Biomedical Engineering: Ph.D. Dissertation Topics

2016 Dissertation Titles

- Mobility Feedback for the Visually Impaired
- Miniature Linear Phased Array for Colorectal Robotic Surgery & Forward-looking Intravascular Imaging Catheter
- Spectral-domain Optical Coherence Microscopy for Label-free Imaging in Developmental Biology
- Understanding Music Perception with Cochlear Implants with a Little Help From My Friends, Speech and Hearing Aids
- High Frequency Ultrasound Array for Ultrasound-Guided Breast Biopsy
- Knowledge-driven Decision Support for Assessing Radiation Therapy Dose Constraints
- Nonlinear Dynamic Modeling of Biomedical Systems with Laguerre-Volterra Network
- Principal Dynamic Mode Analysis of Cerebral Hemodynamics for Diagnosis of Cerebrovascular and Neurodegenerative Disease
- Demographic and clinical covariates of sensorimotor processing
- Configurable Imaging Platform for Super-Harmonic Contrast-Enhanced Ultrasound Imaging
- Computer Vision Aided Object Localization for the Visually Impaired
- Oxygen Therapy for the Treatment of Retinal Ischemia
- In Vitro Examinations of Retinal Stimulation
- Investigation of the Electrode-Tissue Interface of Retinal Prostheses
- Development of Microfabricated Polymer Technologies for Implant Applications

2015 Dissertation Titles

- Electrochemical Evaluation of Parylene-based Electrodes for Neural Applications
- A Probabilistic Mode Predicting Retinal Ganglion Cell Responses to Natural Images
- Neural Spiketrain Decoder Formulation and Performance Analysis
- Development of Implantable Parylene-based Mems Technologies for Cortical Applications
- Strategies for Improving Mechanical and Biochemical Interfaces Between Medical Implants and Tissue
- Multi-modality Intravascular Imaging in Combined Use of Ultrasonic and Optical Techniques
- Electronics Design and In Vivo Evaluation of a Wirelessly Rechargeable Fetal Micropacemaker
- Task-dependent Modulation of Corticomuscular Coherence During Dexterous Manipulation
- Wireless Electrochemical Drug Delivery Micropump with Fully Integrated Electrochemical Dose Tracking Feedback System
- Understanding the Pathology of Dystonia by Hardware Emulation
- Modeling of Neonatal Hemodynamics During PDA Closure
- Ribavirin Systemic and Intracellular Exposure and Its Role on Viral Response and Anemia in Chronic Hepatitis C Genotype 1 Infection
Biomedical Engineering: Ph.D. Dissertation Topics

- Faster & Quieter: Real-time MRI Methods for the Evaluation of Sleep Apnea
- Control and Dynamics During Two Turning Tasks with Different Rotation and Translation Requirements
- Systems Pharmacology for Acute Myeloid Leukemia and Feedback Control Pharmacodynamic Models
- Mechanical Design and Testing of a Percutaneously Implantable Fetal Pacemaker

2014 Dissertation Titles

- Regional Cerebral Hemodynamic Responses to Hypoxia in Humans using MRI and NIRS
- Modeling Autonomic Peripheral Vascular Control
- High-Frequency Ultrasonic Transducers for Photoacoustic Applications
- Understanding the Degenerate Retina's Response to Electrical Stimulation: an in Vitro Approach
- Strategies to Improve Stimulation Efficiency and Temporal Resolution of Epiretinal Prosthesis
- Towards a Large-scale, Biologically Realistic Model of Hippocampus: System Architecture and Simulation Studies
- High Frequency Ultrasonic Array Imaging System and Its Applications
- Contrast Enhancement Using Dual Apodization with Cross-correlation in Ultrasound Imaging
- Pattern Detection in Medical Imaging: Pathology Specific Imaging Contrast, Features, and Statistical Models
- Modeling and Analysis of Diffusion in the Human Brain
- FLT3 and CDK4/6 inhibitors: Signaling Mechanisms and Tumor Burden in Xenograft and Orthotopic Mouse Models of AML