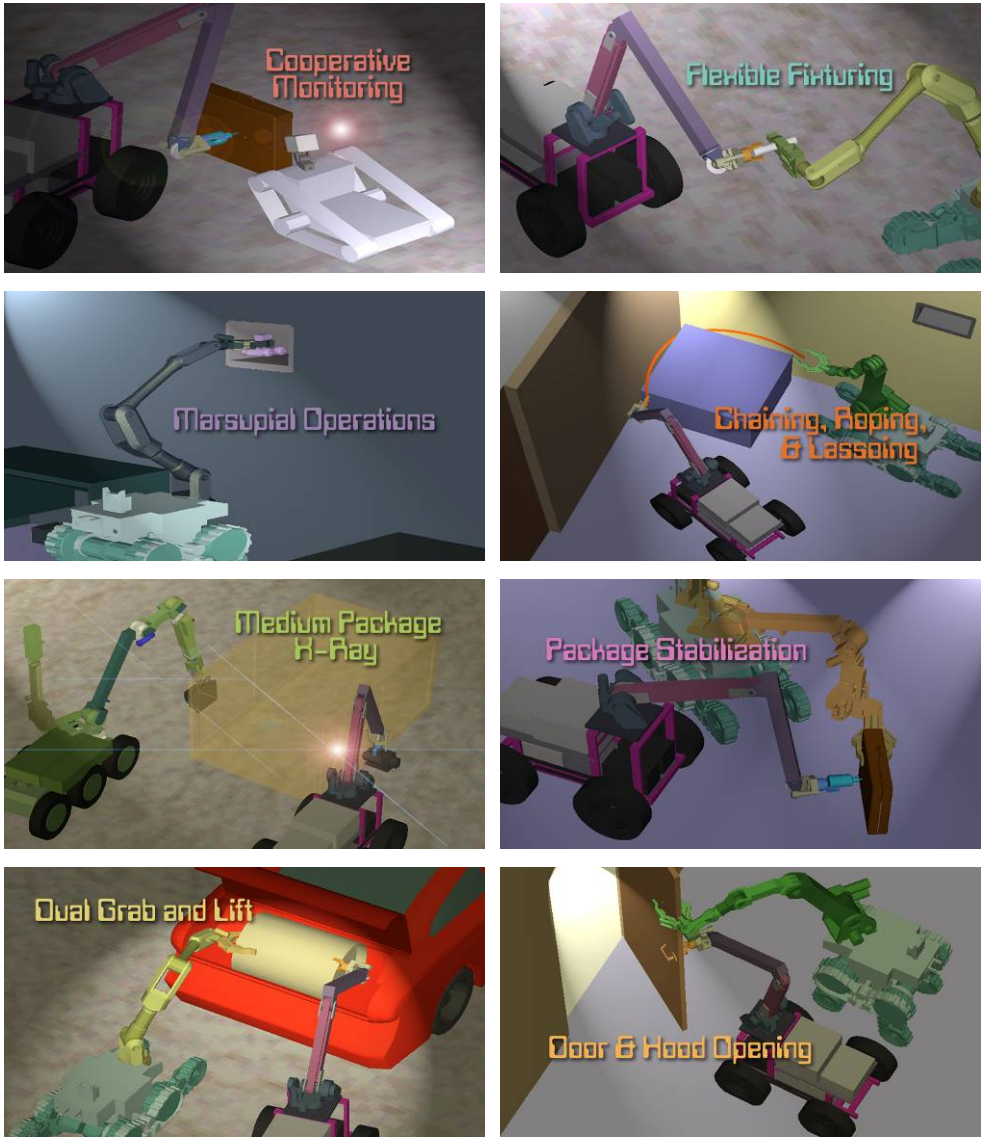
Multi-Robot Cooperance

- Cooperative monitoring
- Flexible fixturing
- Pack mule
- Marsupial operations
- Chaining, roping and lassoing
- Medium package x-ray
- Large item x-ray
- Package stabilization
- Dual grab and lift
- Cooperative door/hood opening

Remote Assembly LDRD



Shipboard Robotic Coating

Challenge:

