

# **Autonomous Negotiation Teams and Network Embedded Software Technologies (ANTS/NEST)**

**Alex Meng**

**703-983-5591 • [meng@mitre.org](mailto:meng@mitre.org)**

**DARPA/ITO**



# Problem

- **How to use and manage large numbers (from 100 to 100,000) of resource-limited sensors (and actuators) in sensor-rich environment?**
  - **problem of “sensor rich, information poor”**
  - **problem of sensor coordination and information fusion**

# Background

- **DARPA Thrust on Embedded Information System**
  - **Autonomous Negotiation Teams (ANTS)**
  - **Networked Embedded System Technology (NEST)**
  - **Model-Based Integration of Embedded Software (MoBIES)**

# Objective

## ■ Resource Management- ANTS

- peer-to-peer negotiation, bottom-up team formation

## ■ Distributed Control: NEST

- closed loop interactions, timing and coordination services

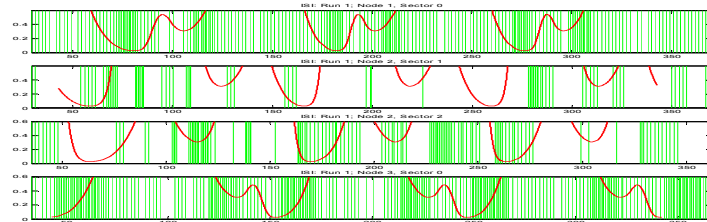
## ■ Design Tools: MoBIES

- Model-based integration of multiple design views, and framework integration

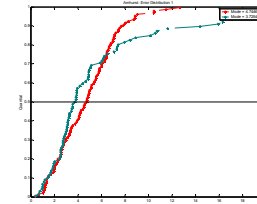
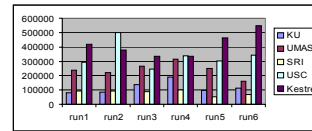
# Activities

- **Challenge Problem and Experiments**
  - **define platform and scenarios**
  - **define test cases and evaluation metrics**
  - **collect experiment data**
  - **analyze data**
  - **validate technical approaches from experiment data**

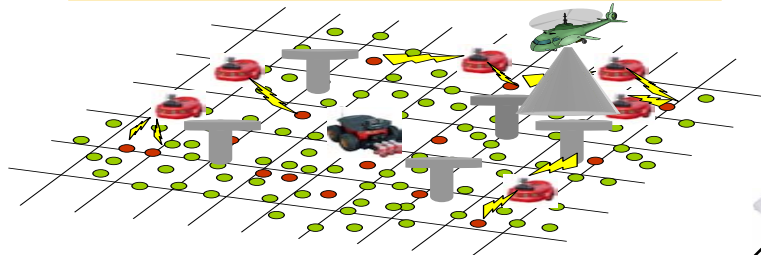
# Highlight



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## Distributed Pursuit Evasion Games (DPEGs)

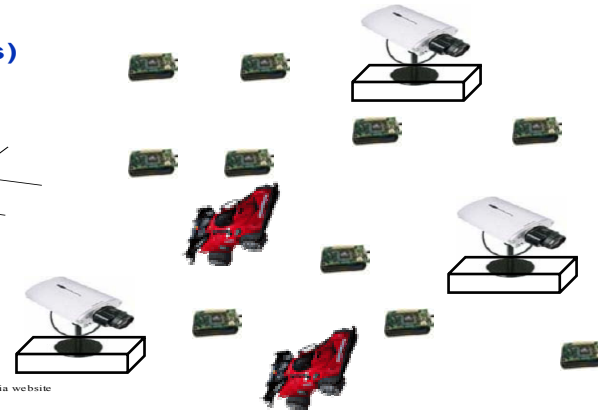


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Nest Retreat, Tahoe City

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\* Robot pictures from ActivMedia website



# Highlight/Demonstration



# Impacts

- Provides evaluation feedback to DARPA on the progress of ANTS and NEST research from common Challenge Problems.
- Lead the transition for ANTS to package the research work in a readily demonstrable form for transition
- Keep MITRE abreast of Netted Sensing research

# Future Plans

