# California Institute of Technology Researchers Develop Device to Decode Internal Speech with 79% Accuracy



Researchers at the California Institute of Technology have advanced brain-machine interface (BMI) technology by developing a device capable of decoding internal speech from brain activity with an accuracy rate of up to 79%. This breakthrough, detailed in the journal Nature Human Behavior, involved implanting microelectrode arrays in the supramarginal gyrus of the brains of two participants, which then captured and translated their internal monologues into words.

During trials, the participants thought of specific words internally following a prompt, and the device, through real-time decoding, demonstrated significant adeptness in recognizing these inner thoughts. It managed to decode various internal speech processes, like silently reading or visualizing the depicted object of the word, in two different participants with contrasting levels of decoding accuracy.

This technology mirrors principles used in other BMIs such as Elon Musk's Neuralink, which translates brain signals into motor controls for interacting with machines. Unlike this device, Neuralink faced complications during human trials, including a serious health incident with its first patient post-implantation, which nearly halted the trial.

The research suggests the potential for BMIs to facilitate communication for individuals unable to produce vocal speech due to injury or disease. Further research will focus on refining the technology by increasing participant numbers, introducing more vocabulary, and improving the learning model with minimal daily training data.