



Complex Systems Monitoring, Modeling and Analysis Laboratory

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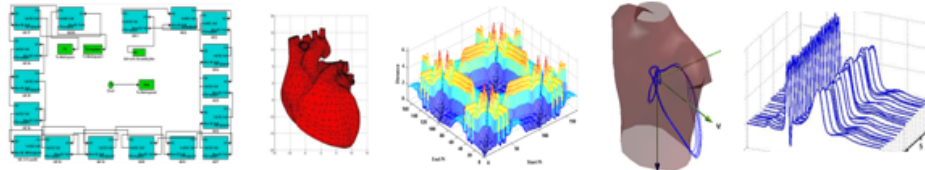


Research Roadmap

Manufacturing



Healthcare



Monitoring: wireless sensor networks,
supervisory control and data acquisition (SCADA)

Sensor-based Process Monitoring, Modeling & Analysis

- Sensor-based system informatics and process control
- Big data analytics for knowledge discovery and decision making
- Signal-level fusion for quality and reliability improvement
- Computer modeling, experiments and simulation optimization
- Sensor-based system prognosis, maintenance and optimization

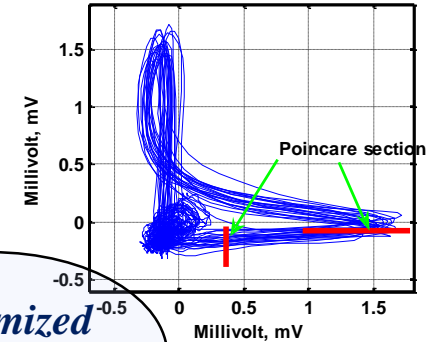
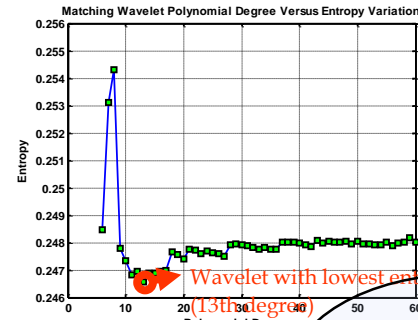
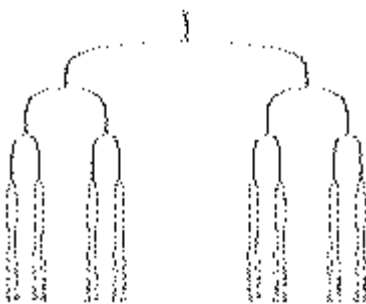
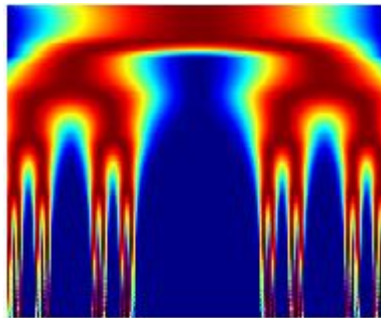
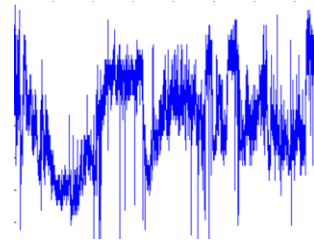
Theoretical Foundations

Nonlinear Dynamics, Statistics, Signal Processing, Simulation, Optimization, Control Theory

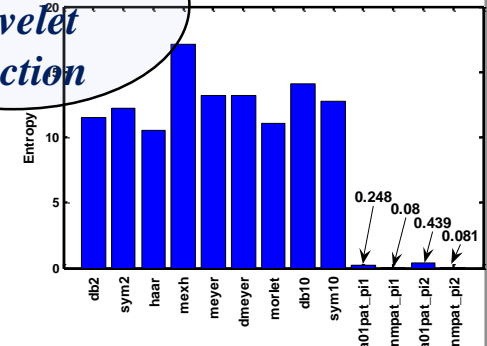
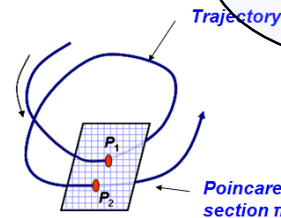


Methodology Development

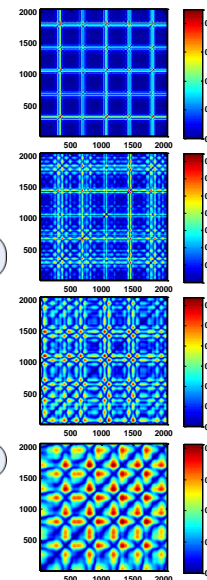
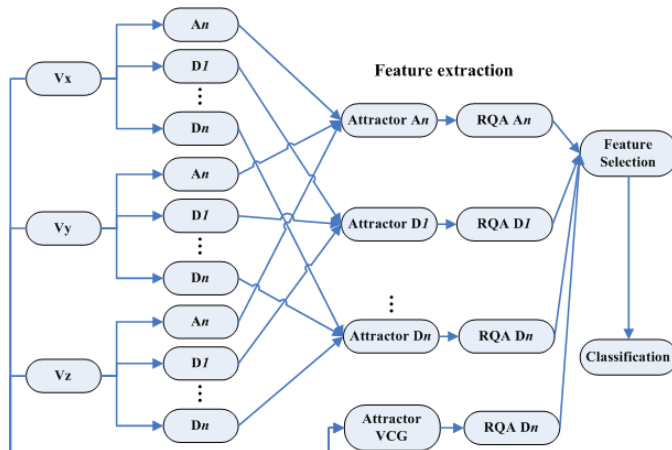
Wavelet
multifractal
analysis



