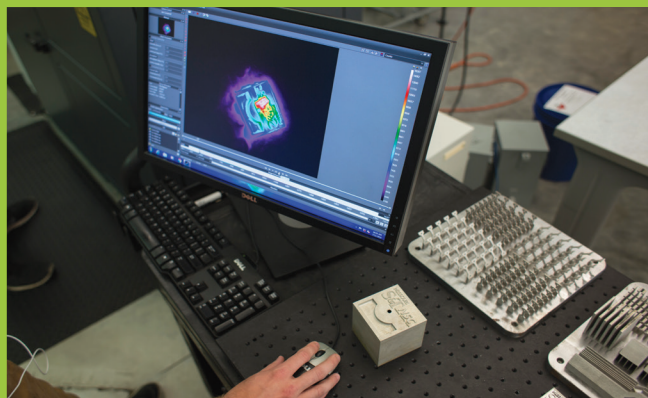




INTELLIGENT SYSTEMS CENTER

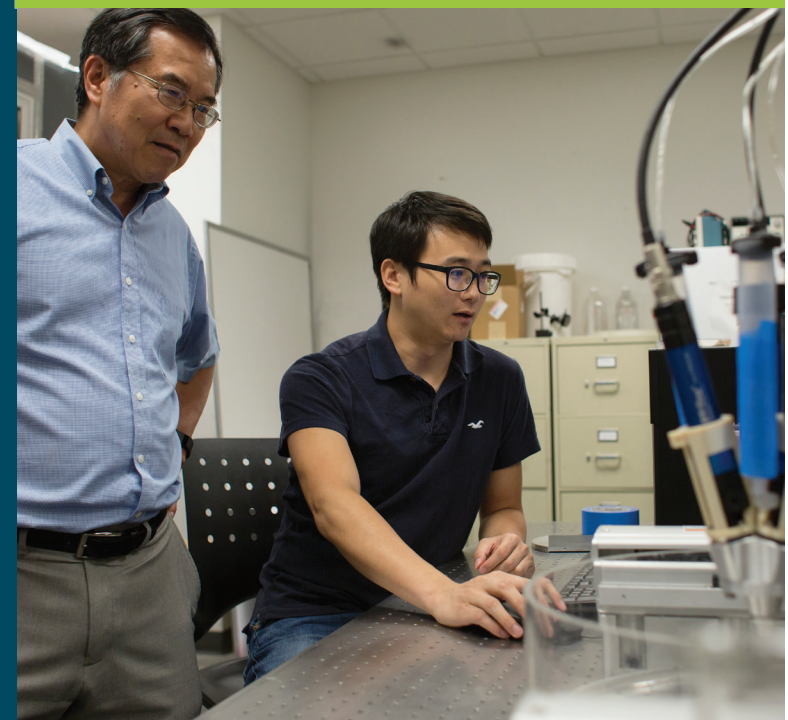
OUR LAB FACILITIES

- 1 Composite Manufacturing and Testing
- 2 Embedded Systems and Networking
- 3 Intelligent Microsystems
- 4 Laser-Based Manufacturing
- 5 Smart Structures
- 6 Software Engineering
- 7 Structural Health Monitoring
- 8 Virtual Reality
- 9 Additive Manufacturing
- 10 Web and Wireless Computing (W2C)



WE'RE MISSOURI S&T

We are Missouri University of Science and Technology—Missouri S&T for short— and we've been at the top of the research and innovation game for a long time. Founded in 1870 as one of the first technological institutions west of the Mississippi, we've been building on our heritage of discovery, creativity and innovation to equip and inspire today's students to meet tomorrow's great global challenges.



CENTER INFORMATION

**Intelligent
Systems Center**
320 Engineering Research
Laboratory
500 W. 16th St
Rolla, MO 65409-0440
573-341-4908
isc@mst.edu
isc.mst.edu

MISSOURI
S&T
ISC
isc.mst.edu

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S&T
ISC
isc.mst.edu

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DID YOU KNOW?

