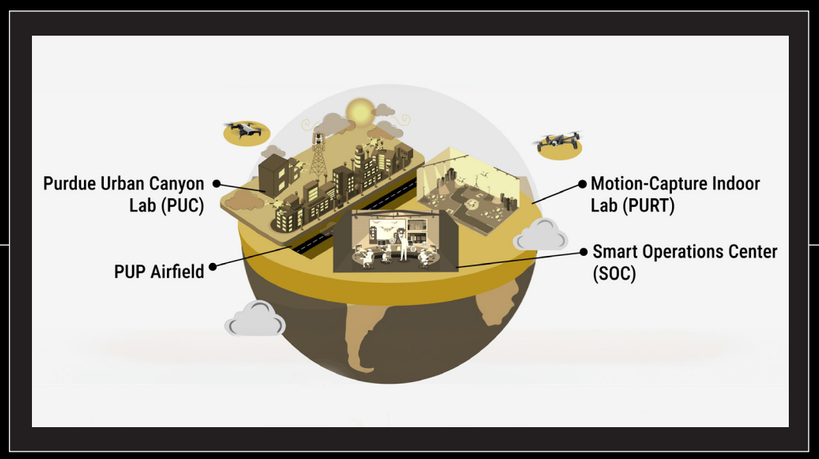
AIDA³ FACILITIES

To design and implement physical AI for next generation air mobility, AIDA³ can leverage unique research and testing facilities. **Purdue's UAV Research and Test (PURT) facility** boasts the largest indoor motion-capture facility in the world. A high-tech **smart operations center (SOC)** with a screen grid, VR/AR and smart wearables, will enhance remote research on next-generation remote operations teams, leveraging advances in neuroscience and engineering.

Purdue Urban Canyon (PUC) lab, supported by AIDA³'s Consortium Partners and grants, aims to be the largest outdoor motion-capture facility, offering precise real-time sensing, urban canyons, digital twins, and mixed-reality potentials on 12 acres.

The **PUP Airfield,** to be opened for operations 2025, will be a 1,200-foot long and 130-foot wide grass runway, with hangars and office onsite to operate our ULTRA vehicles for research purposes. The Airfield will be an FAA-registered UAV airport, and reported on airspace maps.

Researchers have access to AIDA³'s fleet of two midscale fixed-wing ULTRA platforms, named Earhart and Armstrong. These vehicles have a 31-foot wingspan, a 600-mile range, and a 200-pound payload capacity. Researchers can equip these large drones with modular sensor stacks (e.g. GNSS, SAR, Cameras, LIDAR, Hyperspectral) to study remote sensing beyond visual line of sight.



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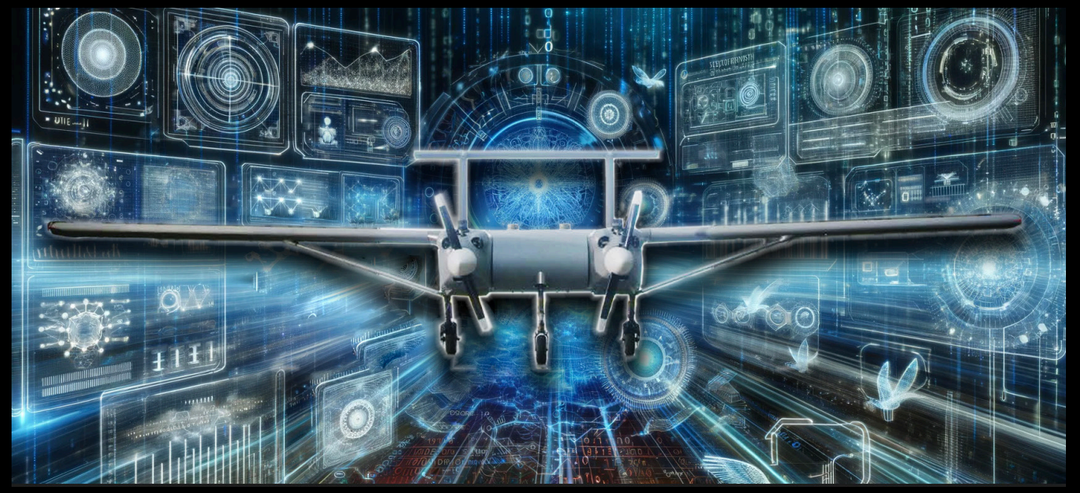
INTRODUCING AIDA³

