

Netted RF Sensors

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MSR

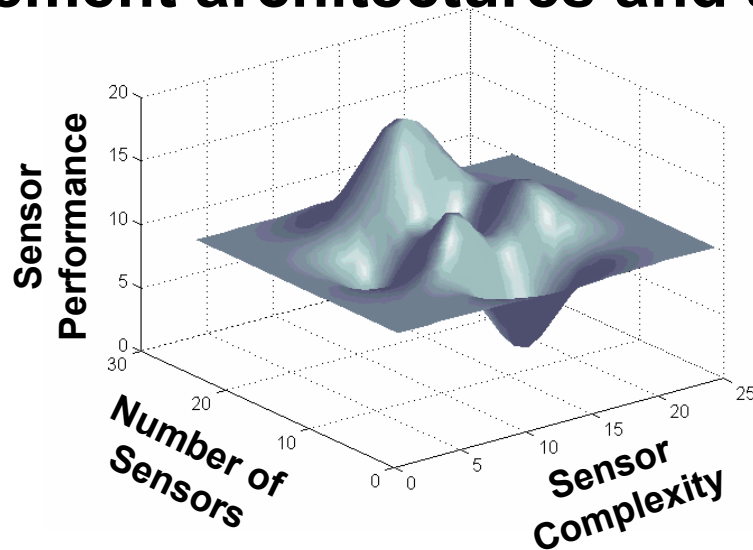
 MITRE
Technology
Program

Problem

- **The validity of the assertion that a network of sensors provides greater performance than a single large sensor or the sum of the individual sensor's performance is unknown.**
 - **No general theory exists to validate this supposition.**

Background

- **Netted sensor research seems to be focused on the development of individual sensors, networking, communications, and resource management architectures and algorithms**



Reality: The topology of the trade space is not known

Objective

- The objective of this research program is to develop principles for **optimizing the performance of netted sensors**
- Focus on the sensor and data exploitation aspects of the netted sensor problem through the use of RF sensors
- Explore the trade space of the problem using modeling and simulation and experiments
- Extend the observation from the specific domain to the general domain

Activities

- **Develop a modeling and simulation testbed**
 - **Simulate battlefield scenarios with multiple RF sensors detecting ground vehicles**
- **Conduct experiments with commercially available, low cost, low power RF sensors**
- **Evaluate netted RF sensor performance and explore the trade space**
- **Extend the domain specific observations to a general theory of netted sensors**

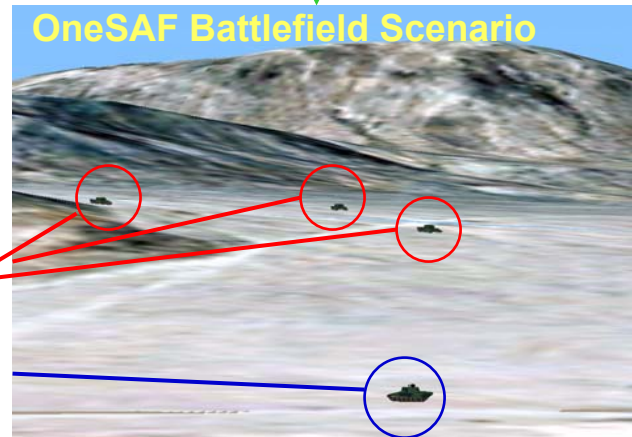
Highlight

Modeling and simulation testbed can model battlefield scenarios. Distributed RF sensors can import data to a radar tracking algorithm.

