Program Themes

Theme 1. Biomedical Signal Processing

Theme 2. Biomedical Imaging & Image Processing

Theme 3. Bioinstrumentation, Biosensors, and Bio-micro/nano Technologies

Theme 4. Bioinformatics, Computational Biology & Systems Biology

Theme 5. Cardiovascular & Respiratory Systems Engineering

Theme 6. Neural & Rehabilitation Engineering

Theme 7. Cellular & Tissue Engineering, & Biomaterials

Theme 8. Bio-Robotics & Biomechanics

Theme 9. Therapeutic & Diagnostics Systems, & Medical Device Design

Theme 10. Healthcare Information Systems & Telemedicine

Theme 11. Technology Commercialization, Industry, Education and Society

Theme 12. Recent Advancement in Biomedical Engineering

Program Tracks

Track 1.1 Time-Frequency and Time-Scale Analysis

Track 1.2 Signal Processing and Physiological System Modeling

Track 1.3 Nonlinear Dynamic Analysis of Biomedical Signals

Track 1.4 Signal Pattern Classification

Track 1.5 Principal Component Analysis and Independent Component Analysis

Track 1.6 Adaptive and Parametric Filtering

Track 1.7 Neural Networks and Support Vector Machine Applied to Biomedical Signal Processing and Classification

Track 1.8 Coupling and Synchronizations

Track 1.9 Algorithms for Data Mining and Data Processing

Track 2.1 Magnetic Resonance Imaging

Track 2.2 Ultrasound Imaging

Track 2.3 Optical Imaging, Microscopy, and Infrared Imaging

Track 2.4 X-ray, CT, PET, and SPECT

Track 2.5 Electrical Source, Impedance, Elasticity Imaging, and Other Modalities

Track 2.6 Image Recostruction and Retrieval

Track 2.7 Image Processing (Filtering, Enhancement, Segmentation, Registration, Classification, Compression, and Coding)

Track 2.8 Image Visualization and Volume Rendering

Track 2.9 Functional Imaging

Track 2.10 Molecular Imaging

Track 3.1 Acoustic, Mechanical, and Thermal Sensors

Track 3.2 Optical Sensors

Track 3.3 Bioelectric Sensors

Track 3.4 Biological and Chemical Sensors

Track 3.5 Wireless Sensors and Telemetry

Track 3.6 Nano- and Micro-Sensors

Track 3.7 BioMEMS

Track 3.8 BioNano Technology

Track 3.9 Microfluidics

Track 3.10 Magnetic Sensors

Track 4.1 Structural Bioinformatics and Computational Proteomics

Track 4.2 Bioinformatics Algorithms for Genomics, Proteomics, Metabolomics, and Lipidomics

Track 4.3 Computational Physiology and the Physiome Project

Track 4.4 Advances in Theory and Clinical Applications of Biological Network Studies

Track 4.5 Current Progress in Modeling Regulatory, Metabolic, and Proteomic Networks

Track 4.6 Biological and Medical Data Management, Ontology, Mining, and Visualization

Track 4.7 Emerging Topics in Computational Bioinformatics and Systems Biology

Track 5.1 Cardiovascular Pulmonary Mechanics (Ventricular, Vascular, CFD)

Track 5.2 Artificial Hearts and Ventricular Assist Devices (VAS, TAH, IABP, PCPS)

Track 5.3 Cardiac Electrophysiology (Mapping, CRT, ICD, Ablation, Arrhythmias)

Track 5.4 Cardiovascular Pulmonary Regulation (Neurohumoral, HRV)

Track 5.5 Cardiovascular Pulmonary Imaging (Echo, CT, MR, CARTO, EnSite, Endoscope, Odyssey)

Track 5.6 Cardiovascular Pulmonary Modeling (Computational)

Track 5.7 Cardiopulmonary Resuscitation (in the ICU and EMT Settings)

Track 5.8 Cardiovascular Signal Processing (ECG, BP, CO, Telemedicine, Smart House, Monitoring)

Track 5.9 Heart-Brain Connections

Track 5.10 Sleep Disorders and Respiratory Engineering (CSAS, OSAS etc)

Track 6.1 Neural Modeling and Computing

Track 6.2 Neural Microsystems

Track 6.3 Neural Prostheses

Track 6.4 Brain Machine Interface

Track 6.5 Neural Informatics and Signal Processing

Track 6.6 Neural Sensing

Track 6.7 Deep Brain Stimulation

Track 6.8 Sensorimotor & Neuromuscular Systems

Track 6.9 Neural Trauma

Track 6.10 Virtual Reality and Robotics in Rehabilitation

Track 6.11 Rehabilitation of Neural Function

Track 6.12 Neurophysiology and Clinical Applications

Track 7.1 Tissue Engineering

Track 7.2 Molecular and Cellular Bioengineering

Track 7.3 Biomaterials

Track 7.4 Biomaterial-Cell Interactions

Track 7.5 Drug Delivery

Track 7.6 Cellular Force Transduction

Track 7.7 Electrical Fields at the Cell and Protein Scale

Track 7.8 Cellular Therapies and Regenerative Medicine

Track 7.9 Hybrid Organic Synthetic Biomaterials for Sensing and Actuation

Track 8.1 Robotics for Therapy, Assistance and Clinical Evaluation

Track 8.2 Biomimetics

Track 8.3 Surgical Robotics

Track 8.4 Human-Robot Interaction

Track 8.5 Robotic Prostheses, Orthoses and Wearable Robotic Systems

Track 8.6 Computer Assisted Surgery

Track 8.7 Cell Mechanics

Track 8.8 Multiscale Biomechanics

Track 8.9 Orthopaedic and Musculoskeletal Biomechanics

Track 9.1 Internally Applied Therapeutic Devices

Track 9.2 Externally Applied Therapeutic Devices

Track 9.3 Image-guided Therapies

Track 9.4 Diagnostic Devices and Instrumentation

Track 9.5 Human Factors and Medical Device Design

Track 9.6 Safety and Medical Device Design

Track 9.7 Medical Device Design Process

Track 10.1 Personal Health Systems, Body Sensor Networks

Track 10.2 eHealth, mHealth, Telemedicine Systems

Track 10.3 Enterprise-Wide Image Management, Multi-Vendor PACS and Teleradiology

Track 10.4 Ambient assisted living, smart homes for the elderly with chronic diseases

Track 10.5 Data Mining, Knowledge Discovery, Personalized Decision Support

Track 10.6 Wireless Biomedical and Health Technologies

Track 10.7 Health Information Networks, Architectures, Interoperability, Electronic Health Records

Track 10.8 RFID, NFC in Health

Track 10.9 Emerging IT for Efficient/Low-Cost Healthcare Delivery

Track 11.1 Technology Commercialization

Track 11.2 Biomedical Engineering Education

Track 11.3 Career Development in Biomedical Engineering

Track 11.4 History of Biomedical Engineering

Track 12.1 Therapeutic Ultrasound

Track 12.2 Novel Imaging Technologies: Ultrahigh Resolution, Ultrahigh Speed

Track 12.3 Translational Molecular and BioPhotonics Imaging

Track 12.4 Ultra-sensitive Biosensing Technologies