Research Objective

- **Objective**: Enhance Soldiers’ decision making capability and mission performance by providing decision making criteria based on assessed trustworthiness of participating entities in tactical networks

Challenges

- Conflicting and limited understanding of trust concept in a tactical multi-genre network
- Lack of metrics quantifying trust-based mission effectiveness leading to difficulty in validation
- Lack of understanding in how to fuse multiple uncertain, conflicting evidence for decision making

ARL Facilities and Capabilities Available to Support Collaborative Research

- Trust model implementation in the CORE(Common Open Research Emulator) platform in ARL’s Network Science Research Lab

Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Expertise in network security & cognitive modeling
- Expertise in game theoretic approaches to model characteristics of and games between smart attackers and defenders

Trust-based Service Composition and Binding

- **Objective**: Investigate trust management schemes for service-oriented Mobile Ad Hoc Networks to maximize mission performance
- **Result**: Multi-trust based schemes outperforms single-trust and non-trust based counterparts

Trust-based Information and Decision Fusion

- **Objective**: Enhance Soldiers’ decision capability by providing information with high certainty
- **Result**: Trust-based fusion algorithm (TF) outperforms non-trust-based counterpart (NTF) by providing information with higher certainty

LogitTrust: A Logit Regression-based Trust Model

- **Objective**: Develop a logit regression-based trust model using observations of behavioral patterns of entities
- **Result**: LogitTrust outperforms Beta Reputation in both true positive (rate of success) and false positive (bypass) rates for decision making

Publications

- Wang, Chen, Cho, Chan and Swami, “Trust-based Service Composition and Binding for Tactical Networks with Multiple Objectives,” IEEE MILCOM 2013