

Deliverable J User Manual

Submitted by

A03, Group 1

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Abstract

At the start of the fall semester, we've been given a task to use our engineering skills to try and solve one of the many problems that our society suffers from. Our project consists of making a screen reader for legally blind people to help them navigate through their electronic devices and read text off images. We have come up with a couple of innovative solutions that we showed our client upon multiple meetings. Based on their feedback, we did multiple iterations to try and make our product fit our client's needs as much as possible.

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List of Acronyms

Table 1. List of acronyms

Acronym	Definition
WebRTC	Web Real-Time Communication
NVDA	NonVisual Desktop Access

1 Introduction

Our client struggles with visual impairment, this makes his everyday task more challenging than the average person. Doing simple tasks, such as reading, are a challenge for our client and he needs to rely on screen readers for these tasks. Without these screen readers, everyday tasks would be nearly impossible for our client. And since the world is becoming more and more dependent on technology we fear that these people are going to be more overwhelmed in the future than they are already today. Our product is aimed to help those people have an easier time in the day to day life.

Since our project consists of a screen reader there is no doubt that the people that are concerned are visually impaired. But we believe that anyone can be interested in our project since we implemented the narration mode, which consists of a Trialogue employee reading off the screen of the user, it is recommended to use this mode when confronted with a big paragraph or when wanting a book to be read for you. So it is very likely that a parent for example would want one of our employees to read bedtime stories for their children or someone would simply prefer a book read to them rather than read it themselves.

We believe that the narration mode, which consists of a Trialogue employee helping the user navigate and read, is going to set us apart from our competitors since we've got really good feedback on that part of the project. Our client is bothered by the repetitiveness and boredom of the robotic voice that comes with regular screen readers. With the help of this mode of our product, the user is going to have a chance to not only understand what's in front of his screen but also enjoy the process of understanding it.

2 About Our Product

Features

The main feature that set our product Trialogue apart from the competition is our human aided mode. This allows the user to talk directly with a person instead of listening to the robotic voice of the average screen reader. Hearing feedback from our client about current products revealed that he would often get bored and tired of the sound of the robotic voice while listening to longer readings. Having a real person talk to the user would eliminate that problem as they are talking directly to another person. Our product has the functionality of a normal screen reader, however, it is just done through a person. Since we have an actual human reading the text we don't have the issue that the client had mentioned through meetings, which is that his current products can not read text off of images.

Prototype

Our final prototype uses Chrome's remote desktop extension and can be installed on any browser which makes it accessible to all users. With the help of a Trialogue employee, this extension will be installed on our client's computer with his or her newly created Trialogue Gmail account. After sharing with us the new account's information, a Trialogue employee will then open that same account on his or her browser when a call is made by our client and we will have the client's screen shared with us as long as they have an internet connection. We will then proceed to assist and guide our client in navigating his or her computer.

Health and Safety

In terms of health and safety, our group couldn't find guidelines or precautions for our project as our product is solely software-based.

Troubleshooting

We do not expect our clients to have many issues when using our solution but a help and support team will always be available for them.

