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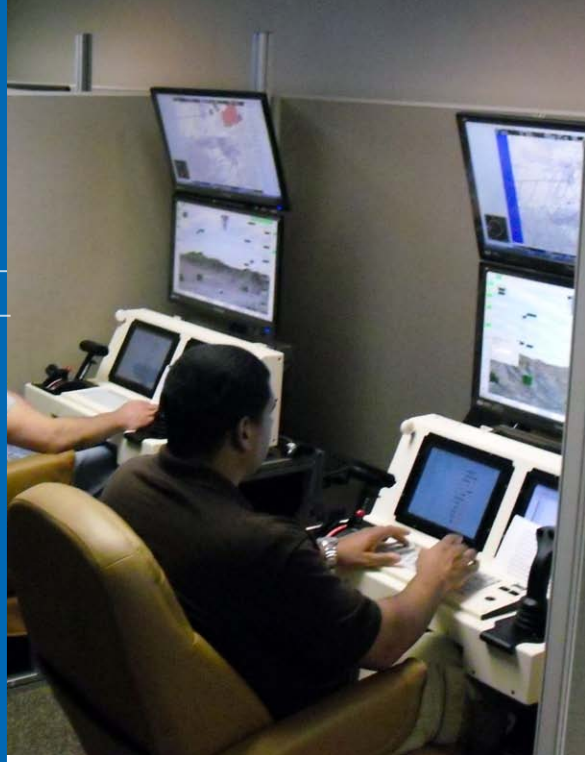


X-Gen™ Generic Unmanned Aircraft System Trainer

HIGH FIDELITY UNMANNED SYSTEMS SIMULATION

URS has designed a High Fidelity Virtual Training and Testing System focused on supporting the unique requirements of the commercial/civil community. X-Gen™ incorporates the latest technology for training payload and air vehicle operators from basic through full operational, location specific training, and rehearsal procedures. X-Gen™ is based on URS' proven image generator software for real-time scene rendering of the sensor views. It also has an open architecture design which provides a programmable 6 DOF aero-model that supports any multiple air vehicle control, menus, cued symbology, and 2D map display. X-Gen™ can be scaled to run on a laptop, desktop, or full GCS configuration. Users have the capability to design and train on custom scenarios as well as add future updates.

X-Gen™ is adaptable to meet the diversified training needs of universities, municipalities, law enforcement agencies, and commercial organizations without the burden of data rights restrictions. X-Gen™ supports multiple air vehicle payloads with tunable sensor characteristics simulating any Electro Optical, Low Light TV, and Infrared sensor including sensor-fusion.

Air Vehicle Operation Features

- Automatic Flight Control System (AFCS)
- 2D map display
- Route planning
- AV checklist operations
- Point-and-click Navigation
- Airspace situational awareness
- High fidelity air vehicle modeling

Payload Operation Features

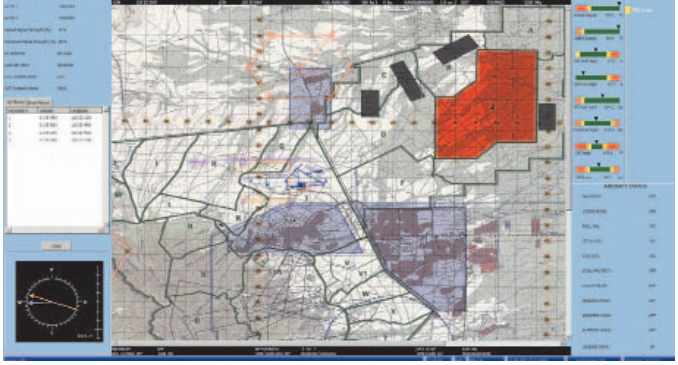
- Selectable, vehicle specific symbology
- IR - TV - EO payload sensor views – pan and zoom
- Electronic/digital zoom and focus
- Geo-stabilized point and entity tracker
- Sensor Fusion IR & TV – IR & EO
- Laser ranging and designation
- Contrast based Image Auto-Tracker (IAT)

Generic UAV/RPA Parameters

- Multiple air vehicles; fully tunable in size, endurance, weight or payload
- Common User Interface (GUI & Hardware all COTS) – no OEM or other data rights conflict
- Pilot or Sensor modes selectable on a single workstation

Instructor Operating Station (IOS)

- Network control of up to sixteen independent stations
- Scenario and lesson plan selection
- Atmospheric effects control
- Multiple cloud, fog, and haze layer models



- Geographical based continuous time of day
- Activation/deactivation of emergency procedures
- Automated monitoring and logging of trainee actions
- After Action Review (AAR) record/replay capability

Generic Heads-Up Displays (HUD)

- Toolbar bezel around the perimeter of the monitor window
- Several action buttons to control the vehicle pilot functions
- Several action buttons to control/select various sensor functions (gain, level, sensor type, focus, etc.)

Real-Time Rendering Engine

- Renderings of 400,000 fully-textured, shaded and anti-aliased polygons per channel, peak performance of over 1,500,000 polygons at 60 Hz
- Renderings of 100,000 light points in day/night/dusk
- Synchronized multi-channel capability
- Auto-alignment and channel edge blending
- Database paging and texture compression
- Full scene anti-aliasing for superior artifact control
- Anisotropic texture filtering increasing texture resolution
- Shader-based light point simulation increasing realism
- Pixel level procedural and texture based light sources
- Multiple light sources (ambient light, landing lights, etc.)
- Dynamic scene management
- FOV based dynamic LOD control
- Real-time texture animation & unlimited levels of occulting
- Integrated Boston Dynamics DI-Guy© real-time simulation

Special Effects

- Highly realistic tactical & cultural effects
- Emissive and reflective surfaces
- Multi-layer order independent transparency
- Dynamic shadow rendering of scene entities
- Effect, color, and size characteristics are correlated to associated database material
- GUI based special effects (XFX) composer

Semi-Automated Forces (SAF)

- Multiple SAF Support
- Fully correlated SAF

Standard Interfaces

- Distributed Interactive Simulation (DIS)
- High-Level Architecture (HLA)
- Common Image Generator Interface (CIGI)

Sensor Modeling

- Realistic sensor simulation
- IR - TV - EO payload sensor views
- Sensor Fusion IR & TV - IR & EO
- Electronic/digital zooms and focus
- ROC-V modeling with controllable IR hotspots
- Tunable device specific effects; noise, focus, brightness, AC coupling, polarity, auto/manual gain and level
- Contrast based Image Auto-Tracker (IAT)
- NVG simulation night imagery

Atmospheric & Weather Effects

- Comprehensive weather and atmospheric effects
- Multiple lightning and volumetric thunderstorm models
- Directional and dynamic snow/rain models
- Volumetric clouds and lighting and physically accurate fog and haze layer models
- Continuous and static time of day
- Ephemeris models

Mission Functions

- Tactical terrain server processes up to 160,000 concurrent requests per second
- Surface material code feedback to host for ice, rain, etc.
- 100,000 height of terrain calculations per second
- 11,000 collision detection calculations per second
- 20,000 laser range calculations per second

Application Programming Interface

- API portable source provided
- Scripting Engine
- After Action Review (AAR) record/replay capability
- 3D sound

Databases

- Extensive libraries of world-wide, geo-specific, high resolution databases
- Support for geodetic exported terrain
- Rapid placement of database features using the Environmental Modeling Editor (EME™) for fast turnaround and reduced cost
- Stenciling of airfields
- Real-time tessellation

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