Building a Virtual Readability Lab

Readabilitylab.xyz <> bendsawyer.com <> sawyer@ucf.edu
Ben D Sawyer, PhD
Assistant Professor, Industrial Engineering & Management Systems

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STA-3032, Statistics for Engineers
EIN-6298, Human-Computer Interaction

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Virtual Readability Lab

How can we leverage digital ‘layers’ to enhance human perception?

- ‘Lab-in-the-wild’ connecting individuals to their best format
- Over 5000 individuals have participated to date
- Fast Company Magazine recognized

The Readability Consortium

- Working to redefine digital reading interface through enhanced readability
- Members & UCF collaboratively identify & prioritize research objectives
- The first industry-nonprofit,-university dues-based consortium at UCF

readabilitylab.xyz
thereadabilityconsortium.org
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The great typography bake-off: comparing legibility at-a-glance

Ben D. Sawyer, Jonathan Dobres, Nadine Chahine and Bryan Reimer

Department of Industrial Engineering & Management Systems, University of Central Florida, Orlando, FL; Institute for Simulation and Training, University of Central Florida, Orlando, FL; Massachusetts Institute of Technology, Cambridge, MA; Monotype Imaging, Woburn, MA

ABSTRACT

Typography plays an increasingly important role in today's dynamic digital interfaces. Graphik designers and interface engineers have more typographic options than ever before. Sorting through this maze of design choices can be a daunting task. Here we present the results of an experiment comparing differences in glance-based legibility between eight popular sans-serif typefaces. The results show typography to be more than a matter of taste, especially in safety critical contexts such as in-vehicle interfaces. Our work provides both a method and rationale for using glanceable typefaces, as well as actionable information to guide design decisions for optimised usability in the fast-paced mobile world in which information is increasingly consumed in a few short glances.

Practitioner summary: There is presently no accepted scientific method for comparing font legibility under time-pressure, in 'glanceable' interfaces such as automotive displays and smartphone notifications. A bake-off method is demonstrated with eight popular sans-serif typefaces. The results provide actionable information to guide design decisions when information must be consumed at-a-glance.

Keywords: Reading attention; Usability; Font glanceability

Introduction

It was 12 years ago that Steve Jobs introduced the modern smartphone to the world, and in that brief time mobile computing has become the centre of our attention. Low-resolution screens, once restricted to our desks, now offer high definition imagery and messages in our pockets, on our wrists, in our cars, and even perched on our faces (Sawyer et al. 2014; Beckers et al. 2017). Such ubiquitous screen real estate has changed both user expectations and interaction. Elegant, intuitive interfaces that communicate clearly and quickly have become the norm in modern computing. Even scrolling lists of text, such as times and tasks, involve consequences ranging from the inconvenient to the fatal (Reimer et al. 2014; Sawyer et al. 2014; Beckers et al. 2017). The human tendency to multitask makes it imperative that digital information be delivered efficiently; every moment spent fuddled away from important situational information makes failure at a task more likely. Typographic choices can have a payout, or a cost, and so digital text plays a crucial role in the war for our limited attention.

Font, color, contrast, size, layout; these fundamental choices define an extremely complex 'design space', even in a simple interface. Designers face functionally limitless opportunities and choices, and must therefore consider many factors in the design process.
just finding the right format

BIG JUMP
speed + comprehension

SLOWEST FONT  FASTEST FONT
35 HOURS      18 HOURS

WAR AND PEACE
(Based on an average reader in our top 25%)

ZERO TRAINING BUT PERSONALIZATION REQUIRED
Virtual Readability Lab
readabilitylab.xyz

Find what works best for you!

Take our 5 minute tests

Favorite Font
Do you prefer this font or this one? We pit pairs of fonts against each other until we can proclaim one font victorious.

Start Test

Fastest Font
Which font do you read fastest in? We give you a set of short reading passages in different fonts to test the best font for you.

Start Test

Best Spacing
Does increasing or decreasing the spacing between letters help you read better? Try this study to find out!

