

ENGR 390

**Software Design Application - Sign Sound See
Scrum Report**

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ABSTRACT

This report discusses the ENGR 390 course project to designing a glove that translate sign language via an Android application. The report discusses our current User Stories in our Product Backlog and the tasks in our Sprint 1. It allows discusses how our goal for Sprint 1 is to create a simple version of the application that can receive a signal from the hardware and output the results in either a text or voice page. By the end of Sprint 1, we would like to have the functionality of our project to be working.

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1.0 INTRODUCTION

American Sign Language is a natural language and is the main sign language of the Deaf and impaired communities in the United States and most of Canada. English words are often borrowed through fingerspelling, which is the representation of the letters of a writing system using only the hands. This alphabet has often been used in deaf education, mainly that of young children. Figure 1 illustrates what is known as the American Manual Alphabet and illustrates the symbols that we will be following in the configuration of our project.

The purpose of this project is to design a glove that will be able to translate fingerspelling via an Android application with the goal of being used as a tool for deaf education and for the general public to understand sign language from a user.

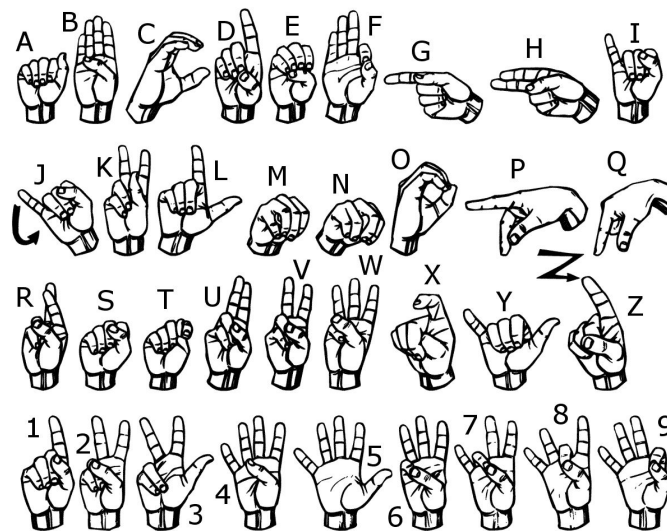


Figure 1: American Manual Alphabet [1]

1.1 Document Representation

This report discusses our current Product Backlog, including the user stories, and the tasks for our Sprint 1. Furthermore, it explains the goal for our upcoming sprint and what we expect to have completed at the end of the next two weeks. The following two sections explain the requirements of our project that should be covered in the Product Backlog and in the Sprints.

1.1 Glove requirements

Our requirements for the glove consist of having it recognize gestures and hand movements. The glove should also be able to calibrate itself for each user. The glove should have the ability to recognize the bending of each finger in relation to the other fingers in order to then associate the series of bent fingers to a standard American sign language letter. Finally, the glove should be able to transmit this information to the app.

1.2 Application requirements

The application should prompt the user to undergo a calibration setup for the glove. The app will store the calibration information for each individual user. The app will receive and store the letters transmitted by the glove. From there, the application should output the letters by displaying them as text and voicing them as sound. The app will include a tutorial section, which will act as a reference to teach the user the American Sign Language alphabet. Finally, the app will have a settings section that will enable the user to recalibrate the glove in the case where it was originally miscalibrated. The settings will also enable the user to choose an output preference (voice or text).

2.0 PRE-SCRUM #0

In this section, we will be discussing our current Product Backlog and the tasks in our Sprint 1. It is divided in two sections, respectively covering the two topics.

2.1 Product Backlog

Our Product Backlog currently contains User Stories that we've obtain and some functionality for our application that we would like to work on. Table 1 is an excerpt from our Product Backlog document.

Table 1: Current Product Backlog [2]

Story ID	Story Title	Card	Story Points(1-10)
UI-1	User Buttons	<i>As a user, I want to have two buttons so that when clicked one will get you to the sound translation section and the other will get you to the textable translation section of the sign language</i>	3
UI-2	Text variation	<i>As a user, I want to have the ability to see the text so that I can understand what the sign that i just did mean</i>	5
UI-3	Sound variation	<i>As a user, I want to have the ability to hear the sign done so that I can have the accessibility of learning while listening</i>	7
H-1	Glove Functionality	<i>As a user, I want to be able to use a glove that can read sign language gestures</i>	7
AA-1	Arduino to android	<i>As a developer, I want to have an immediate connection between arduino and android so that i can get information from the arduino to be placed in android</i>	9
I-1	Internal functionality	<i>As a user, I want to be able to go back from a specific page setup to the homepage of the application so that i can switch variation(sound or text)</i>	3