Design Files

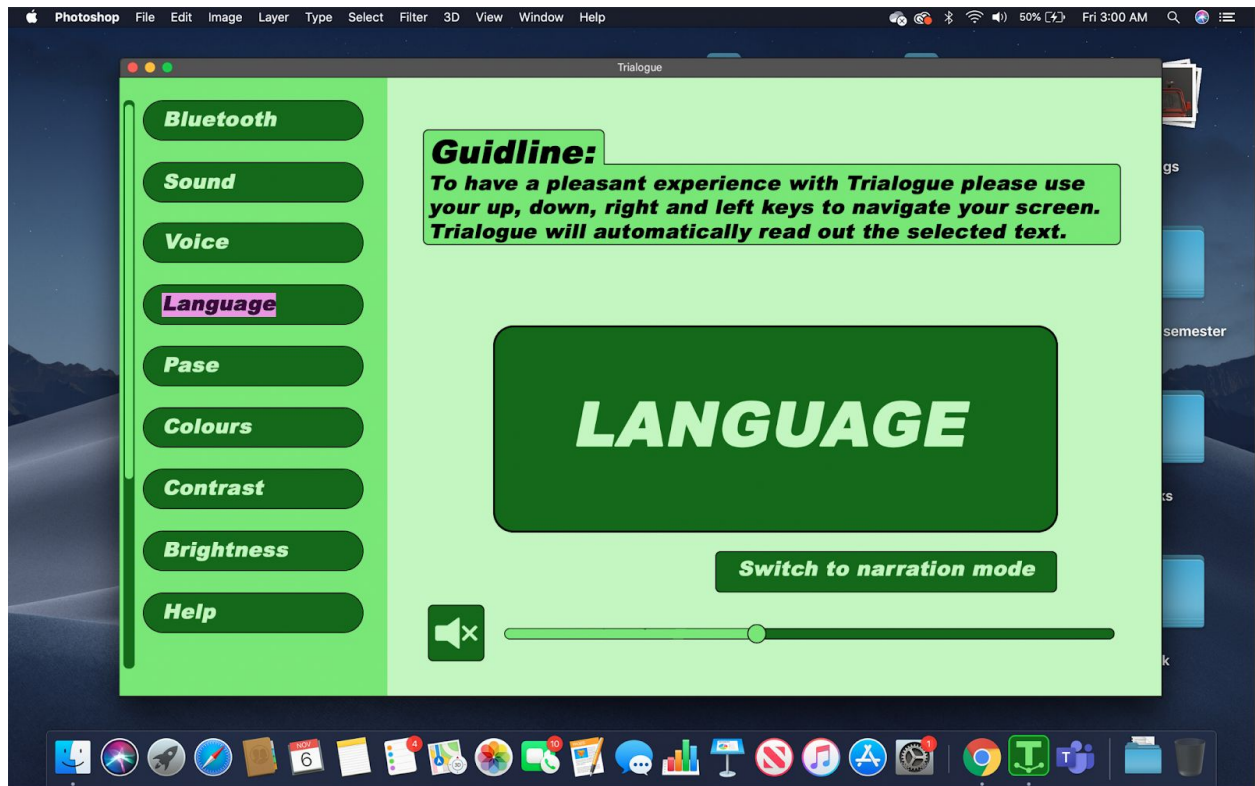


Figure 1. Fully software mode

The design shown above is what ideally our final product would have looked like. However, due to mainly lack of experience, but also human resources and time, it wasn't possible for us to achieve our desired design. We settled with making our final product fully human aided and not having this part of our final product. Ideally, this prototype would allow the user to have a wide range of settings to allow the user to make their experience as easy and as enjoyable to the user as possible. The user would also be able to create shortcuts to make navigating the app easier, along with a fast way to open the app when needed. The app would function by the user selecting a piece of text then the app will just read it out for you.

