Electrical and Computer Engineering

Signal Processing and Machine Learning Emphasis Group

Dr. John Ball — Sensor processing, Autonomy, Off-road autonomy, Deep Learning, Machine Learning, Signal and Image Processing, Active learning in engineering education

Dr. Jenny Du — Digital Image Processing, Remote Sensing, Data Compression, Neural Networks, Superresolution

Dr. James Fowler — Analysis and coding of hyperspectral imagery, Random projections and compressed-sensing of imagery and video, Representation and compression of big data, Image and video coding

Dr. Ali Gurbuz — Radar, Sparse signal processing, Compressive Sensing, Machine Learning, Machine Learning for Autonomous Systems, Off-Road Autonomy, UAV based Smart Sensing Systems, Machine Learning for Radar and Remote Sensing Systems

Dr. Robert Moorhead — Scientific Visualization, GeoVisualization, Digital Image Processing, UAV

Dr. Bo Tang — Artificial Intelligence, Statistical Machine Learning, Data Mining, Information and Signal Processing, Adaptive Signal Processing, Image Processing, Pattern Recognition

Dr. Junbo Zhao

Cyber-physical power system modeling, State/parameter estimation, security assessment and protection, Power system dynamics and stability with high penetration of renewable energy, Power distribution system situational awareness and control, Synchrophasor measurements and its applications, Big data analytics and statistical signal processing.

Dr. Junbo Zhao
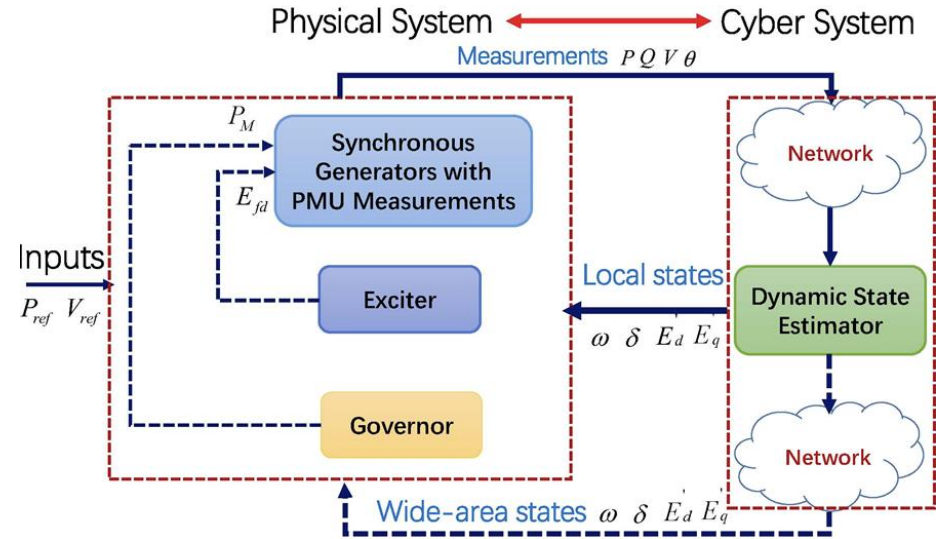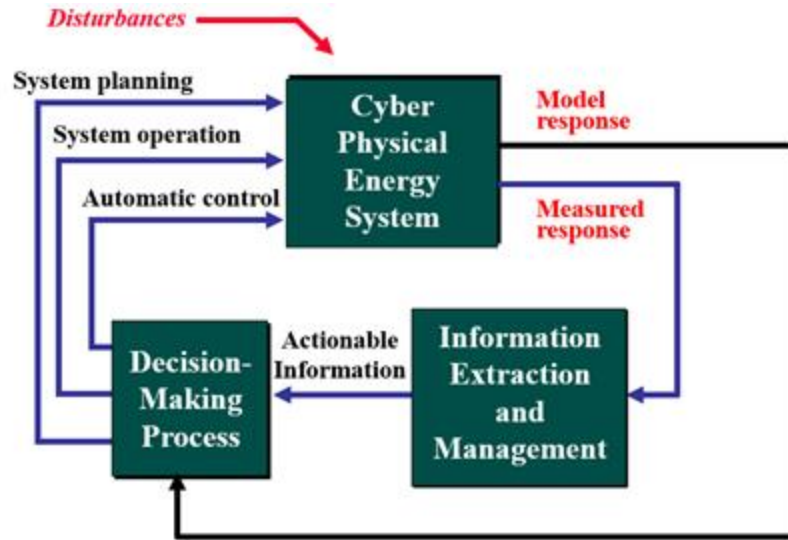
- **Robust statistical signal processing:** robust estimation theory, robust Kalman filter for state and parameter estimation

- **Physics-informed deep learning and deep reinforcement learning** for cyber-physical system prediction and control

- **Cyber-physical system anomaly detection and identification**: system events/disturbances and cyber attacks

Ali Cafer Gurbuz

Assistant Professor, Electrical and Computer Engineering, MSU

Co-director, Information Processing and Sensing Laboratory (IMPRESS)

gurbuz@ece.msstate.edu / https://my.ece.msstate.edu/faculty/gurbuz

Research Areas: Signal processing – Machine learning

- **Machine Learning**
  - Deep learning for inverse problems
  - Time-frequency domain classification problem
  - Compressed learning, dictionary learning

- **Compressive Sensing**
  - Sparsity based techniques, imaging

- **Radar/Array Signal Processing**
  - Computational Imaging, SAR, GPR, Time-Frequency
  - passive radars, cognitive radars , automotive radars
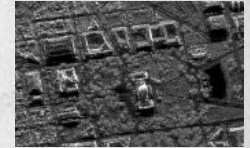 - Beamforming, DOA estimation

- **Digital Signal and Image Processing**
  - UAS based Hyperspectral, LIDAR, Thermal
  - Remote sensing

- **Mm-Wave Communications & Coexistence**
  - Sparse channel estimation, spectrum sharing,

SEVERAL CURRENT PROJECTS:

NATIONAL SCIENCE FOUNDATION
Cyber-Physical Systems

NSF-Funded: RF Sensing for Sign Language Driven Smart Environments

ERDC
ENGINEER RESEARCH & DEVELOPMENT CENTER

Off-road Autonomy

USDA
United States Department of Agriculture
Agricultural Research Service

UAS Based ML and remote sensing

New NSF Project starting @ Oct 2020

Coexistence of Comm & Passive Sensing

MISSISSIPPI STATE UNIVERSITY
JAMES WORTH
BAGLEY
COLLEGE OF ENGINEERING

Department of Electrical and Computer Eng.
Assistant Professor, Ali Gurbuz
gurbuz@ece.msstate.edu

Dr. John E. Ball

Education and Experience

PhD, EE, MSU 2007
MS, EE, Ga Tech, 1993
BS, EE, MSU, 1991
16 years industry, 6+ academia

Associate Professor and Robert Guyton Endowed Chair of Teaching Excellence
jeball@ece.msstate.edu

Teaching

Digital Signal Processing (fall 2020)
Introduction to Radar
Radar Signal Processing
Statistical Signal Processing
Sensor Processing for Autonomous Vehicles
Signals & Systems

Research Summary

Active learning in engineering education
Deep Learning
Advanced Driver Assistance Systems
Body Sensor Networks

Director of Radar Lab and co-director Sensor Analysis and Intelligence Lab

22 projects, ~$8.5M funding, **over 52 students hired for research (2013-2020)**

98+ publications