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Wireless Brain Implant

Ganesh Babu P¹, Kirubakaran T²

¹Assistant Professor, Department of Biomedical Engineering, Adhiyamaan College of Engineering (Autonomous), Dr. M. G. R. Nagar, Hosur, Tamil Nadu, India

²Student, Department of Biomedical Engineering, Adhiyamaan College of Engineering (Autonomous), Dr. M. G. R. Nagar, Hosur, Tamil Nadu, India

ABSTRACT

The wireless brain implant project aims at developing and embedding into the head, a three-dimensional intracortical electrode array with all electronics required for signal acquisition, processing, and wireless communication.

Keywords : Brain-machine interfaces, Brain Implant

I. INTRODUCTION

People with locked-in syndrome, a condition where a healthy mind is unable to express itself due to brain damage, are slowly being opened up through direct contact with their motor neurons in the brain.The electrodes were designed to measure activity in the speech centers of the brain through implanted electrodes. These electrodes can then relay the information to a sub-dermal amplifier and then to a computer via wireless FM transmission. Through this system a patient has demonstrated the ability to form rudimentary vowel sounds on a synthesizer using just his thoughts.

II. II.SPEECH MECHANISM

Electrodes on the brain have been used to translate brainwaves into words spoken by a computer – which could be useful in the future to help people who have lost the ability to speak. When you speak, your brain sends signals from the motor cortex to the muscles in your jaw, lips and larynx to coordinate their movement and produce a sound.

III. BRAIN MACHINE INTERFACE (BMI)

Brain-machine interfaces (BMIs), aka brain-computer interfaces (BCIs), are in development by several different teams across the globe. The project uses similar wireless transmission technology to connect electrodes in the brain to cursors on a computer, or even the controls of an electric wheelchair. This project uses motor neurons to control movement. The Speech Lab/Neural Signals BMI is somewhat rarer because it is translating those signals which might inform mouth/tongue/vocal chord movement and directly interpreting them as sounds. This layer of interpretation is difficult to perfect but its pursuit gives us hope that one day we could see devices that actually "read" our thoughts and translate them into images, sounds, and other sensations. Once we achieved that level of "mind-reading", there could be a direct conduit between our mental and digital worlds. Totally immersive virtual reality, surrogate bodies...the possibilities really expand at that point.

IV. WORKING



Implanted electrodes in the speech center of the brain can communicate wirelessy via FM transmission with a computer. This allows a computer to inteprete brain activity into sounds using a speech synthesizer.

For now, research into turning thoughts into sounds is still at a rudimentary level. Neural Signal designed the hardware (electrodes, amp, receiver) and implanted it, but the Speech Lab had to develop the software routines to interpret the information into sounds. A synthesized voice produced on a computer gave the patient auditory feedback so that he could hear how his "thoughts" were being translated and could focus on correcting them as needed. That feedback was remarkably fast, about 50ms, on par with the normal speed of talking. After practice, the patient's ability to listen to vowel sounds and then repeat them improved from 45% to 70% (and beyond).

V. CONCLUSION

A short overview of wireless brain implant has been provided. This System of whole is implanted within the brain to facilitate the patients. This system also provides a connection between human brain signals and digital signals. The other fabrication techniques are required for the improvement of the system.

VI. REFERENCES

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