

Cover Page

Title:

Modeling the latent structure of coma and consciousness

Team:

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Project Summary:

Return of consciousness following TBI is gradual and uncertain and treatment for restoring consciousness is limited due to a lack of knowledge regarding the underlying mechanisms that support consciousness. At Stony Brook, we have put together an interdisciplinary team of a system/computational neuroscientist (Dr. Mofakham), a neurosurgeon (Dr. Mikell), neuroimaging expert (Dr. Huang), and an electrical engineer with expertise in machine learning (Dr. Djurić) to investigate and reveal the underlying mechanisms that support consciousness. This proposal leverages advanced capabilities in neuroimaging, stereotactic and functional neurosurgery to directly target and record the electrophysiological activity in depth cortical regions as well as using single-pulses of stimulation to interrogate the brain as it recovers from coma. To the best of our knowledge we are the only group that has access to this human database. The long-term goal of these efforts is to devise novel therapeutic approaches to alter pathological brain states and restore consciousness in comatose patients. Thus, knowing the underlying circuitry supporting consciousness is critical.