Demo: Dyslexic and Private Reader

An Eye-tracking Platform for Reading Interactions with Applications to Increase Empathy and Privacy

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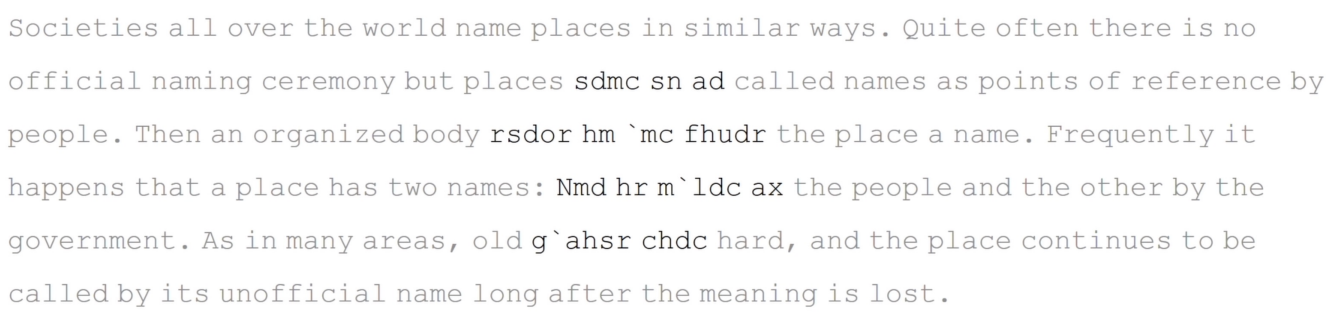

Figure 1: Dylexic Reader Concept: Making it harder to read text by simulating the experience of a person having a specific type of dyslexia.

ABSTRACT

We present a demonstration based on a MobileHCI 2019 paper to use eye gaze to selectively render or obscure text. Obscuring is used to "simulate" a specific kind of dyslexia. Selectively render text is to give users a more private reading experience in public spaces.

KEYWORDS

datasets, neural networks, gaze detection, text tagging

ACM Reference Format:
Kirill Ragozin and Kai Kunze. 2019. Demo: Dyslexic and Private Reader: An Eye-tracking Platform for Reading Interactions with Applications to Increase Empathy and Privacy. In *Adjunct Proceedings of the 2019 ACM International Joint Conference on Pervasive and Ubiquitous Computing and the 2019 International Symposium on Wearable Computers (UbiComp/ISWC '19 Adjunct), September 9–13, 2019, London, United Kingdom.* ACM, New York, NY, USA, 2 pages. https://doi.org/10.1145/3341162.3343788

UbiComp/ISWC '19 Adjunct, September 9–13, 2019, London, United Kingdom

ACM ISBN 978-1-4503-6869-8/19/09…$15.00
https://doi.org/10.1145/3341162.3343788

1 INTRODUCTION

Reading together with writing is one our most significant technological inventions. However, digital reading hasn't yet changed much compared to the offline version. We are working on research to incorporate the user's current state into the reading experience [1–3].

This demonstration of a platform used for an accepted full paper at MobileHCI titled "Private Reader: Using Eye Tracking to Improve Reading Privacy in Public Spaces." We developed Private Reader, a method to reduce comprehension, increase frustration for the observer yet maintaining readability for the user (not impacting the reading speed). Compared to the publication, we present not only the Private Reader modes to improve privacy but also Dyslexic Reader, a mode making it harder to read to experience a specific kind of dyslexia, in which a person has a hard time focusing on words as it seems to them the letters jump and change position [4].

2 DEMONSTRATION

We use eye tracking to render only the word a user is currently reading as a core concept. Current commodity eye-tracking devices cannot provide this level of accuracy; we need to also change a couple of words around the user's gaze.

Figure 2: The demonstration system. A Windows tablet with Tobii 4C attached.

Figure 3: A user reading on the system, while an observer trying to sholder surf.

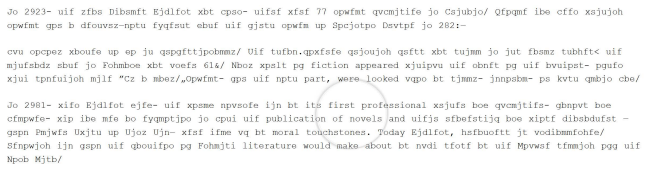

Figure 4: The private reader mode. The bubble shows the current eyegaze position of the user and is just added for illustration purposes

We present two basic applications: Dyslexic and Private Reader. Dyslexic Reader renders part of the words a user is trying to read into gibberish, making it harder for the user to read the text. This is to simulate a specific type of dyslexia and is to help users to better understand what it means to have this disability.

Private Reader renders text outside of a gaze bubble as scrambled text, where a word looks like a collection of random letters.

Figure 2 shows the prototype system implemented and used for the user studies. We use a Windows Surface Pro 6 Tablet with a Tobii 4C eye tracker attached. We obtained a Tobii 4C research license to use the system for this publication. The Tobii 4C is a standard commercial eye tracker with an approximate sampling rate of 60Hz for the gaze data.

Figure 3 shows a user reading with the system and an observer looking over the shoulder.

Figure 4 gives you a glimps on the Private Reader mode (compared to Dyslexic Reader in Figure 1). Only the words in the gaze bubble are displayed correctly the other words are scrambled and flash with the users reading speed.

The users will have the possibility to try out both Dyslexic and Private Reader, an interaction (explaining the concept and reading a couple of lines) usually takes about 2-3 minutes per person.

We are looking for collaborators to share our technology and continuing with the development. The code for Dyslexic and Private Reader will be open-sourced.

ACKNOWLEDGMENTS

This work was partly supported by the JST CREST Project on Experiential Supplements, Grant No. JPMJCR16E1.

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