The brain is a complex system comprised of billions of neurons that work coherently together to control our behavior and general function. The advent of techniques such as multi-electrode recordings, microstimulation and neural imaging has provided powerful tools for modern systems neuroscience to study learning and neural adaptation, and importantly how neural function is compromised in the diseased state. In this talk, I will focus on electrical microstimulation, and how it can be used both as a tool to study brain states and a therapeutic mechanism to treat circuit-wide disorders. The first part of the talk will focus on applications of microstimulation in animal models. In this half, I will demonstrate through modulation of neural signals encoding value using microstimulation in the dorsomedial striatum that I can differentially modulate decision-making processes, which are often compromised in the disease state. I will also present results showing that closed-loop microstimulation of prefrontal areas has anxiolytic effects and modulates autonomic state. In the second part of the talk, I will focus on materials and devices for neurotherapies. When microstimulation is applied, it is advantageous to be able to probe the system and record neural activity simultaneously during stimulation. I will present work on carbon nanotube fiber microelectrodes and discuss how this novel material provides an excellent bidirectional interface with neural tissue. This will be followed with a discussion of a new device for wireless neuromodulation and recording, which utilizes a state-of-the-art ASIC for fast charge-clearing and near-perfect stimulation artifact removal. I will conclude this talk with my future directions in the development of neuroprosthetic devices and new modalities beyond microstimulation.