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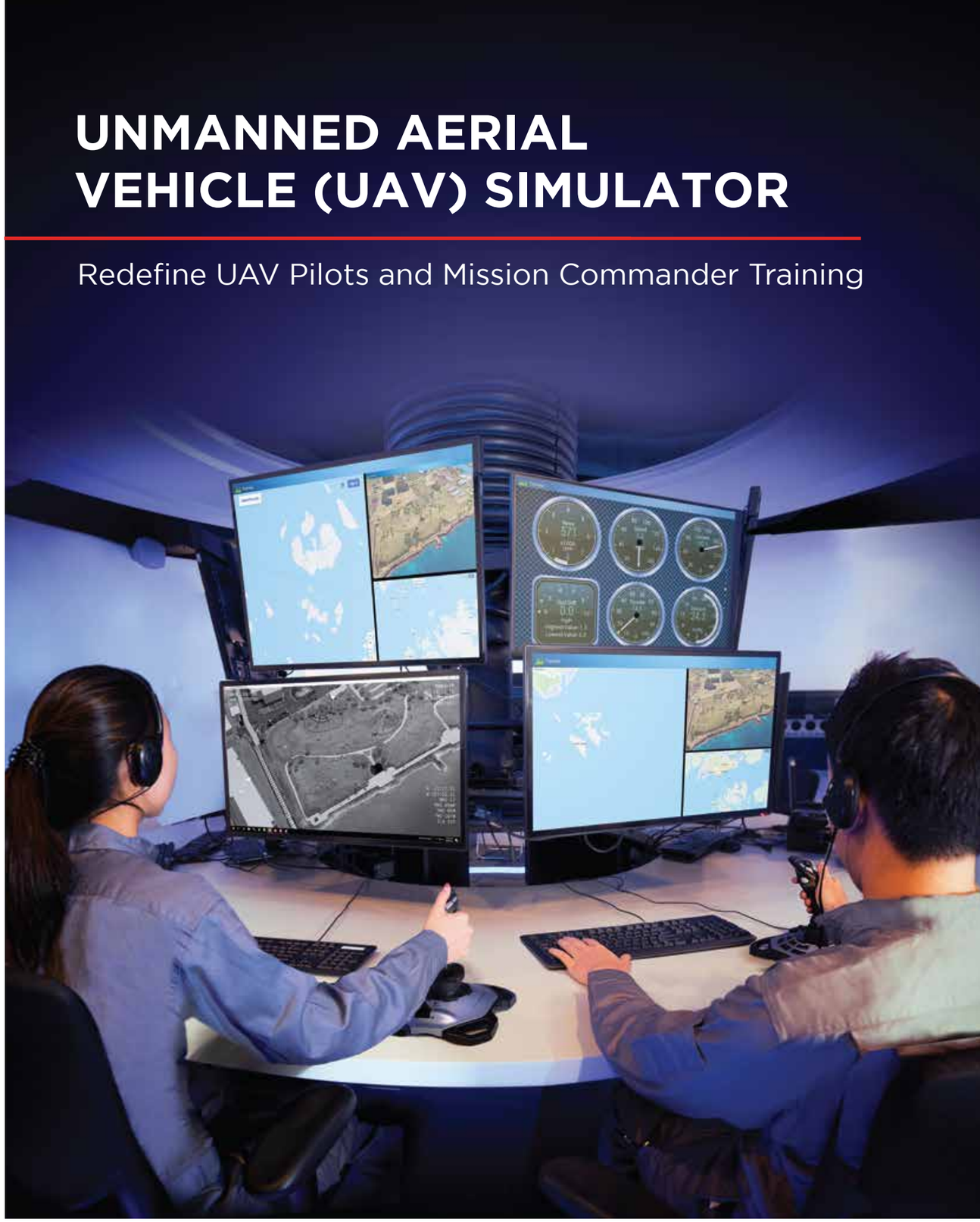
UNMANNED AERIAL VEHICLE (UAV) SIMULATOR

