THE NATIONAL SCIENCE FOUNDATION CENTER FOR UNMANNED AIRCRAFT SYSTEMS

C-UAS

The Center for Unmanned Aircraft Systems (C-UAS) was established in 2012 and is an Industry-University Cooperative Research Center (I-UCRC) involving Brigham Young University, the University of Colorado at Boulder, Virginia Tech, the University of Michigan, Texas A&M, and Penn State University. The center is the only National Science Foundation-funded unmanned aircraft research center.

The core purpose of C-UAS is to provide innovative solutions to key technical challenges and superb training for future leaders in the unmanned aircraft systems industry. Industry member benefits include control and access to all C-UAS research, dramatic leverage of R&D funds through pooled resources with other industry members, augmented internal R&D with a cost-effective, highly-skilled graduate student workforce, and relationships with world-class faculty researchers and top graduate students/future employees.

CURRENT RESEARCH PROJECTS

1. UAS Relative Navigation with Intermittent/Degraded GPS
2. s-UAS-based Infrastructure Monitoring: Multi-Scale Flight Optimization
3. Local Air Traffic Information System (LATIS)
4. Next Generation Small UAS System and Operational Analysis
5. Multiple Aircraft Sensing System
6. Optimization of Heterogeneous Groups of Vehicles for Achieving Multiple Mission Level Objectives
7. Intelligent Visual Tracking for DAA and Counter-UAS
8. Autonomy Test & Evaluation, Verification & Validation: An Exploratory Case Study of Motion Planning & Control
9. Very Flexible UAS for Aeroelastic Data Collection and Control Development
10. Emergency Flight Planning with IoT and Onboard Sensor Data Used in Decision Making
11. Aerial Swarm Defense: A Control-Theoretic Approach
12. Simulation of Individual and Swarms of UAS Through Realistic Atmospheric Conditions
13. Run-time Assurance for Unmanned Aerial Systems using Stochastic Modeling and Reachability Analysis
14. Active Collaborative Sensing, Learning and Planning with Humans in UAS
15. Distributed Mechanosensors for Small UAS Wind Gust Sensing and Characterization
16. Novel Small UAS Flight Control through Active Flow Control
17. Verifiable Control Synthesis through Model-based Learning with Safety Guarantees
18. Guidance and Control Systems for Quad-Biplanes
19. More Accessible Safety Monitor Formal Synthesis with English-captured Requirements
20. Cooperative Informed Search using Air and Ground Systems
21. Vision-based Navigation, Guidance, and Control for Transitioning Vehicles
22. Leveraging a Viscous Vortex Particle Method to Analyze Multirotor Aircraft Configurations
23. Xilinx RFSoC for UAS Communications: Flexible Signal Processing Platform for MIMO, Antenna Diversity, GPS Anti-Jamming, and Adaptive, High Quality of Service Wireless Links