Tod S. Levitt, Ph.D.

Dr. Levitt is an acknowledged leader in development of advanced capabilities for evidential reasoning in large-scale, high dimensional model analysis including operations applications in multisensor fusion, SAR, IR, and EO image understanding, ground robot vision, air to ground surveillance systems and C4ISR systems supporting multiple military intelligence, planning and command and control applications.

Dr. Levitt has led the development of a diverse family of advanced information software systems built to handle real world data under complex operating conditions. The breadth of these applications reflects his unique ability to both make theoretic advances and to transfer the resulting technology capabilities in operations and systems.

These systems include a fully automated middle-Eastern armor unit detector for the U.S. Army that was evaluated to perform at expert imagery analyst levels on wide-area, low resolution Desert Storm SAR; a system for automated diagnostic measurement from digital x-rays of the hand that was employed in clinical care at the San Francisco Veterans Administration Medical Center; a system for semi-automated 3D reconstruction of neural processes from 2D cross-sectional confocal microscope images that was used in developmental anatomy studies at Stanford University department of neurosciences; and development, patent and installation of an automated hot steel slab inspection system at U.S. Steel in Gary, Indiana.

His credentials as a chief system architect for prototype C^4ISR software systems for the Defense Advanced Research Projects Agency (DARPA) include the Advanced Digital Radar Imagery Exploitation System, the Intelligent Tactical Targeting System, the Imagery Exploitation System Balanced Technology Initiative, the Warbreaker Intelligence Correlator fusion system, the Dynamic Multiuser Information Fusion System and the Dynamic Database.

Breakthrough concepts developed by Dr. Levitt and his various teams include:

- Advances in probabilistic modeling, including Bayesian networks and spatio-temporal stochastic processes, capturing uncertainty in observation, typing, location, identity and activity
- Object-centered probabilistic models for image understanding and multi-sensor fusion
- The application of large-scale, heterogeneous decision theoretic and probabilistic reasoning to automated target recognition systems and wide area surveillance operations
- Object-oriented designs for numerous military-intelligence representations, including unit organization, activities, capability, status, support and battle damage
- Large-scale efficient constraint model representations for multi-source recognition of tactical military behaviors
- Effective techniques for knowledge acquisition of deep intelligence analysis methods from subject matter experts.

Dr. Levitt is a co-founder and 18 year member of the Board of Directors of the Association for Uncertainty in Artificial Intelligence. His Ph.D. in mathematics is from the University of Minnesota.

Selected Publications

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