

A Passion for Communication

When I was young, my parents were sent to different parts of the world by their engineering firm. I grew up in different environments, each having different languages, accents, gestures, and writing. This got me thinking about the ways in which people communicate, and the importance of communication in the world. Later in life while studying at university, I realized that I process visual information better than written or verbal communication, and this fact greatly affected my career path. I wondered why there weren't school textbooks that communicated math, science, and literature in more visual ways.

Reflecting on these memories made me question why written text looks the way it does, and whether our current form of written language is the most appropriate for communicating with each other, given that most of our reading and writing happens on digital devices. Our computers have evolved far beyond just being able to display text, and perhaps it is time to think about how we might evolve our writing system for the digital age.

How Written Language Is Influenced by Technology

We have grown up in a world where written languages are already established and don't undergo significant change. The symbols that make up our languages (graphemes) were born in ancient times, enabled by ancient technology. The clay tablet, pen, and printing press were technological innovations that sparked a change in written languages around the world. Now that we have invented computers, we will likely see another big change in written language, which will affect how we read and write on digital devices.

Tool				
Writing				<p>We use an old form of writing on digital devices, but can we improve our writing to make better use of this new medium?</p>

A New Evolution of Written Language

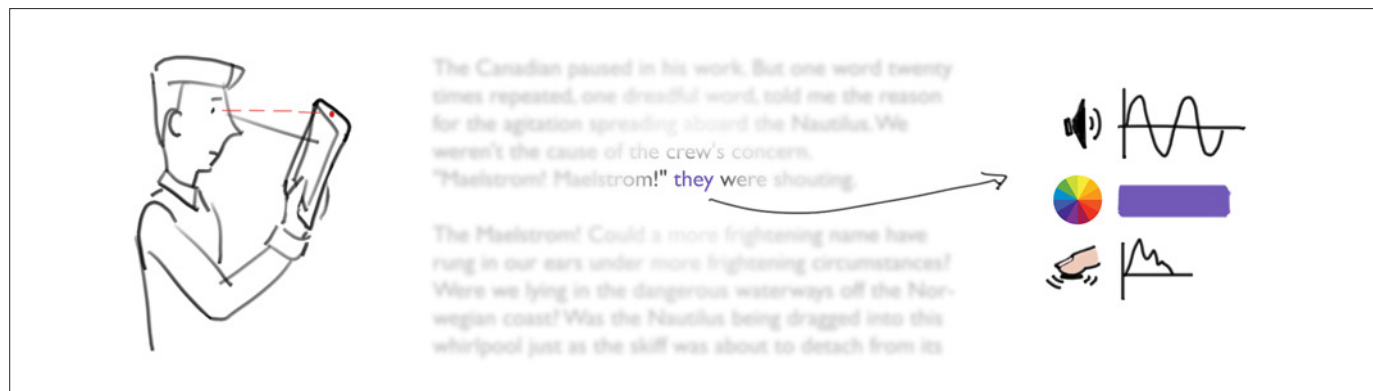
Some aspects of language, such as speech, grammar, and spelling, may take a very long time to evolve. On the other hand, the way in which we read and write language, as well as the graphemes of language, could change more quickly.

One way to improve written language would be to engage multiple senses while reading and writing text. Words could be encoded with different sensory information, which gets played back when our eyes glance over the words on a page. Another possible improvement would be to evolve the graphemes that we use in written language. We use letters, numbers, and symbols that were optimized for printing on paper, but what kind of graphemes would be better suited for computers? These ideas can be tested with current technology to find out if any improvements can be made to the way we communicate written language.

Augmenting Written Language

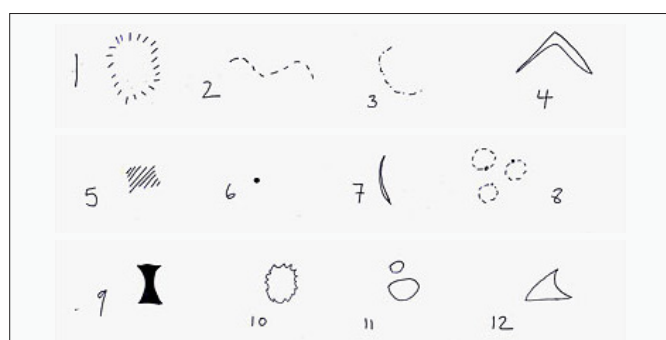
When we read, we only engage our visual sense. But what if words could engage more senses?

If our digital devices can track our eye movements, then a device would know which word we're looking at on the screen at any given time. If this is the case, as we read words on a digital device, the words could emit subtle sounds, colour, animation, patterns, or touch feedback. Eye-tracking is possible with a high-resolution camera, and we are rapidly approaching a time when these cameras will be built in to most of our everyday digital devices.



Using eye-tracking, as you read words on a page, the words can emit sensory information, such as sound, color, and touch feedback.

