



University of Dayton
Research Institute



**By solving their technical challenges,
WE MAKE OUR CUSTOMERS SUCCESSFUL.**

The toughest trails are forged by the boldest of trailblazers, those committed to finding solutions when the impossible presents itself. We are the trailblazers of applied science and technology, with the capabilities to solve any challenge. With one foot in the theoretical, and the other in the practical, we create invaluable solutions to make your enterprise successful.

GIVE US YOUR CHALLENGE, AND WE'LL PRESENT A GROUNDBREAKING SOLUTION.

ADVANCED MANUFACTURING

Leading the way for advanced manufacturing technology

With expertise, brainpower, and the world's most advanced processes and machinery on our side, we yield revolutionary solutions in advanced manufacturing technology.

AREAS OF EXPERTISE:

- Additive Manufacturing
- Manufacturing Assistance and Technology Integration
- Robotics and Automation
- Smart Factory – Industry 4.0

AUTONOMY

Shaping the future of systems that learn and think

Our researchers are constructing new paths into the realm of autonomous systems that can learn, think, decide and act.

AREAS OF EXPERTISE:

- Deep Learning
- Internet of Things
- Machine Learning
- Machine Vision
- Virtual and Augmented Reality

ENERGY AND POWER

Pioneering better ways to generate, transmit and store energy

Our scientists and engineers conduct research in multiple areas of energy and power, from fuels and combustion, to alternative energy and power sources. We innovate energy technologies and materials, including ceramics, glasses, and electrical, magnetic and optical materials.

AREAS OF EXPERTISE:

- Advanced Power Components
- Aerospace Product Support Engineering
- Applied Combustion and Energy
- Bioenergy and Carbon Mitigation
- Fuels and Combustion
- Nanochemistry and Nanoengineering

HUMAN TECHNOLOGIES

Innovating solutions for human performance

Securing tangible solutions drives our passion. With tenacity, we use science to understand the intersection of humans and technology in order to improve usability, design, systems and processes.

AREAS OF EXPERTISE:

- Human-Machine Teaming
- Human Subject Research
- Usability and Interface Design
- Human Performance Measurement
- Vigilance Research
- Participant Pools
- Knowledge Elicitation and Cognitive Task Analysis

HYPERSONICS

Powering ahead at hypersonic speeds

We're making hypersonic flight a safer and more efficient reality. Through design, analysis, development and testing, we are understanding and mitigating the thermal and aerodynamic stresses involved in hypersonic flight.

AREAS OF EXPERTISE:

- Hypersonic Flow
- Hypersonic Test Apparatus
- Hypervelocity Impact Testing
- Vehicle Structures



MATERIALS

Creating reliable materials to meet any requirement

For over 60 years, we've responded to the changing needs of industry, with comprehensive research and development of the full spectrum of materials. And we've only just scratched the surface.

AREAS OF EXPERTISE:

- Advanced Composites
- Advanced High-Temperature Materials
- Advanced Materials Characterization
- Aerospace Materials Sustainment
- Coatings, Corrosion and Erosion
- Composites Manufacturing and Testing
- Fluids and Lubricants
- Laboratory Analysis of Materials
- Multifunctional Structures and Materials
- Nanoelectronic Materials, Processes and Devices
- Nondestructive Evaluation
- Sealant and Elastomeric Materials

SENSORS

Bringing valuable sensor technology for the nation and the world

Our sensor-related solutions have impacted everything from communication systems and control systems, to information processing and compression, to radar signal processing. Our sensors are smarter, reflecting the ingeniousness that brought them to market.

AREAS OF EXPERTISE:

- Information Processing and Compression
- Intelligence, Surveillance and Reconnaissance
- Open Architectures and Prototyping for ISR Deployment
- Scalable Computing
- Sensor Processing, Implementation and Research for Exploitation
- Sensor Test and Evaluation
- UAS and Embedded Systems

SOFTWARE

Tailoring solutions to meet software needs

From requirements definition to preliminary and detailed design, analysis, prototyping, testing, transition and training, rely on us to lead or support all phases of software and technology development. Our motives come from a passion to solve society's challenges: as a not-for-profit institution and objective third party, UDRI does not have a stake in a specific technology solution.

AREAS OF EXPERTISE:

- Materials Software
- Software Systems

STRUCTURES AND SYSTEMS

Increasing safety, durability and reliability by developing and applying new technology

Using both time-tested and groundbreaking techniques, our researchers and scientists find solutions to the most difficult structural and system-related challenges.

AREAS OF EXPERTISE:

- Experimental and Applied Mechanics
- Impact Physics
- Machining and Fabrication
- Structural Engineering
- Structure and Component Characterization
- Structures and Materials Evaluation
- System and Sustainment Engineering

SUSTAINMENT

Extending the service life of valuable systems

We rely on our interdisciplinary expertise to solve the problems that come with aging systems. With the goal of increased performance and reduced costs, we find quality, cost-saving solutions for improving system performance by using advanced technologies.

AREAS OF EXPERTISE:

- Electronic Systems Design
- Failure Analysis
- Life Management
- Robotics and Lasers
- Sustainment Technologies Integration



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