RESEARCH FOCUS

The research focus of the Autumn’s Dawn NICE lab is to develop models of brain networks involved in cognitive and perceptual processes, and to determine how those models evolve and differ in normal, impaired, and diseased brain states.

RECENT DEVELOPMENTS

- Application of dynamic causal modeling (DCM) and Granger causality models to describe the connectivity states of spatial reasoning in math gifted and normal children.
- Investigation of attentional networks in children and young adults with autism using functional magnetic resonance imaging (fMRI) and EEG.
- Use of fMRI to investigate and identify the brain activity and cognitive processes found in college students who binge drink as compared to those who are moderate drinkers.
- Identification of the EEG features associated with mild cognitive impairment patients who are (or are not) most likely to progress to Alzheimer’s disease.
- Investigation of the neural correlates associated with different learning styles in engineering students.
- Development of sequential forward floating techniques (SFFS) to improve classification accuracy when applying pattern recognition to classes with heterogeneous characteristics – for example, cognitive disorders that present with a variety of different symptomologies, like Alzheimer’s Disease and autism.
SAMPLE PUBLICATIONS


MAJOR RESEARCH GRANTS

Autumn’s Dawn Foundation, Gift for Neuroimaging Research on Autism, $500,000

FACILITIES

32 channel Neuroscan Synamps RT/EEG system with STIM presentation software and 64 channel EGI system with ePRIME for electroencephalographic investigation of brain wave activity.

Motion Capture video, treadmill, and gait analysis

Structural and Functional MRI and Diffusion Tensor Imaging (DTI) capabilities via new Siemens’s Skyra 3T system in collaboration with the Texas Tech Neuroimaging Institute (TTNI)

RESEARCH TEAM

Dr. Mary C. Baker, Electrical and Computer Engineering

Dr. Michael O’Boyle, Human Development and Family Studies

Dr. David Richman, Burkhart Center for Autism