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Edition IV

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New challenges and opportunities in implantable electrode arrays

Abstract: The future story of minimally invasive implantable neuro electronics has yet to be written. The application demands advanced manufacturing, miniaturized electronics, and a revolutionary approach to packaging. As challenging as those problems are, even more difficult is defining the best electrode and substrate geometry to optimally record from multiple brain regions. This talk will focus on the process of choosing the electrode/substrate geometry, trajectory, and target with input from lead field theory and biophysical models. These efforts have driven us toward novel depth arrays in the applications of BCI and seizure localization but apply to any electrode recording or stimulation application. Finally, we will share our progress in manufacturing to achieve our goal of large-scale depth arrays.

Brief Bio: *Professor Seymour's research is in the area of advanced neurotechnology with a focus on translational brain-machine interfaces. His research has addressed topics including reduced tissue reactivity and improved optical, electrical, and mechanical characteristics of bioelectronics devices. He is an Associate Professor in the Department of Neurosurgery at the McGovern Medical School at the University of Texas Health Science Center at Houston. He also holds an appointment as Adjunct Assistant Professor in ECE at Rice University. He was recently awarded the University of Texas Rising Stars Award. He earned his B.S. with Honors in Engineering Physics from Ohio State University and his M.S. and Ph.D. in Biomedical Engineering from the University of Michigan. His industry experience includes working at NeuroNexus as a Principal Scientist. Dr. Seymour's other academic experience includes serving as research faculty in the Department of Electrical Engineering at the University of Michigan where he developed novel neural interface systems including neuroscience mapping tools.*