

Fig 2 shows the menu window of our application. It can be seen that there are three options i.e. Help (virtual Talk), Mail and SMS along with Exit button, these options are made to toggle using LabVIEW. If the patient wants to choose an option and his eye blink matches with the preferred option toggle, then that option is selected. Once the option is chosen, the corresponding front panel of that option will be opened. Suppose, the patient wants to quit the application, he needs to select Exit button by blinking correspondingly. In the Virtual talk module, a window is created using a set of 10 predefined commands that include basic necessities such as need for food, water, general help, usage of toilet, switching off of lights, get off wheelchair, change of diaper, change of position, play music, good morning and good night. These commands are placed alongside LEDs that is each set to blink in series after a time period of say 5seconds. When the patient requires a certain command; he provides a trigger when the LED glows for that respective command. This also enables a voice alert system. The Alphabet panel consists of all the 26 alphabets along with special characters such as 'space' and 'return'. Using the same logic as the previous panel, the LEDs blink in series for each alphabet and this can be used to create a string of words. On selecting return, the word is displayed in a separate display box. The below figure shows the email window of our application. From the figure, it can be noticed that two options are provided – Confirm and Cancel.

Confirm button is used to send the mail and cancel is to discard the mail. Recipient address and message is shown for the user to verify that the mail is correct and can be sent. Typing message is same like typing mail. Once the message is created, DONE button is used to send the message. Sending the message is accomplished using Mobile module in LabVIEW. DONE button is selected to bring the control to the main menu for module selection. After using the application, EXIT button in main menu is used to quit the LabVIEW

**Results and Discussion:** The above experiment was conducted for 4 subjects whose age is in the range of 19-22 years. The experiment is done in an environment surrounded by various instruments to determine the system's stability. The amplitude of normal EEG signal and EEG signal with eye blink and frequency of eye blink obtained from the 4 subjects is tabulated as shown in table 1. From the table, it can be noticed that average amplitude of the eye blink is around 3.45 V. The EEG of one subject along with FFT is shown in the Figure 5. From the figure, it can be depicted that the amplitude of the EEG signal after 2 stages of amplification is ~3.6 V. Also, it can be

noticed that 50Hz power line interference is suppressed completely with the help of the Active twin-T notch filter. The maximum peak obtained in the FFT is near 6.25 Hz, indicating that the maximum power of the patient's EEG lies in the region of delta whose frequency is of 4-8 Hz

Table 1: Amplitude and frequency of subjects EEG

Subject	Amplitude of EEG (V)	Amplitude of EEG with Eye blink (V)	Frequency of Eye Blink (Hz)
Subject 1	3.40	5.8	4.63
Subject 2	3.00	6.6	3.37
Subject 3	2.60	6.4	3.25
Subject 4	2.24	6.1	5.28
Subject 5	2.82	6.2	4.13
Subject 6	2.74	6.2	4.26
Subject 7	2.50	6.3	3.75
Subject 8	3.20	6.5	4.20
Subject 9	2.90	6.0	4.45
Subject 10	3.10	6.4	4.90

**Conclusion:** The communication system has three modules and thus provides more comfortable and less frustrating method of access to the subject as they can convey their thoughts faster. Also few pulses are required from the subject for us age of the system. This system is highly suitable for those who are bedridden and require communication of their needs to others for helping them do their day today basic needs. The additional sound files that are installed acts as an added advantages it can allow people to quickly and effectively understand what the subject is trying to convey. The alphabet boards allow the patient to converse his thoughts with more specificity. From the results we had got we could very well say that our protocol will be a very great breakthrough in the field of assist device and the patients would love and enjoy sending mail and SMS. The success rate of our system is around 90% in adults and 65% in elder people. From our experiments, we found that there is a delay of 2 seconds in time between the blink and the activation of the particular action..

**Appendix:** Appendixes, if needed, appear before the acknowledgment.

**Acknowledgment:** The preferred spelling of the word "acknowledgment" in American English is without an "e" after the "g." Use the singular heading even if you have many acknowledgments. Avoid expressions such as "One of us (S.B.A.) would like to thank ... ." Instead, write "F. A. Author thanks ... ." Sponsor and financial support acknowledgments are placed in the unnumbered footnote on the first page.

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