

# Texas Institute of Science

## Research Areas

**TxIS**

012508

### COMMUNICATIONS TECHNOLOGY

- Distributed Real-Time Measurement & Computing Systems
- Inertial Navigation Systems
- Infrared & Barcode
- Mesh & Other Distributed / Dynamic Networks
- Microstrip Resonators & Antennas
- Multichannel Signal Processing Algorithms
- Radar & Microwave
- RFID Technologies
- Robust Array Signal Processing Methods
- Scale-Space Methods
- Sensor Fusion
- Sensor Networks
- Smart Antenna
- Smart Sensing
- Sonar Design Technology
- Ultra-Wideband (UWB) systems
- Underwater Acoustics

### GEOPHYSICS & EXPLORATION

- Adaptive & Non-Linear Signal Processing
- Geophysical Drilling Technology & Methods
- Hazardous Waste Management & Storage
- Magnetic Resonance Imaging
- Multicomponent Seismic Acquisition & Processing
- Petroleum & Gas Extraction Methods
- Petrophysical Image Analysis
- Seismic & Acoustic Methods in Porous Media
- Seismic Depth Imaging
- Seismic Exploration & Analysis
- Sensor Array Processing
- Time Lapse (4D) Seismic Acquisition & Processing
- Vertical Cable Seismic

### SIGNAL PROCESSING

- Analog & Mixed Signal Circuits & Systems
- Computational Electromagnetics
- Computer Vision & Pattern Recognition Algorithms
- Cryptographic Algorithms & Methods
- Current Density Imaging
- Digital Signal Processing Algorithms & Methods
- Multi-frequency Test Signals for Dynamic Analysis
- Pattern Recognition & Neural Networks
- Signal Laser Technologies & Applications
- Signal Processing of Physiological & Biomedical Signals

### MATHEMATICS

- Applied Probability & Stochastic Methods
- Chaos Theory
- Combinatorial Optimization
- Fractional Fourier Transform & Its Applications
- Fuzzy Modeling Classification
- Genetic Algorithms
- Graph Theory & Algorithms
- Mathematic Algorithms & Analysis
- Mathematical Models & Analysis
- Mathematical Statistics
- Petri Nets Theory
- Queuing Systems Analysis
- Stochastic Methods

### MECHANICAL & MATERIAL SCIENCES

- Mechanical Preparation & Processes Modeling
- Adaptive & Advanced Control Algorithms & Systems
- Alloy Composition, Development, & Analysis
- Composite Composition, Development & Analysis
- Corrosion Modeling, Analysis & Prevention
- Elasticity & Elastomechanics
- Electromechanical Machines & Control
- Energy Storage (Lithium Batteries, Fuel Cells, etc.)
- Fluid Mechanics & Dynamics
- Heat & Mass Transfer
- Laser & Plasma Irradiation Processes
- Material Coatings & Bonding Technologies
- Material Science of Magnetic Materials
- Mechanical Structures / Systems Modeling & Analysis
- Mechanical Tribology
- Physics of Strength & Plasticity
- Process & Power Control Systems
- Solid-state Physics
- Superconducting Materials & Circuits
- Surface Treatments Using Laser, Plasma & Ion Technologies
- Thermal Processing of Materials
- Thick Film & Thin Film Manufacturing Technology
- Torque & Other Mechanical or Micromachined Sensors
- Wear and Fatigue Modeling, Analysis & Correction

### NANOTECHNOLOGY

- Bio-Nanomaterials, Characterization, Modeling
- Design of Molecular Structures
- Material Science of Nanotechnology & Nanostructures
- Micro-Electro-Mechanical Systems
- Nano Tools
- Nanocrystalline Materials
- Nanomaterials
- Nano-sensors
- Nanostructured Polymer Assemblies

### OPTICS

- Fiber and Guided Wave Optics
- Fiber Optic Materials & Technology
- Fourier Optics
- High Energy Laser Technologies & Applications
- High Voltage Technology & Methods
- Integrated Optics
- Microelectronic & Photonic Communication Circuits
- Neural Networks & Applications
- Nonlinear Optics
- NonLinear Signal Processing Techniques
- Numerical Modeling of Electromagnetic Fields
- Optical instrumentation
- Optical Networks
- Optical Parametric Oscillators & Amplifiers
- Photonics
- SP Aspects of Optical Wave Propagation
- Target Differentiation / Tracking
- Wave Propagation & Simulation

### ROBOTICS

- Active Vision
- Image Measuring & Testing
- Intelligent Agents & Agent Theory
- Intelligent Image Sensor Systems
- Multi-Sensor Data Fusion
- Robot Control Systems & Algorithms
- Robotic Sensor Systems & Arrays

Our Web Site: [www.txis.us](http://www.txis.us)