



CALIFORNIA STATE SCIENCE FAIR 2017 PROJECT SUMMARY

Name(s) Elliott Kim	Project Number J0804
Project Title VibSpeech: A Communication Device for Both Visually and Aurally Impaired	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The main objective/goal for this project is to create a successful communication device for the aurally and visually impaired. This is being done to help the thousands upon thousands upon thousands of blind AND deaf people, otherwise known as the deaf-blind. The mini goals to achieve this large goal consists of creating a speech recognition program, speech to text program, text to morse code module, morse code to vibrations module, TCP/IP connection, OLED display control, etc.</p> <p>Methods/Materials Method/Materials: In order to achieve this project, many mini goals had to be completed. This section will be going over how these mini goals were completed. Speech to text and speech recognition was done by taking out parts of a speech recognition library called "SpeechKit". The others parts of code (listed in the objectives and goals) were all mostly created by the experimenter himself, however, there are a few more libraries assisting here and there. Some of the very important materials consisted of a Raspberry Pi, circuit parts, computer, soldering kit, and several program editors.</p> <p>Results Overall Device Results: The device results showed a very high success rate in translating speech to morse code. The only error in the overall device is when the speech recognition fails to tell the difference between words that sound similar (such as "two", or "too", or "to", etc.). In the first experiment, (this experiment is testing how well the speech to text worked) the results were on the less successful end (notebook has specific numbers). In the second experiment, (which is testing how well people decoded Morse code) the results were on the very low (notebook has specific numbers).</p> <p>Conclusions/Discussion Overall Device: As stated above, the overall success of the device is good and the only problems is with words that sound similar to once another. The reason for the low success rate in the first experiment is since many of the families the experimenter tested learned english as their second language, the speech to text and speech recognition program itself worked without many flaws. The results of the second experiment was expected to be low as well since the many families that were tested didn't know Morse code, but had the assistance of a Morse code table. Again, these repeated trials shows that the programing itself barely makes any flaws however, the errors in the results is due to human error.</p>	
Summary Statement A communication device for the aurally and visually disable that uses a tactile sense based communication system.	
Help Received Some of the people that helped me consisted of Elaine Gillum (gave me tips/advice), and the people that were test using the experimenter's program that he built	