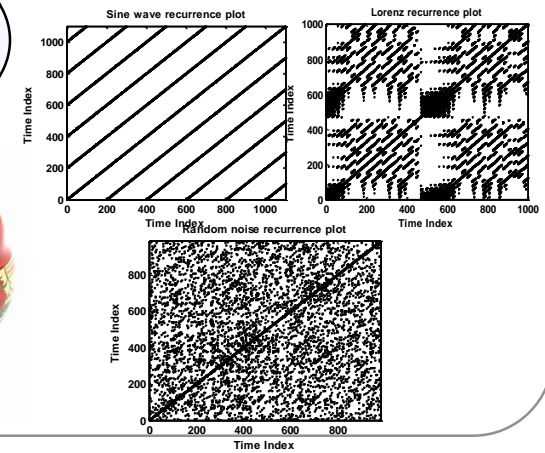
Customized
wavelet
function



Multiresolution analysis



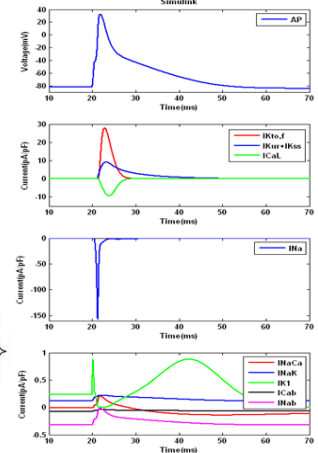
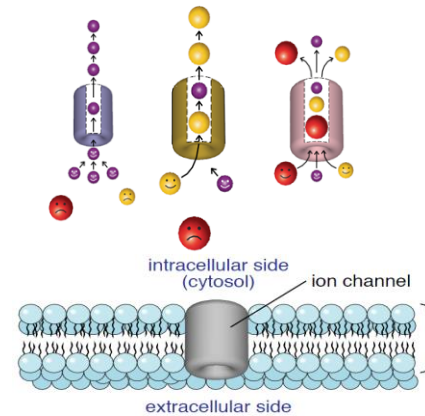
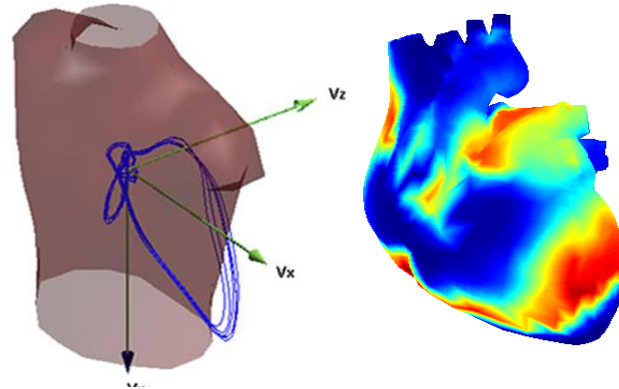
Multiscale
recurrence
analysis



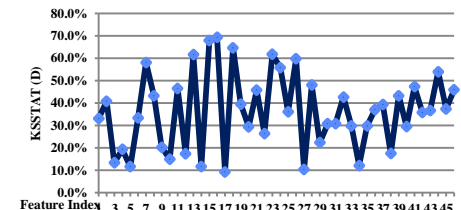
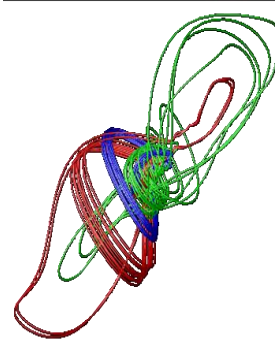
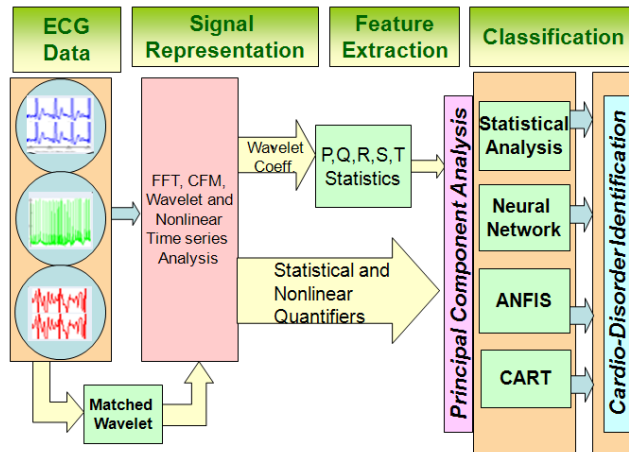


