Creating an Assistive Technology for People with Orthographic Dyslexia by Reducing the Orthography Depth of Internet Web Pages

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Dyslexia is a neurological condition that affects approximately 15% of the world's population and is defined as a difficulty in learning to read. English is more difficult to read for people with dyslexia because there is more than one sound for every letter (Deep Orthography). Language systems like the International Phonetic Alphabet (IPA) are easier to read for people with dyslexia because there is only one sound for every letter (Shallow Orthography). The goal was to create a Chrome extension that takes the text on a web page and convert it to IPA in order to improve comprehension of the text by reducing orthography depth. The extension was independently created using JavaScript and a functionality and performance test were conducted. Additionally, a survey was taken by 30 speech pathologists in order to analyze the overall effectiveness of the extension. Using a Spearman Rho test, it was found that all of the survey questions had a significant correlation. While using the extension, it was found that an average of 91.88% of words on a webpage were converted using the student created dictionary and only needed to access the online dictionary 8.12% of the time. Additionally, it was determined that the extension’s loading time adds an additional 66.68% of the time it takes after the webpage fully loaded. In the future, an auditory output can be included to assist people with phonological dyslexia and can be integrated into cameras and smart devices so that this application can be used in real time.

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