SOARING HIGHER

MIDDLE TENNESSEE STATE UNIVERSITY

Based within the MTSU Department of Aerospace, CUSOAR@MT is positioned to become the premier research and evaluation center for Unmanned Aircraft Systems (UAS) concepts in the Southeast.

Unmanned Aircraft Systems are already big business for the military, and the commercial potential of UAS is ready for takeoff, too. More law enforcement agencies are using drones for surveillance, and as technology advances, UAS could be used for search-and-rescue operations or even to monitor crops and livestock on large farms.

Mission

MTSU's Center for Unmanned Systems Operational Advancement and Research (CUSOAR@MT), part of the Department of Aerospace in the College of Basic and Applied Sciences, exists to provide a collaborative environment for academic, industry, and government entities to advance UAS operations and technology integration through research and development.

R&D

The primary research agenda of CUSOAR@MT is to advance operational use of unmanned systems in commercial, civilian, and military markets. Using a unique set of resources for system design, development, integration, testing, and evaluation, CUSOAR@MT provides a wide range of research services assembled for examining the potential of unmanned systems applications.

CUSOAR@MT research capabilities include the following:

- live testing in customizable environments
- simulation-based testing and evaluation
- computational evaluations
- policy evaluation
- technology assessment
- economic and market-based evaluations
- laboratory-based testing
- airspace integration research

All these capabilities are available for designing application-specific exercises or test platforms for investigating new opportunities for unmanned systems to meet a particular customer's needs.

Services

Services that CUSOAR@MT provides include the following:

- UAS flight test (payload integration and testing as well as aircraft testing)
- concept evaluation (product feasibility as well as business case development)
- component development (design, fabrication, assembly, test, and evaluation)
- Custom research (market-based and technology development)
- Currently approved Certificates of Authorization (CoAs) from the FAA include Aerosonde 4.7, Viking 400, and Scan Eagle.

Concept Analysis/ Commercialization

With a strong background in aviation research, lifecycle management, and product development, CUSOAR@MT provides **expertise** in the validation of unmanned systems concepts and the viability of commercial applications.

Specifically, our goals are to

- enhance and standardize unmanned systems training,
- facilitate adoption of unmanned systems into civilian roles, and
- provide creative solutions for validating effectiveness of unmanned systems applications.

Strategic Partnerships

Collaboration is essential for success in today's fast-changing, quick-response world. Providing access to University equipment, faculty, and training resources, CUSOAR@MT gives strategic partners a wide range of capabilities while also exposing students and faculty to emerging markets and leading organizations.

Partnership examples include

- ISR Group Inc. of Savannah, Tennessee, a recognized industry leader in conducting flight training and testing for UAS; and
- U.S. Army PM UAS, which conducts more than $2 billion worth of work in UAS and has flown over 1.2 million flight hours.

Curriculum

CUSOAR@MT is collaborating across MTSU academic departments to exchange expertise, instructors, and project support personnel for the development of Unmanned Systems-related curricula, training programs, and coursework, positioning itself to be a leader in preparing students for future careers in unmanned systems.

Academic resources at MTSU that are integral to CUSOAR@MT's unparalleled offerings include the following:

- The Aerospace Department, a top-five aviation school nationally
- The Engineering Technology Department
- Computer and Computational Sciences programs, which include a new Ph.D.
- The Geosciences Department, capable of remote sensing, including image interpretation
- The Business and Economic Research Center (BERC), Tennessee's leading economic data tracker

Additional Facilities

Facility resources at MTSU that are key to CUSOAR@MT's success include

- a rich array of agricultural properties and farms;
- a plethora of sports facilities including a 30,000-seat football stadium, the 10,000-seat Charles M. Murphy Athletic Center, and multiple indoor recreation spaces;
- **a one-of-a-kind, 360-degree seamless ATC flight simulator**—a $3.4 million asset; and
- on-campus engineering technology fabrication, electronics, and integration labs.

The MTSU Aerospace Department is developing a curriculum to lead to a bachelor of science degree in Aerospace with a concentration in Unmanned Aircraft Systems Operations.

The UAS Operations curriculum will seek to prepare graduates to lead UAS flight programs for civilian markets ranging from law enforcement to agriculture.

Students are offered an extensive background in manned aviation, UAS-related technologies, systems integration, robotics, and business analysis.

A combination of academic coursework, field experiences, and industry internships are designed to prime graduates of the UAS Operations program to launch careers in the fast-growing world of UAS.

CUSOAR@MT will work with external partners and MTSU departments to promote internship opportunities for MTSU students.

Leadership

CUSOAR@MT is based within the Middle Tennessee State University Aerospace Department, a world leader in university aviation education and research programs. The department provides the center with a unique set of facilities, knowledge, and relationships and a reputation for performing the research and education services needed by the growing field of unmanned systems.

Kyle Snyder, CUSOAR@MT director, is a faculty member in the MTSU Department of Aerospace. He formerly served as director of knowledge resources at the Association for Unmanned Vehicle Systems International (AUVSI), the largest nonprofit organization in the world dedicated to promoting, advocating, educating, and communicating about the unmanned systems industry. A specialist in technology transfer and product development in the aerospace industry, Snyder has also worked at NASA, Lockheed Martin, and Applied Systems Intelligence Inc., among others.

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