



Laboratory for Autonomous Systems Research



“We will pursue unmanned systems as an integrated part of our force, ensuring that the move to ‘unmanned’ truly reduces personnel requirements.” CNO, 2010

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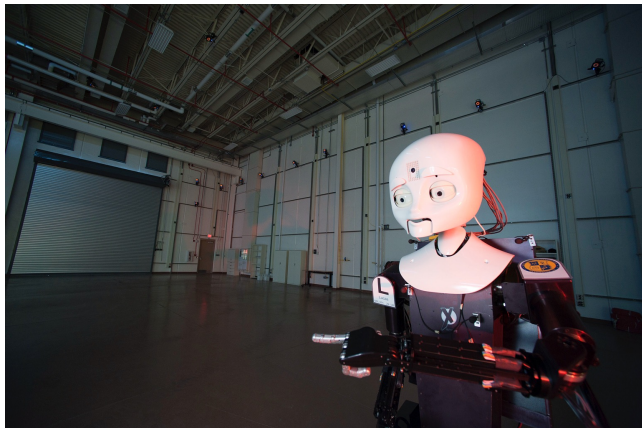
LASR Video





Reconfigurable High Bay (150'x75'x30')

- Operation of ground and air vehicles and human interaction
 - High resolution tracking system - 50 objects @ 120hz, resolution < 1mm, < 1/10°)
 - High speed cameras
 - 3D audio system
 - GPS repeaters/simulator
 - Floodable area
 - Overhead crane
 - Wall mounting system,
 - 4 human-system interaction labs overlook high bay





Desert High Bay

- The Desert High Bay provides a simulated desert environment featuring:
 - 3' sand pit and rock walls
 - Wind generators / blowing sand
 - Variable lighting including night time conditions and high contrast, low angle high intensity lights
 - GPS repeater
 - Overhead crane





Littoral High Bay

- Pool 45 'x '25' x 5.5'
 - 16 channel wave generator and adjustable slope + sand/rock/mud
 - Underwater tracking system and high resolution cameras on order
- Sediment tanks: 16', (3) 5', 40'x3'x3'
- GPS repeater
- Overhead crane





Tropical High Bay

The Tropical High Bay provides a simulated southeast Asian rain forest including water features in an enclosed greenhouse.

- ~80° F / 80% RH
- Rain generation up to 6"/hour





Human-Systems Interaction Labs

(4 labs, 20'x40' each)

- For experimentation of interaction between people and teams of autonomous systems
- Features: Multi-user, multi-touch displays, variety of high-resolution displays, eye-tracking equipment, overhead mounting pipework above ceiling, metals shutters can be lowered to protect glass or to perform remote operation experiments, or opened for control of experiments





Outdoor Upland Forest

- 1/3rd acre simulated high land forest for experimentation with ground vehicles
 - Water features including waterfall, stream and pond, interesting topography, boulders, both isolated and arranged as box canyon





Power and Energy Lab

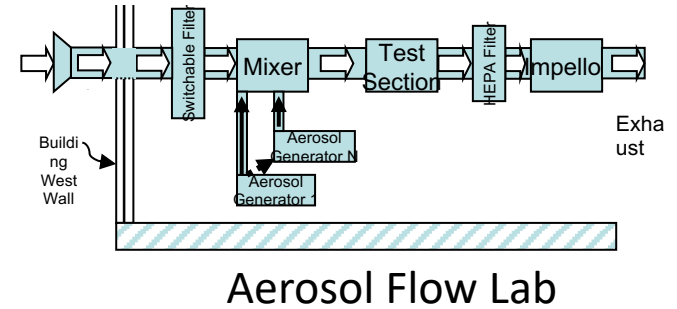
- Features:
 - Battery Dry Room (1% or less)
 - 6' Glove Box
 - Small Solar Simulator
 - Vacuum Oven
 - 4' Fume Hood
 - 6' Fume Hood





Sensor Lab

Features: 8' Walk-In Fume Hoods (2), 8' Fume Hood, 4' Fume Hood, 6' Horizontal Laminar Flow Hood, 10' x 10' x 9' 6" Anechoic Chamber (RF/acoustic), Small Environmental Chamber (pressure), Large walk in Environmental Chamber (temperature), vapor generators, autoclave, BioSafety Cabinet, freezer, refrigerator, chemical storage cabinets





Mechanical and Electrical Shops

- Knee mill (adding CNC capability), vert and horiz band saws, drill press, lathe, panel saw, joiner, planer, etc.
- Prototyping machines, 3D printer and scanner



NRL Collaboration Opportunities

- Swarm and Counter-Swarm Robotics
- Quadruped and Hexapod Locomotion
- Tactical Applications of Small Unmanned Aerial Systems (SUAS)
- Autonomous Underwater Vehicle Control
- Multiagent Planning for ISR
- Signal Processing for Acoustic Sensing
- Other Navy Application Domains

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