D-1	Database	<i>As a user, I want to have the letters saved in the database so that we can fetch for the letter called from the database</i>	9
UI-3	User Learning Functionality	<i>As a user, I want to have the letters shown so that when clicked on one will be directed to a video explaining how to do the letter clicked</i>	6
UI-4	User Format Control	<i>As a user, I want the action bar to contain a setting that switches between voice and text so that it will be an easy access</i>	5

In the table, we have six different type of Story IDs; UI relates to the user interface features, H relates to the hardware, AA represents the connection between the Arduino and the Android Application, I relates to the internal functionality of the App, and D represents a database story. Every user story currently in the Product Backlog (except UI-3) will be covered in our first Sprint. The following sections explain the result behind the choices for our first Sprint.

2.2 Sprint #1

Our goal for sprint 1 is to create the communication setup between arduino and the android application. Moreover, we will focus on creating the a simple version of the User Interface (UI). We will create buttons that will take us to different activities such that we have an activity that associated with receiving the translation in text format and on the voice translation for the american sign language. In addition to creating the buttons, we will setup and populate the database. The database will contain all information of the letters that are programmed using the arduino so that we may be able to find the proper letter received from the arduino's signal.

On the side of the hardware, we are sticking with the formats that are associated with the code for the sake of having the accurate functionality for our glove. To do so, we are putting the circuit together and assuring that the programming is giving us proper readings.

Using our goals for Sprint 1, we populated Table 2 with the task breakdown relating to the stories in the Product Backlog

Table 2: Sprint 1 Backlog [2]

Story ID	Task ID	Task Title	Task Description	Ideal Hours
UI-1	UI-1.1	Create 'Receiving Text' page	<i>Create a page where the received signal from the hardware will output a the respective alphabet text</i>	0.2
	UI-1.2	Create 'Receiving Voice' page	<i>Create a page where the received signal from the hardware will output the respective alphabet through a voice</i>	0.2
	UI-1.3	Create Button to go to Text Page	<i>Create a button in the main page called "Get Reading in Text"</i>	0.2
	UI-1.4	Create Button to go to Voice Page	Create a button in the main page called "Get Reading in Voice"	0.2
	UI-1.5	Link the buttons to their respective page	Connect the buttons to their respective pages. When the buttons are pressed, the program should go to the respective page	0.2
UI-2	UI-2.1	Fetch the received signal from the arduino in the app database	<i>Look up in the database for the value that's associated to the received value from the arduino</i>	1
	UI-1.2	Output the return value from the database	<i>Output the value returned from the database in an EditText</i>	0.5
UI-3	UI-3.1	Fetch the received signal from the arduino in the app database	<i>Look up in the database for the value that's associated to the received value from the arduino</i>	1
	UI-3.2	Output the return value from the database	<i>Output the value returned from the database as a Voice output</i>	1
H-1	H-1.1	Glove Creation	Attach the sensors on a glove so that the user can be able to perform sign language	1

	H-1.2	Arduino Program	Download the arduino program to the Bluetooth Arduino (BLUNO)	0.5
	H-1.3	Connect Glove with Arduino	Attach the sensors to the accelerometer and the accelerometer to the arduino in order to get the two components to function	1
	H-1.4	Test the Glove Functionality	Test the program to make sure that the reading of the sensors is giving a value	2
AA-1	AA-1.1	Connection between Android and Arduino	Import the arduino library in the android application. Use the necessary functions to link the application and the arduino together through a bluetooth signal	3
I-1	I-1.1	Back Button	Add the Up Navigation in the application so that the users can go back to home page	0.5
D-1	D-1.1	Database Creation	Create a database with one field being the values that will be received from the arduino and another field being the associated alphabet text	2
	D-1.2	Database Fetching	Create a function that will fetch the alphabet letter from the database according to a received input from the arduino	3

3.0 CONCLUSION

In conclusion, we populated our Product Backlog with User Stories relating to the requirements of our project. From there, we were able to come up with the task and goals for our sprint 1. By the end of the next 2 weeks, we should have at least an outcome of how our product is going to look and sound and we should have a functional product. In addition, we are also eager to see what we can improve in the hardware, if applicable, in the near future and also to progressively see if adding complete sentences/words will be an opportunity as well.

4. REFERENCES

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