Being able to read text in a multi-sensory manner may have several benefits. First, it may enable us to better retain information. Some common memory aid techniques (mnemonics) engage multiple senses in order to remember information. As an example, Daniel Tammet, who holds the record for reciting pi from memory, says that in his mind each positive integer up to 10,000 has its own unique shape, colour, texture, and feel. In an augmented written language, each word could have similar sensory associations that would allow people to remember a piece of text better. Second, multi-sensory reading may help us stay focused. For instance, while reading in a busy environment, such as a classroom, there can be many distractions that compete for our attention, especially at a young age. By engaging multiple senses at once, a reader may be less distracted and more focused on the text. Finally, by augmenting written language, we could create a way to read that is more accommodating to people with sensory impairments. An example is someone with poor vision, who could read text better with the addition of auditory or tactile cues.



Drawings of Daniel Tammet showing how he visualizes the numbers 1 through 12.



Grapheme-colour synesthesia: a neurological phenomenon in which a person's perception of letters and numbers are associated with colours.

Testing and Outcomes

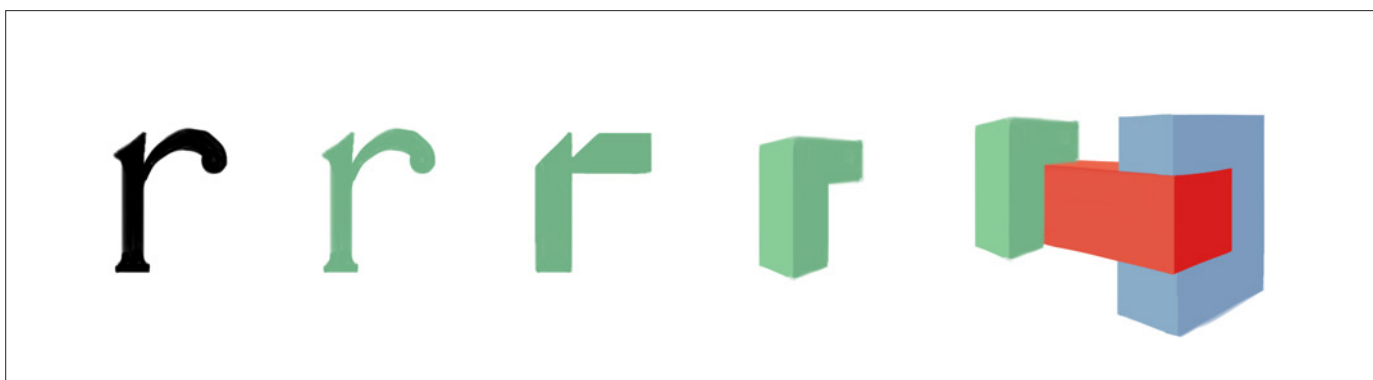
In order to test augmented written language, an application can be developed that takes input from an eye tracker and outputs different kinds of sensory information. In the initial phase of development, different kinds of sensory output can be researched, as well as the manner in which they'll be mapped to text. Mapping a sensory output to each letter, number, and symbol may be overwhelming, so mapping sensory output to words or parts of speech may result in a better user experience.

Once an application is built, it can be user-tested and improved upon. Testing would reveal which types of sensory output are beneficial, uncover possible use-cases for the application, and help with fine-tuning the application's parameters. To allow for reading different types of content, the application could be developed as a web browser extension, a plugin for an e-book app, or a stand-alone app. If the software is developed to work on any laptop or tablet, then it can be coupled with low-cost eye trackers to allow for long-term testing of reading augmented language. If tests are successful, the app can be prepared for a public release.

On the Future of Written Language

Looking towards the future, augmenting written language might be the first evolutionary step towards a new kind of grapheme. The current graphemes that make up most of the world's languages consist of black and white shapes that are strung together to form words and phrases, and then displayed on two-dimensional surfaces for reading. We are not limited to using this type of grapheme, however, and there are already a couple of well-known alternative graphemes that are being used today. The hand gestures of sign languages and the raised dots of braille are proof that people are able to learn very different sets of graphemes.

Computers enable a new type of grapheme, but we have not yet explored the possibilities. As an example, graphemes could be three-dimensional. They could be animated, colourful, and engage other senses, as well. In addition, digital graphemes are not limited to being arranged in two-dimensional space. They could have a different kind of spatial or temporal arrangement. For example, words could be displayed in a 3d space, and they could be shown sequentially like a video.



Thought experiment: what if letters were colour-coded 3D shapes? What would a 3D word look like?

Using new graphemes would also make it possible to develop new methods of input. Today we use QWERTY keyboards to type messages, but we struggle to invent technologies that significantly improve text input. If graphemes were to change, not only would this open up the possibility for new input methods, but the graphemes and input methods could be developed in tandem.

Conclusion

Having lived in different parts of the world and having worked as an interaction designer, I've spent a lot of time observing how people interact with each other and how they interact with digital devices. I developed the basic belief that if people can communicate better, then their lives can improve. If a thought can be communicated more clearly, then it will be understood better, leading to less conflict and confusion. Augmenting written language is a challenging prospect, but it could provide a better way for people to understand written text and create a new way of interacting with digital devices.