

Chen Institute Symposium 2025

Speaker: Jaimie Henderson

Talk title: *Recent Advances in Intracortical Brain-Computer Interfaces*

Abstract: Intracortical brain-computer interfaces (iBCIs) have shown promise in restoring function to people with neurological diseases and injuries. Recent demonstrations include control of computer cursors and robotic limbs, as well as high-performance decoding of complex movements such as handwriting and speech. This lecture will discuss recent advances in iBCIs, focusing on restoration of communication and motor function for people with paralysis, as well as exploring their role in reshaping our understanding of the motor cortex. Contrary to the conventional homuncular model, recent findings suggest a nuanced organization within the precentral gyrus, with intermixed representations of upper and lower extremity movements as well as syllables, words and movement sequences. Discussion will focus on how scientific and engineering insights can help guide continued progress in understanding brain function and designing high performance assistive devices for restoration of neurological function.