Cardiovascular Research

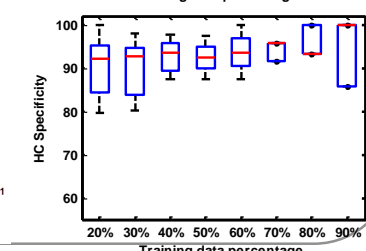
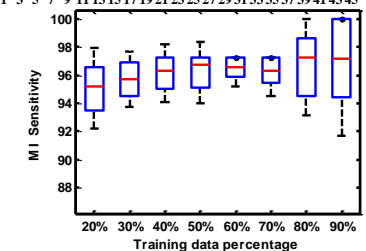
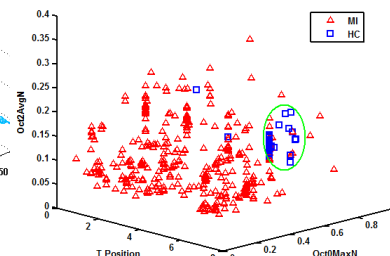
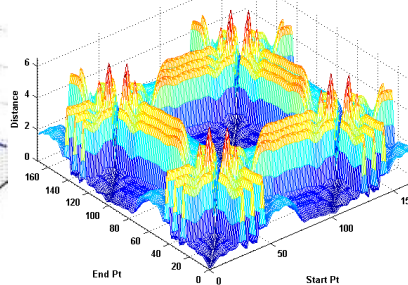
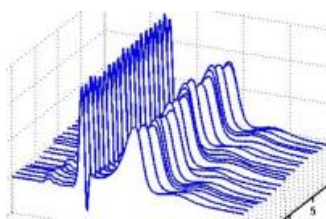
Modeling



Atrial fibrillation



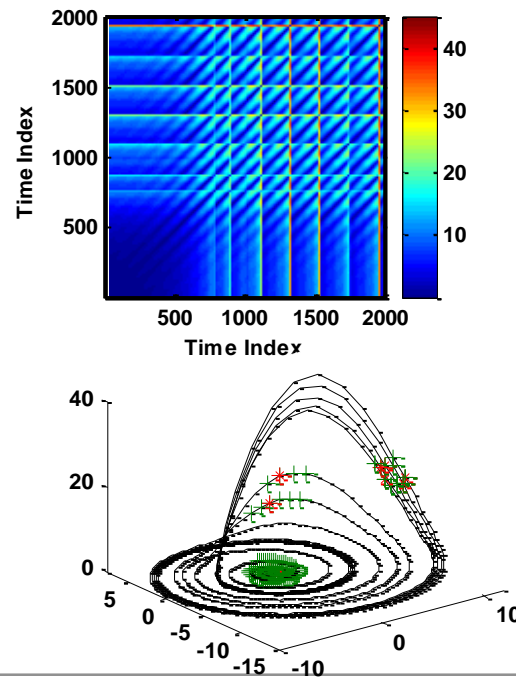
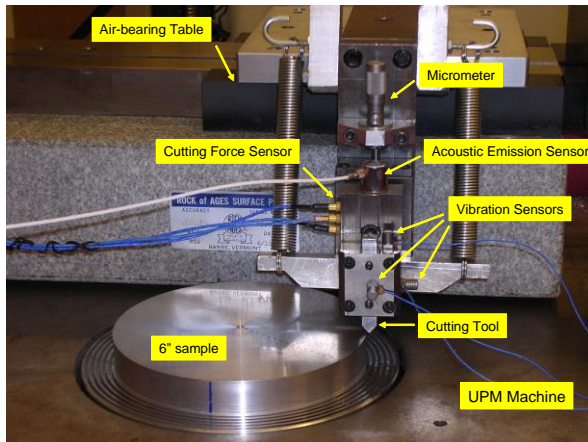
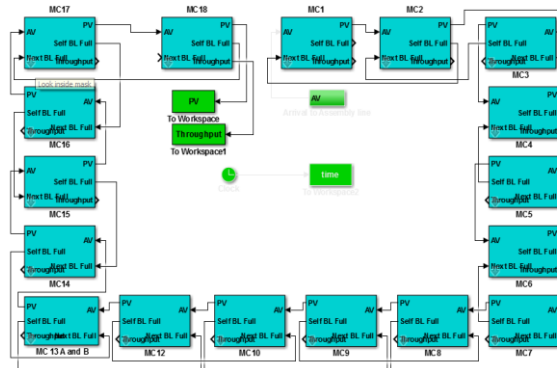
Heart Attack





Manufacturing Research

Continuous flow modeling of multistage assembly line system



Local recurrence predictive modeling

