



Heterogeneous Sensor Webs for Target Recognition & Tracking in Urban Terrain (FY06 MURI)

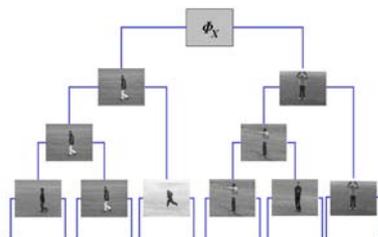


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Counter-clockwise from top:

- 1) Automatic urban modeling
- 2) Tracking mobile units
- 3) Fast recognition and indexing of human actions



OBJECTIVE

Develop computationally feasible target recognition and activity assessment procedures for bandwidth- and power-limited ad-hoc wireless networks of imaging and non-imaging sensors in urban/cluttered scenarios

DOD CAPABILITIES ENHANCED

- Target recognition/tracking/monitoring in cluttered and occluded urban scenarios

SCIENTIFIC/TECHNICAL APPROACHES

- Integrate imaging and non-imaging sensors
- Balance sensor- and network-based processing under power and bandwidth limits
- Develop optimal algorithms for target detection and activity tracking using new tools from supervised and unsupervised learning
- Develop mathematically justified, computationally feasible and practically useful performance metrics using tools from random graph theory

ACCOMPLISHMENTS

- Team-theoretic message-passing algorithms for distributed decision-making
- Audio/visual fusion experiment: outdoor target tracking with 6 audio and 3 video sensors
- Real-time tracking of mobile sensors using RF Doppler shift (see graphic)
- Automatic urban modeling (see graphic)
- Robust face ID system that compensates for image distortion, degradation and occlusion
- Close-to-real-time human-action recognition and indexing (see graphic)