Repainting Aircraft Carriers

Use existing Navy-procured equipment

- ***33' Schilling hydraulic arm***
- ***11 DOF***

Technologies:

SMART controller

Structured light modeling / registration

Automated planning / programming

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ARMMS and Flail

Accident Response Mobile Manipulation System (ARG asset)
Video

2002 Mini Flail conversion to Manipulator using JAUS
(JPO UGS, Combat Engineers)

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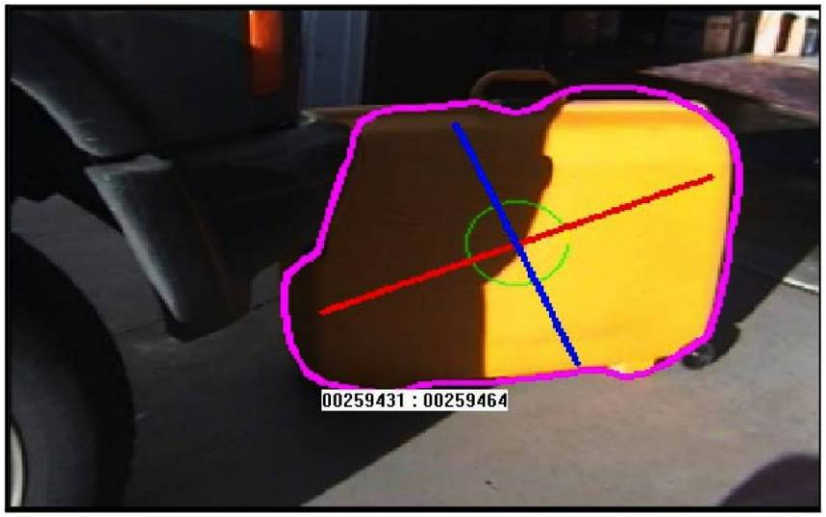
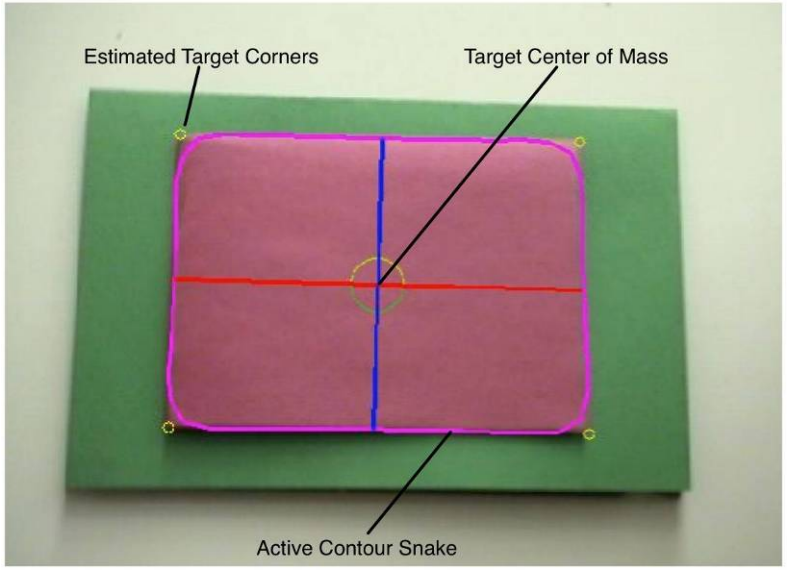
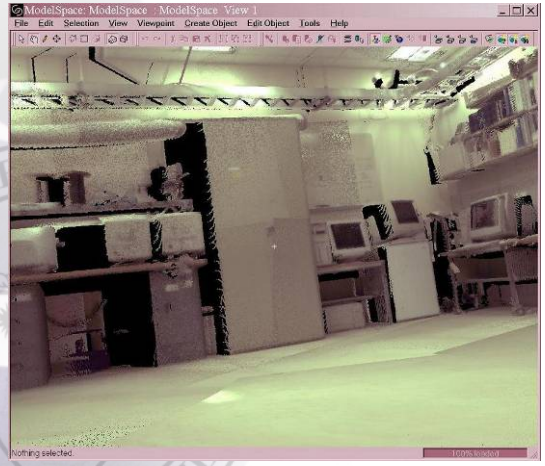
Visual Servoing enables inexpensive, autonomous target/obstacle tracking