The Intelligent Systems Center is the home of four nationally recognized, externally funded research center of Missouri S&T including the Center for Aerospace Manufacturing Technologies (CAMT) and a site of the NSF Engineering Research Center for Future Renewable Electric Energy Delivery and Management (FREEDM), the NSF Industry/University Cooperative Research Center (I/UCRC) on Intelligent Maintenance Systems (IMS), and (I/UCRC) on Net-Centric and Cloud Software & Systems.

ISC Research has the following objectives:

- 1 Increase the intelligence of manufacturing processes and systems through modeling, sensing, control and data analytics.
- 2 Enhance the reliability, security, capacity, efficiency and stability of cyber-physical systems including manufacturing, energy and infrastructure systems.
- 3 Create advanced measurement, simulation, communications and control systems networks for applications to aerospace, automotive, mechanical, electrical and civil systems.
- 4 Employ software and automated approaches to address issues in real-world systems that require both human and machine intelligence.

Intelligent Manufacturing Processes, Equipment and Systems

Dr. Frank Liou, 573.341.4603, liou@mst.edu

Research is conducted towards increasing the intelligence of manufacturing processes and systems for aerospace, automotive, energy and other applications. Fundamental theories in modeling and simulation, sensing and control, CAD/CAM, virtual reality, and software engineering are applied to generate better understanding of emerging and critical manufacturing processes and systems for additive manufacturing, micromanufacturing, nanotechnology, etc. Research topics include: Virtual and Rapid Manufacturing, Integrated and Collaborative Design, Laser-Based Manufacturing, Composites Manufacturing, Laser Micromachining, and Liquid Metal Processing.

Intelligent Cyber-Physical Systems

Dr. Bruce McMillin, 573.341.6435, ff@mst.edu

Research is conducted to enhance the reliability, security, capacity, efficiency, and stability of cyber-physical systems in the following areas: Advanced Critical Infrastructure Systems, Simulation of Cyber-Physical Systems, and Hardware/Software Co-Design. Distributed intelligence of advanced critical infrastructures such as distributed energy, transportation and water resources are studied using formal methods for fault-tolerance, security and reliability measurement of combined cyber and physical systems which address privacy concerns and bridges between engineering and computer science.

Advanced Simulation, Sensing, Control and Communications

Dr. Jag Sarangapani, 573.341.6775, sarangap@mst.edu

Design and manufacture of microsystems and development of advanced sensors for

monitoring, diagnosis, system identification, and implementation of real-time control systems provide situational awareness, survivability, and security of mobile networks. These studies will develop and apply sensing, control and communication technologies with domain models to train assembly operators, orthopedic surgeons, military personnel, etc. and will provide applications to the automotive, mechanical, electrical and civil systems.

Computational Intelligence and Embedded Systems

Dr. Donald Wunsch, 573.341.4521, dwunsch@mst.edu

Research is conducted to extend the breadth, comprehensiveness, and scope of automated approaches for extracting meaningful information from large bodies of data such as bioinformatics, biomedical data, data warehousing and counterterrorism. Applications include automated risk assessment, robot swarms, combinatorial optimization, logistics, time-series analysis, pattern recognition and search. Studies are made to design algorithms and software for ensuring security, reliability, responsiveness, and correctness of embedded systems, mobile applications, automotive systems, signal processing methods and fault-tolerance.

CyberSecurity and Trustworthiness

Dr. Sanjay Madria, 573.341.4856, madrias@mst.edu

Research is aimed at efficient and robust solutions, software security and privacy in complex systems. An evolutionary security assessment framework is being developed to gauge the trustworthiness of system and application components. Research areas include Cloud Systems and Software; Smart Manufacturing; Cyber Physical System; Big Data Management; Wireless Networks; Embedded Systems; Social Networks; Transportation Systems; Critical Infrastructure; Smart Healthcare and Social Systems.