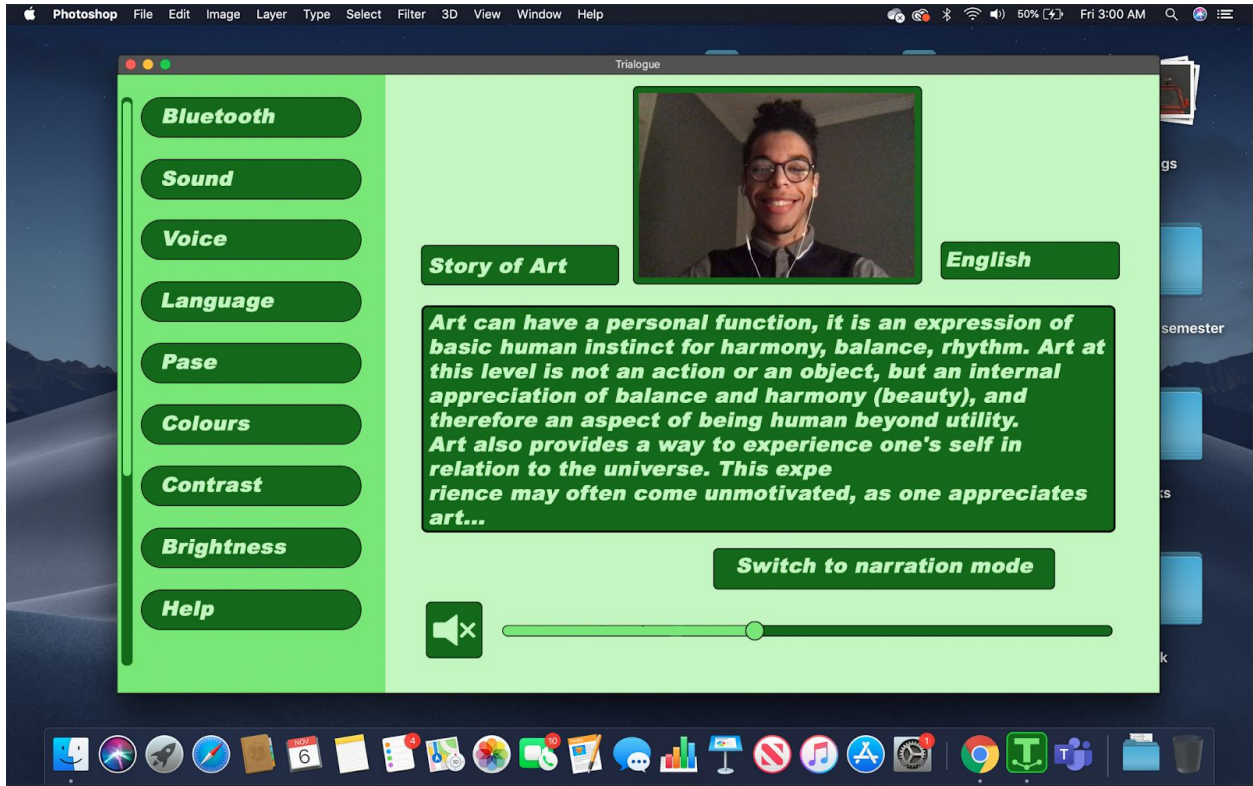


Figure 2. Human-aided mode

As mentioned above, due to some issues we couldn't get our final prototype to the design we wished to achieve. Our final design is more in line with the basic idea of this design, as our final design is human-aided. Our final design utilized chrome's remote desktop extension to allow us to take control of the user's screen and help them read off any text they desired. The final product was settled with a far more simple and restricted version of the design that can be seen above. Our final prototype still retains the basic functions of this design, which is having a human read out the desired text but it lacks all the settings and visual appearance we would have liked. Ideally, our final prototype would be very similar to the prototype with all the settings that can be seen, as those are all settings our client had requested. Without these settings, our clients' experience with our product may not be enjoyable compared to if they had these settings available to them.

All the prototype design files can be found on our Makerepo page seen here:
<https://makerepo.com/cinga/gng2101a1trialogue>

3 Conclusions and Recommendations for Future Work

Throughout the whole project, our group has learned a lot. However, most of our learning was done while creating our prototype. We initially tried to find an open-source screen reader's code we could change to suit our client's needs. We found the NVDA screen reader's code on Github but we were not able to modify their code due to our limited coding skills and knowledge. We then found we could use WebRTC and add real-time communication to a desktop application programmed with C#, and implement the screen sharing feature in our solution. Unfortunately, we faced an issue; we were unable to share our screen with other computers for still unknown reasons. Since time wasn't on our side we first decided to go with TeamViewer which is a customizable platform that allows companies to work remotely. However, to customize TeamViewer you must be subscribed to them which was an issue since we wanted our services to be very affordable. Finally, we decided to use chrome's remote desktop extension which is a way better solution since it is not only free but simple to set up and use. All of this is to show the multiple technologies we had to learn about. We initially had very basic level programming skills and little to no knowledge of how applications, especially screen readers, work. We were finally able to provide a solution to our client's needs even though it doesn't fully look like what we expected.

For future work, we expect to create a solution that starts up as soon as our clients log in to their computer and notify us at the same time since our solution is only active when our clients open their browser. We can also make our solution better for our clients if we find a way to make our services free.

4 Bibliography

[Getting started with WebRTC](#)

[nvaccess/nvda: NVDA, the free and open source Screen Reader for Microsoft Windows \(github.com\)](#)

[Integrating TeamViewer features into your applications](#)

[Create a Windows Forms app with C# - Visual Studio | Microsoft Docs](#)

APPENDICES

APPENDIX I:

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