- Tracks movement
  - Target object
  - Platform
  - Relative motions
  - Real-time
- Targets center of mass
- Inexpensive
  - Single color camera
- Robust
  - Changing shape
  - Changing shading
  - Changing aspect ratio

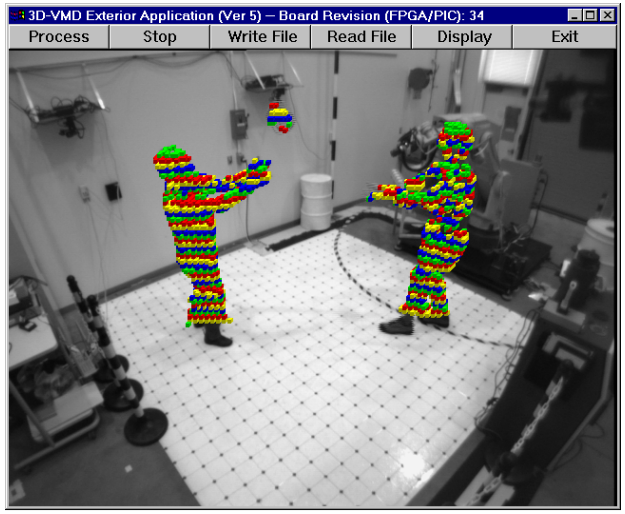




Perception Projects

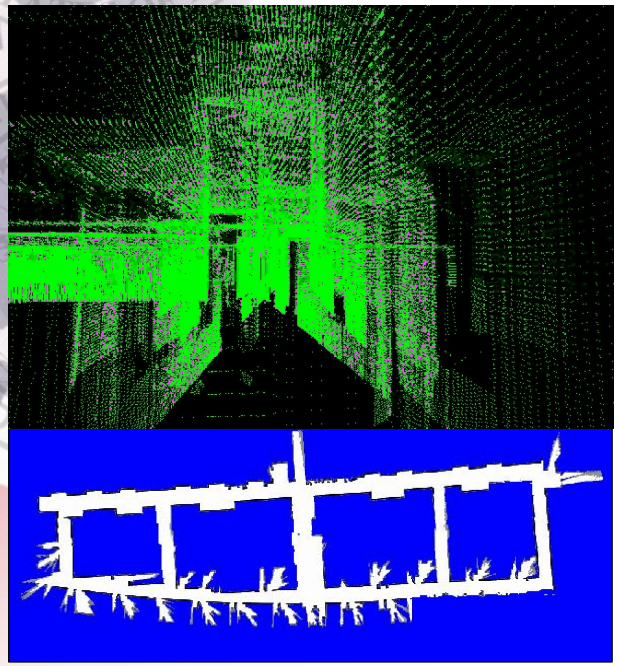


Geometric Modeling & Texture Mapping



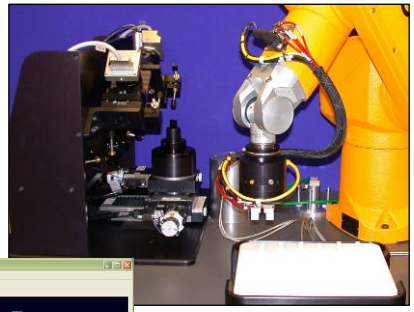
Real-Time Shape Tracking

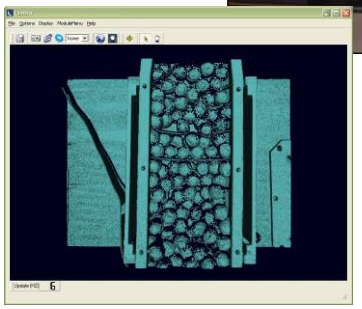
Facial Recognition



Simultaneous Localization and Mapping

Neutron Generator Part Inspection





Submunition location and identification

Augmented Reality

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