Start Test

276 WPM
AVERAGE READING SPEED PER USER

239 WPM DIFFERENCE

FASTEST USER

PREFERRED

TIMES
NOTO SANS

ALL RESULTS

TOP QUARTILE 88/352 USERS
Diverse format changes

- Font family
- Font size
- Character spacing
- Line spacing
- Stroke width
- Kerning
- Polarity
- Variable fonts
Optimizing Electronic Health Records Through Readability

Rachel V. Bell, Dave B. Miller, Shaun Wallace, more...

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Abstract

Medical professionals engage in an enormous and ever-increasing amount of electronic health records (EHRs), which may have adverse impacts on patient care. New technology may help to accelerate reading these records, without training, and comprehension in this critical task. Using history of present illness (HPI), we investigated how personalized fonts impacted medical text reading speed. Workers without medical training read a set of eighth-grade level paragraphs with their fastest and slowest fonts, which were then used to display a comprehension question. Results showed that PRFs accelerated reading while maintaining comprehension. This finding suggests that individual-specific font optimization may be a straightforward way to optimize future in which PRFs may help physicians in reading medical information.

Glanceable, legible typography over complex backgrounds

Ben D. Sawyerab, Benjamin Wolfe, Jonathan Dobres, Nadine Chahine, Bruce Mehler, and Bryan Reimer

*Industrial Engineering and Management Systems, University of Central Florida, Orlando, FL, USA, *Aptlab, Massachusetts Institute of Technology, Cambridge, MA, USA, *Computer Science and Artificial Intelligence Laboratory, Massachusetts Institute of Technology, Cambridge, MA, USA, †TactilTypo, London, UK

ABSTRACT

Modern digital interfaces display text in ways never seen before. In the past 50 years, the common practice of typography has evolved from traditional forms to increasingly short-form. In safety-critical settings, such as reading medical reports with the need to understand the environment. To keep both type and the environment legible, a variety of middle layer approaches are employed. But what is the best approach to present type over complex backgrounds so as to preserve legibility? This work tests and ranks middle layers in three studies. In the first study, the user initiated a variety of interactive 3D models, and middle layer techniques best maximize legibility. In the second, a visual display of the middle layer and middle layers with, results showing different results. Results in mixed reality (MR) including overlays, virtual reality (VR), and augmented reality (AR) could create a future in which glanceable reading amid complex backgrounds becomes a reality.

Practitioner summary: Typography over complex backgrounds, meant to be read and understood at a glance, was once niche but today is a growing design challenge for graphical user interface (GUI). We provide a technique, evidence-based strategy, and illuminating a method for maximizing legibility of glanceable typography over complex backgrounds.

Abbreviations: AR: augmented reality; VR: virtual reality; HUD: head-up display; OLED: organic light-emitting diode; UI: user experience; MS: milliseconds; CM: centimeter
Machine Learning Approaches to Rapid Information Individuation on Digital Devices

Information Individuation in Extreme Environments

Information Design in Environment Visualization for Multi-Domain Operations
Academic Excellence Proposal: Bringing Digital Readability to All at UCF

We propose integration of our UCF-developed, award winning, industry-backed readability technology into UCF’s digital learning infrastructure.

Internal Proposal: Improving Student-teacher Interaction in Composition at UArizona

All undergraduate composition classes will include readability technology, enhancing University of Arizona digital infrastructure and improving student-instructor feedback cycles.

Virtual Readability Lab technology

- is open-source
- will be trialed at multiple institutions
- instantly enhances individual reading speed and comprehension
- has implications for students and instructors
- may enhance student retention, progression, graduation, and career success
- provides opportunities for big data toward ‘metrics for success’

Readabilitylab.xyz <> bendsawyer.com <> sawyer@ucf.edu
Who would be a good candidate to join The Readability Consortium?

Contact: Dr. Ben D. Sawyer
bendsawyer.com
sawyer@ucf.edu

Join us!

Seeking collaborators in:
- instructional design
- machine learning (computer vision, time series, GAN, beyond)
- augmented reality & associated display technologies
- human-machine systems with digital displays
- domain expertise in likely domains
  - Medical, Battlefield, Security, beyond?

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Partner with the Laboratory