

ARCAI 2026 Special Sessions Proposal Form

Format: Maximum 4 pages. All pages are formatted to letter paper size with margins of one inch on every side. All texts use single space, Times New Roman, and a font size of 11.

Success of SS: At least 6 accepted & registered papers with authors from at least 2 independent institutions (other than the organizers institutions) should be required for each SS.

Submission: This form should be submitted to icarcai.info@gmail.com once completed.

Special Session on “Advanced Control and Autonomous Systems for Unmanned Aerial Vehicles”

Organized by

Principal Organizer(s):

Dr. Sheikh Izzal Azid – Murdoch University

Prof Hamish Campbell – Charles Darwin University

Prof Maurizio Cirrincione - Charles Darwin University

Prof Sami Azam - Charles Darwin University

➤ **Technical Outline of the Session and Topics (100-150 words):**

This session brings together recent advances in control theory, estimation, and autonomy for unmanned aerial vehicles operating in complex, uncertain environments. As UAVs expand from single-platform missions to coordinated operations across precision agriculture, surveillance, inspection, and last-mile delivery, robust control and reliable autonomy become critical. The session welcomes classical, modern, and learning-based approaches, with emphasis on safety, resilience, endurance, and real-world deployment.

Topics of the Session

- Nonlinear and robust flight control
- Transition control for VTOL and hybrid fixed-wing platforms
- Energy-efficient control for long-range and high-endurance missions
- State and disturbance estimation under wind and gust conditions
- Fault detection and fault-tolerant control
- Control barrier functions and safety-critical filtering
- Multi-UAV coordination and swarm control
- Trajectory optimization and motion planning for delivery operations
- Integration of machine learning and large language models with classical controllers
- Sensor fusion for navigation in GPS-denied environments
- Beyond-visual-line-of-sight (BVLOS) autonomy for long-range operations

Accepted and presented papers will be submitted for inclusion into Springer-Lecture Notes in Networks and Systems subject to meeting its scope and quality requirements and indexed by EI Compendex and Scopus. Selected papers will be invited to SCI Journal Special Issues.