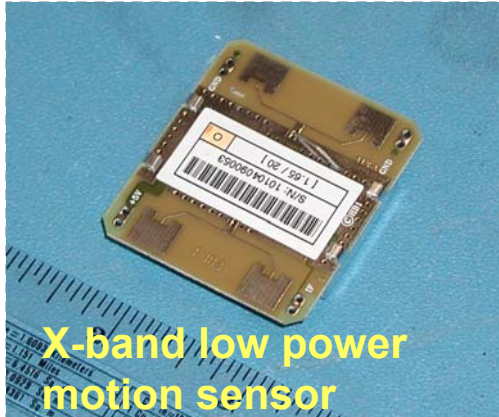


DTED and satellite imagery are combined to form terrain databases

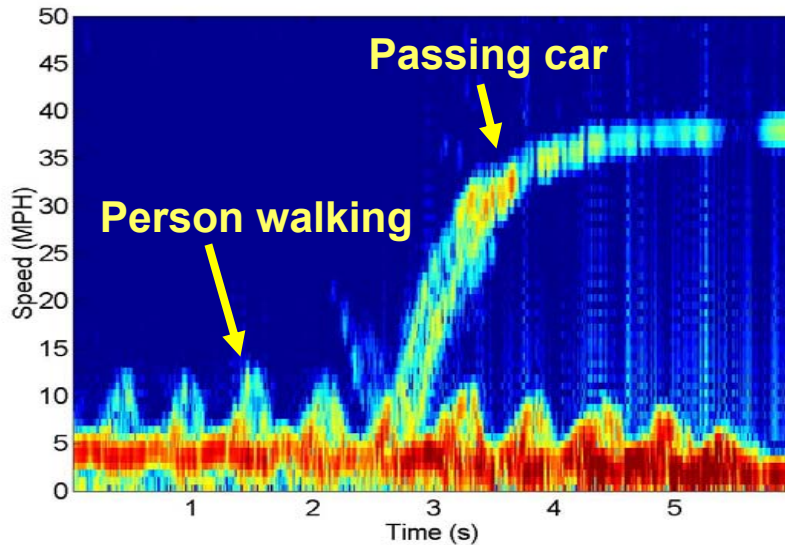
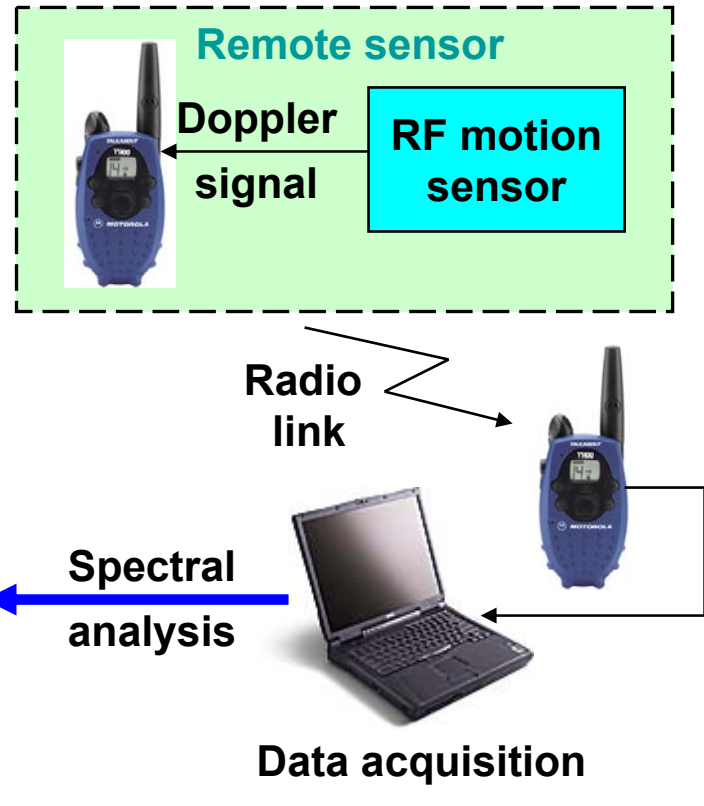
Fully correlated databases enable accurate depiction of dynamic entities in 3D virtual world



Demonstration



Experiments with low cost commercial hardware being conducted to demonstrate the performance of RF sensors for detecting and tracking moving entities.



Impacts

- **The results and “lessons learned” from MITRE’s Netted RF Sensors MSR program will have a significant impact on a number of our sponsor’s programs that are currently making use of, or planning to make use of, netted sensors**
- **Domain specific transition opportunities include**
 - **Army Future Combat Systems**
 - **Air Force Deep-Strike Mission**
 - **Navy Expeditionary Grid**
 - **DARPA MULTi-function EW System (MULES)**

Future Plans

- **Combine the sensor and data exploitation aspects of this MSR with efforts from other MITRE sponsored research programs**
 - Management of ad hoc re-configurable networks
 - Management of system resources