CENTER ON AI FOR DIGITAL, AUTONOMOUS AND AUGMENTED AVIATION AT PURDUE

A NEW ERA IN PHYSICAL ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

The Purdue Center on AI for Digital, Autonomous and Augmented Aviation (AIDA³) is a hub of innovation, where cutting-edge research meets practical application. At AIDA³, we harness the power of artificial intelligence to revolutionize aviation and transportation. Our multidisciplinary team is pioneering AI and machine learning (ML) models to address industry challenges — from optimizing commercial logistics to enhancing safety in autonomous transportation.



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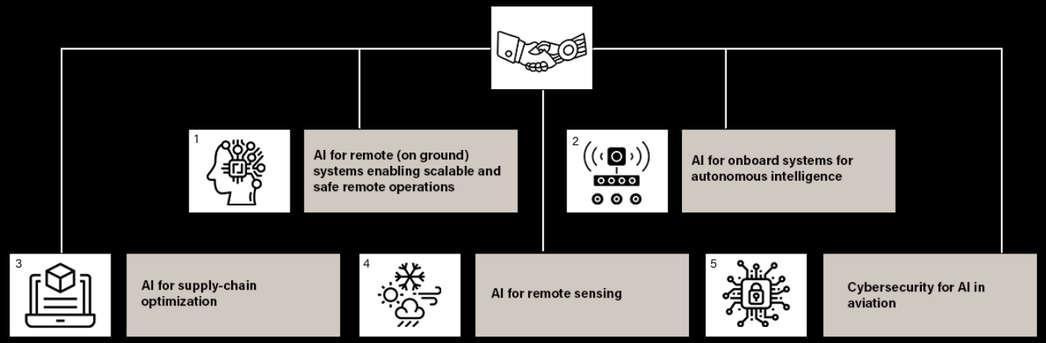
WHAT AIDA^3 DOES

AIDA^3 performs research that leads to scientific discoveries by tackling two primary challenges in leveraging AI for aviation: Increasing the autonomy and intelligence of uncrewed aerial vehicles (UAVs) and other systems used throughout the aerial value chain while ensuring economically efficient, safe and trustworthy human involvement. AIDA^3's team will realize new models and systems that allow UAVs to sense data in real-time and take independent actions in a way that they translate in trustworthy actions not just in simulated environments but in the physical world. Further, researchers will design and validate systems that pair human and autonomous systems to ensure safe and scalable operations while augmenting humans to perform novel remote tasks.

RESEARCH THRUSTS



Moving from lab to the real world, the team will design physical AI that will facilitate the collaboration between humans and increasingly intelligent UAVs across the entire value chain — from demand analytics to remote interaction with those without any expertise in aviation. UAVs, also called drones, are controlled by a human on the ground but can be flown increasingly autonomously with little direct human intervention.

AIDA^3 SOCIETAL IMPACT AND BENEFITS




Our groundbreaking research will revolutionize various sectors, significantly enhancing safety, efficiency, and collaborative capabilities in critical real-world applications. Windracers is providing Purdue with two fixed-wing UAVs, valued at $1.5 million, to be used by AIDA^3 researchers.

- Multimodal Cargo & Transportation
- Emergency Response & Public Safety
- Humanitarian Aid
- Defense
- Digital Forestry
- Precision Agriculture

WHO IS AIDA^3?

We are a multidisciplinary consortium founded by Purdue University and Windracers, with opportunities for additional partners to join. Purdue brings together four esteemed colleges and one dedicated institute, along with a team of expert faculty. Windracers, developer and operator of the ULTRA unmanned aerial vehicle platform, provides extensive experience in parcel and humanitarian aid delivery services across the United Kingdom.

PURDUE UNIVERSITY | WINDRACERS

INSTITUTE FOR **PHYSICAL AI**

COLLEGE OF **AGRICULTURE** | COLLEGE OF **ENGINEERING** | COLLEGE OF **LIBERAL ARTS** | COLLEGE OF **SCIENCE** | **POLYTECHNIC** INSTITUTE

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