

# Neuroengineering, Brain-Machine Interface, and Artificial Intelligence as the Future of Treating Neurological Disorders and Diseases

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## **Abstract:**

Neuroengineering, as an area of study, includes fundamental aspects of those studied in neurosciences. With a focus on the brain, neuroscience wants to “define who we are and what we do ” which includes our memory, our brain circuitry, thoughts, and physical actions. More recently, neuroscience has become interdisciplinary to include the sciences of math, computer science, engineering, and the medical field among others; AI can be argued to have its origins and roots in neurosciences. A particular focus on brain-machine interface, programmed with artificial intelligence, can be technologies that benefit those who suffer from neurological disorders and diseases. The Brain-machine interface, as a point of departure, is where artificial intelligence is located within various neurotechnologies, such as neuroprosthetics, that can be used in medical procedures to treat the symptoms of diverse neurological disorders and diseases. Brain activity interference based on neurotechnology can be very effective, allowing for the successful treatment of brain disorders. In particular, this research will examine the role and function of neuroprosthetics as they are applied in treating diseases such as Parkinson’s, Amyotrophic lateral sclerosis, Epilepsy, Tourette’s Syndrome, and major depressive disorder. The ethical issues that revolve around these technologies will also be explored in order to better understand and research them in the future.

**Keywords:** Brain-Machine Interfaces, Epilepsy, Parkinson’s, Amyotrophic lateral sclerosis, Tourette’s Syndrome, Major Depressive Disorder, Artificial Intelligence, Neuroengineering, Neuroprosthetics

**What will the audience learn from the presentation:**

1. Brain-Machine Interfaces and their role in neuroprosthetics
2. Treatment of neurological disorders using BMI's and artificial intelligence.
3. Epilepsy, ALS, Parkinson's, Tourette Syndrome, and Major Depressive Disorder
4. Ethics in neurotechnologies

**Biography of presenting author:**

Begüm Bulgurluoğlu was born in 2005 in Istanbul, Turkey. She will graduate from Hisar High School in 2023.

**Publications:**

B. Bulgurluoğlu, "Effects of Childhood Abuse On Adulthood", Columbia University Book: Steam Punks, 2021, pp 253.

B. Bulgurluoğlu, "Dear Diary" Columbia University Book: Origin Stories, 2020, pp 99.

B. Bulgurluoğlu "Impacts of Sleep On Memory and Learning", Hisar Science Newsletter, 2021, pp 8.

B. Bulgurluoğlu "Benefits of Artificial Intelligence in Medicine", Hisar Science Newsletter, 2021, pp 13.

B. Bulgurluoğlu "Somatoform Disorders: Psychological Illness Reflecting On Physical Health", Nexus Magazine, 2022, pp 75.

B. Bulgurluoğlu "Shopping and working with AI- a psychological perspective", 5th Edition of International Conference on NEUROLOGY AND NEUROLOGICAL DISORDERS Abstract Book, 2022, pp 53.

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