

PROJECT COEUS

Using Brain-Computer Interfaces (BCIs) to increase patients' ability to effectively communicate



CHALLENGE

Approximately 5,000 people in the U.S. are diagnosed with ALS each year, often losing the ability to speak. This is one of many diseases that inhibit communication.



SOLUTION

We propose an app that displays letters and predicted words on a radial structure and uses a Brain-Computer Interface (BCI) to convert the user's brainwaves to text.



IMPACT

By implementing this solution we can increase the rate of communication for patients by 300% - 500%.

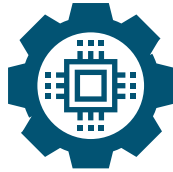
How Does the BCI Function?



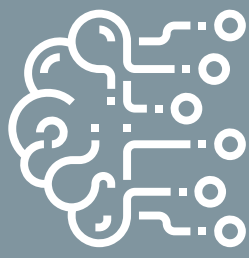
Uses special events to recognize what character / word is being looked at. This is through raw EEG data collected by a BCI.



These special events are called P300 events, which are attributed to specific stimuli of the brain from the colour and frequency of the flashing light.



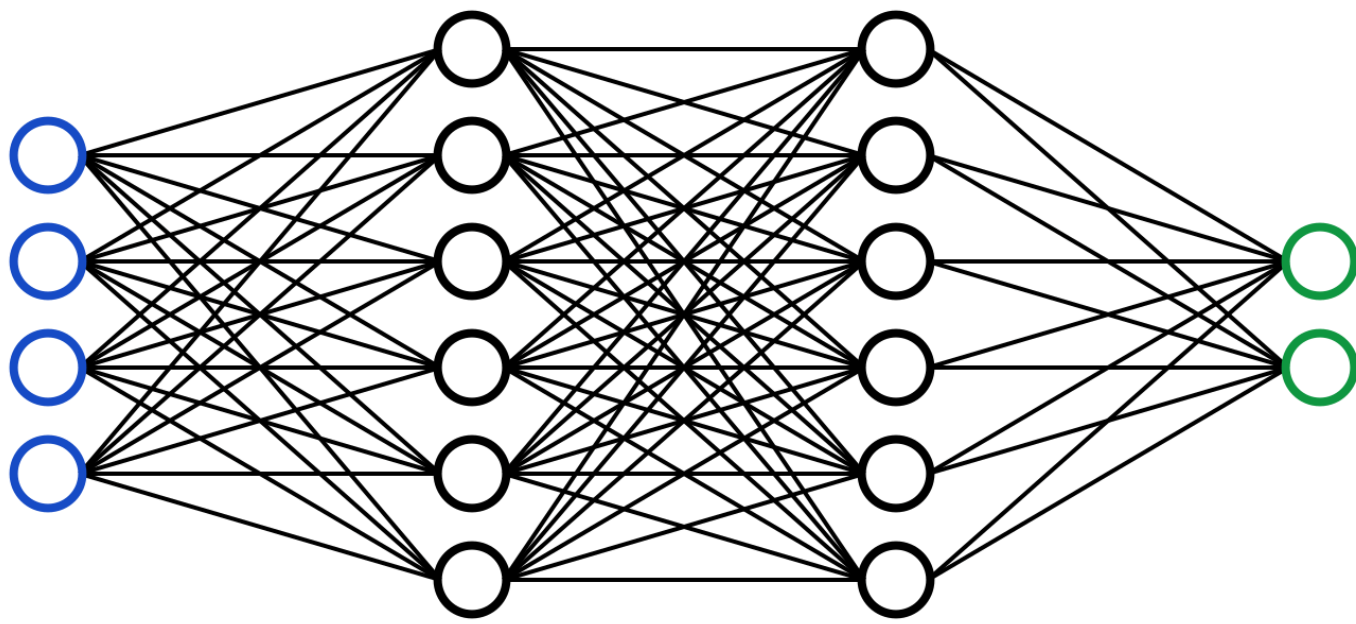
Using a radial design, with each character being a different colour and frequency, a BCI can output raw brainwave data that the AI can recognize.



Usage Of Project Coeus

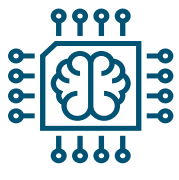
The EEG cap collects the users brainwaves and passes them to another device where they are separated. The distinct alpha, beta, gamma and delta waves are given to a Recurrent Neural Network that predicts the color and frequency of the light stimulation.

AI Elements



Predictive RNN

By using a recurrent neural network to predict the frequency and color of the light being looked at our model is able to accurately determine which node the user is focusing on.



Categorical NLP

Using a categorical NLP model, we can accurately predict what words the user might be in the process of typing and display a node containing the most likely words.



Results

With our new innovative BCI x AI typing, we can achieve an optimal result of 50 wpm and an average of 35 wpm. This will allow the radical transformation of the lives of thousands of people, allowing them to speak at average typing speeds, giving them the ability to communicate with everyone around them.