Redefine UAV Pilots and Mission Commander Training



ST Engineering

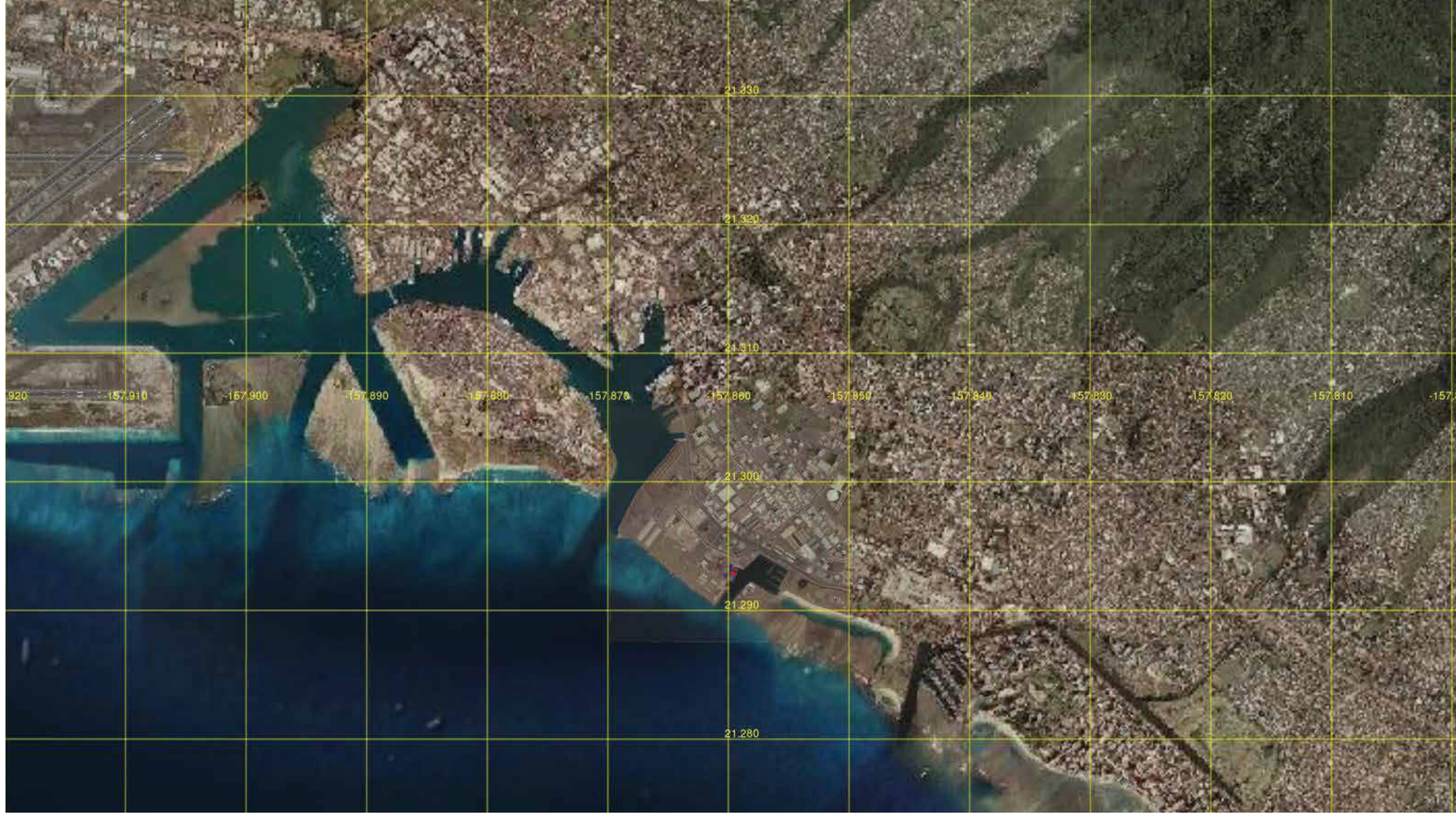
LEADING-EDGE

SIMULATION TRAINING

The Unmanned Aerial Vehicle (UAV) Simulator is a high-fidelity training solution that provides an integrated training environment that prepares the pilots for real-world reconnaissance and surveillance mission.

Designed and built to meet both the initial and recurrent training needs of pilots, the UAV simulator is able to provide both Type Training (flight operations, navigation through various weather conditions and emergency handling) and Task Training (mission specific training) across the whole spectrum of pilots.

Simulating relevant aircraft subsystem, the UAV simulator incorporates customisable visual scenarios with extreme visual realism, realistic sensor simulation such as EO/IR and SAR simulation, high-fidelity Computer Generated Forces (CGF), sensor payload operations and a comprehensive Instructor Operating System (IOS). The IOS is easy to use for scenario planning and the system is capable to monitor trainee's actions.



EO Sensor

IR Sensor

Advanced Simulation Technologies

Training Data Analytics

- Automated episode mining and contextualisation
- Integrated visual analytics for training and mission performance

Preventive Engineering Maintenance System (PEMS)

- Use of data analytics to collect utilization, network bandwidth, and system operations status to pre-empt failures
- Reduce the workload and improve efficiency of the maintenance team

Smart Computer Generated Forces

- Evolving tactical behaviour through reiterative reinforcement learning

The UAV Simulator

provides **individual** and **crew training** across different levels, to methodically and progressively build up proficiency in **UAV operations**.

