microprocessor and converted into a character. Accuracy and usability were determined by two blind subjects who tested the gloves and answered a survey. Between the subjects, the device had an overall accuracy of 89%.

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