

DrawTalk, an alternative input method for an AAC aid

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1. Overview

Drawing to communicate goes back to the cave man times. An Assistive Technology Professional suggested its use within an **Augmentative Alternative Communication aid (AAC)**. University course students implemented this in an alternative method of user input. The technological image recognition limitations did not allow useful evaluation.

2. Background

During a casual discussion between a Senior Lecturer and an Assistive Technology Professional (ATP). The ATP said, "Wouldn't it be good if an AAC user could draw a picture and the device spoke a phrase, that had been associated with it?"

This original concept was carefully and sensitively presented to a small group of students, enrolled in a module called "Group Project" at MSc level. The Senior Lecturer himself disabled explained some of the everyday physical difficulties an AAC user lives with and the added difficulty of having to use a device to communicate and different methods to access the devices, including multiple scanning methods, to direct selection with a finger [1]. The student's interest grew and they became intrigued by the situation and to what they could do to enhance these individual's lives.

Again it was pointed out to the students by the Lecturer that these scanning methods require the user to retain comprehensive sequences of selections. [1-2]. Thus requiring any users to be able to learn and then retain quite a significant cognitive loading; it was hoped users own images would reduce this learning load.

3. Methods

The student group had ten weeks contact time with the Lecturer, in order to research and develop the application. During this time the Lecturer would encourage the students to communicate with the ATP, whom could provide a comprehensive description of the user's limitations, while ensuring the users anonymity. The Lecturer, while asking them to investigate other applications and their input methods, would constantly remind them to think outside of the AAC domain and

use their experience to enhance their creation. One student within the group focussed on the application development, while the others reported to the group and discussed the functionality the application. The application was developed using xCode and OpenCV [5], which is an industry standard Graphics Library.

The iOS application went through a number of alliterations, before being first presented to the ATP and then to the ATP's Client.

3.1 The Final Prototype

The students created three innovations, which were mainly inspired by the major constraints of only being able to recognise vertical line/s, square/s and triangle/s. The three innovative developments are briefly explained here:

1. Dual Screen Interface
The screen is divided into two, when the same shape/s are drawn on either side they can be assigned a different phrase, or action. For example, a square may be assigned, "Yes" on the left side of the screen, but "No" on the right.
2. Secret Communication
For personal communication e.g., whilst visiting the Bank, Doctors etc., Protected Drawings were created and display the user's response (see Figure 1).
3. iBeacons
Bluetooth iBeacons each have a unique identification and are located in different rooms. Then the same symbol can be assigned different phrases depending on which device Identification is present. For example, a square in the kitchen could speak, "Please turn the cooker on". However, in the living room it may say, "Please turn on the television."

In addition, on the suggestion of the Lecturer, data logs of the user's activity are stored and can be emailed to the ATP for analysis [3], whilst the ATP is visiting the user.

4. Results

With all of the time used for the research and development of the application, the students did not get comprehensive feedback of the ATP's visit to the user. However, the ATP reported to the Lecturer the individual did not

seem to get on with the application, due to its limited image recognition.

5. Conclusion

Whilst this was a complete success for the students and Lecturer, with the students learning about alternative input methods and the idea of inclusion within software development, clearly the image recognition severely impacted on the user's ability to use the application. In addition, one user does not constitute a good user population. With the enhancements suggested below and a much larger population, more convincing results, could and should be obtained.

6. Future Enhancements

It was evident from the results that in order for this application to become an AAC worthy of consideration by an ATP it would need to be able to recognise more symbols than, (see Figures 2, 3 and 4) Line/s, Square/s and Triangle/s [4]. One particular symbolic language was brought to the Lecturer's attention called, Bliss [5]. DrawTalk and the symbolic language of Bliss and was proposed for investigation to a BSc student for his "Final Year Research Project". This investigation is now taking place using the computer technique of **Optical Character Recognition (OCR)** with the Bliss Symbols.

The results of these enhancements will be reviewed and reported in future publications.

7. References

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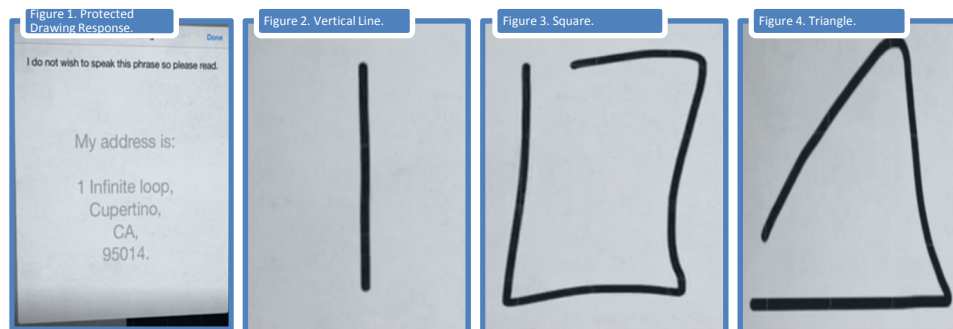


Figure 1 : Example user response/turn in communication dialogue

Figures 2-4 : Example user symbols

(Figures 1-4 left to right)