Individual Training

- Procedural training encompassing pre-flight, start-up, taxi, take-off and landing
- Emergency/malfunction procedures
- UAV mission flight control and mission planning
- Sensor payload mission operating skills
- Datalink operation

Integrated Training

- Multiple same ownship UAV training
- Integrated training with other platform/systems

HIGHLIGHTS

- Emergency handling
- Realistic sensor simulation
- Rich synthetic environment simulation
- UAV handling to mission level training
- 3D virtual environment modelling
- Payload operator training
- Pilot/Operator training
- Interoperable with other simulator via HLA/DIS
- Training Data Analytics

TRAINING APPLICATIONS

MISSION TRAINING

- Search And Rescue (SAR)
- Maritime exploration
- Infrastructure security
- Law enforcement
- Anti-poaching
- Disaster relief
- Intelligence, Surveillance and Reconnaissance (ISR)

PILOT TRAINING

- Ab-initio training
- Emergency/malfunction training
- Sensor payload training
- Image interpretation
- Crew/Cockpit Resource Management (CRM)

SPECIFICATIONS

External Pilot Station (EP)

Full-sized replica operator controls with accurate functionality

Immersive audio-visual experience

Multiple speakers around the dome to simulate aural cues during take-off, in-flight, landing, and atmospheric environment sounds such as:
- Rain
- Wind
- Thunder

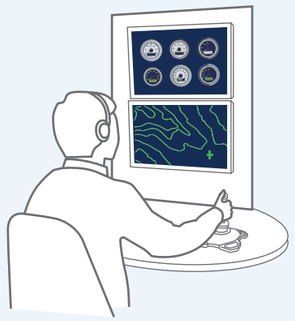
Up to 11 Full High-Definition (FHD) projectors providing large FOV

Distortion-free seamless imagery using Geometry correction (warp) and edge-blending (blend)

Covers 240 degrees horizontal FOV and 135 degrees vertical FOV

Dome display surface with 3.5 metres around the nominal EP eye-point

Internal Pilot Station (IP)



Allows UAV flight exercise rehearsal prior to actual field deployment

Exact replica with full control of the UAV and mission operations

Handling of UAV flight control and sensor payload (search, detect and identify) to achieve mission objectives

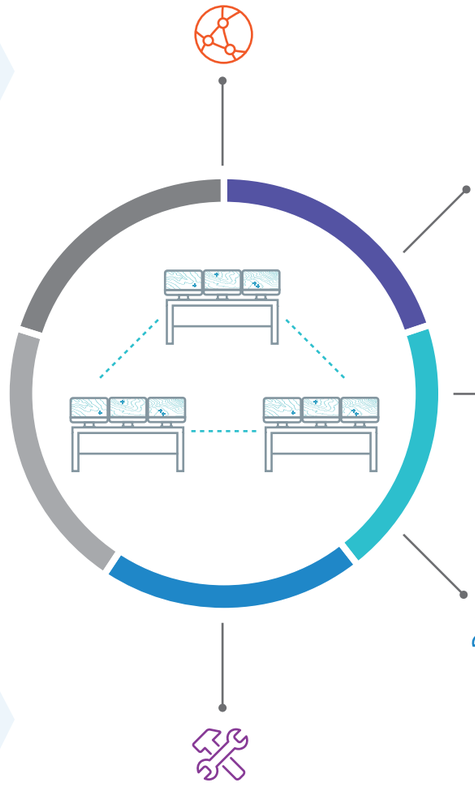
Execution of UAV mission

Electro-Optical (EO) and Infrared (IR) sensor payload images tuned with accurate payload data

Simulate all sensor performance and tracker logic of the sensor payload to support mission training

Support all sensor effects such as noise, brightness, gain and contrast

Hi-fidelity Flight/Datalink Simulation
- Flight models tuned from real data
- Flight dynamic model with 6 physics-based Degrees of Freedom (DoF) motion module
- Transfer of control between station and UAV
- Line of Sight (LOS): range and communications interference



Customised Visual Database
- High resolution terrains
- Geo-specific features and 3D models
- Detailed airstrip scene details to optimize mission

HLA/DIS Distributed Architecture
- Ease of connection to other simulators
- Integrated training
- Local and long distance connection between sites

Synthetic Environment with Customised Entities
- Air, ground and surface activities populated by CGFs
- Natural environment simulations
  - Day/night effects
  - Light points and ownship landing lights
  - Global and local weather conditions
  - Atmospheric conditions
  - Visibility effects

Support and Maintenance
- Full integrated and embedded suites for lesson plan, mission preparation and management
- Online monitor and diagnostic tool
- Offline calibration tools