Keyboardists

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Needs statement

Those with tremors or motor function impairments (such as Parkinson's) experience trouble when interacting with traditional computer peripherals (namely a keyboard). Therefore, as use of technology becomes more prevalent, there exists a need for a simple assistive technology that provides better computer hardware accessibility to individuals with limited motor function. Existing assistive technologies are often too restrictive for those with mild to moderate motor function impairments (such as eye-trackers) and tend to sacrifice efficiency for the user. As a result, there is a need for a more traditional form of interaction that is easier for those with mild impairments to utilize. There also exists a need for a more affordable solution to this problem, as assistive devices can cost upwards of thousands of dollars, making them unattainable for a large section of the population.

Goal and objectives

The goal of a potential solution would be to make the typing experience easier for those who have motor function impairments. The solution should be cost-effective, accessible, and should also improve the experience of interacting with their computer (namely typing or otherwise inputting text). Priority must be placed on ensuring the solution is easy to learn, as a large percentage of those with motor function impairments are typically older in age and likely to be less proficient with computers. Therefore, avoiding the need to install device drivers or other software is preferable. The solution should also be generic enough to be customizable depending on the specific needs of each user (like variable actuation force or form factor). The design should not compromise any of the abilities present in a normal keyboard. Ideally, a solution would add to a normal keyboard's capabilities. The aim of these capabilities should be to reduce the user's opportunity to make mistakes while typing and improve their typing speed. Another important objective is to keep the solution as cost effective as possible in order to keep the product in reach of the general user.

Design constraints and feasibility

Several constraints presented in the needs statement involve the price, functionality, and compatibility of the product. In terms of price, we aim to deliver a final product that does not exceed $100, though development of a prototype will likely exceed this amount. Additionally, users will ideally be able to set up and take advantage of core functionalities of the product on their own. We also want the user to be able to use this product with any computer in a variety of settings, so it must be reasonably portable and compatible across Linux, Windows, and Mac. To do this, our solution will be based on existing technologies with the

form factor of a standard USB-A, QWERTY American-English keyboard. Lastly, our development time is constrained at 10 weeks. We have determined that a majority of these constraints are feasible given our technical expertise, but our biggest challenges will likely be the final cost of the product and limitations on development time.