

## **Douglas M. Hart**

### **WORK HISTORY:**

1999-Current: Cyberneutics, Inc. President

1980-1999: Pacific-Sierra Research Corp.

- 1986-1999: Vice President, Intelligence and Targeting Applications
- 1980-1986: Defense Analyst

1980: Carnegie Endowment for International Peace

1979-1980: U.S. Department of State, Bureau of Politico-Military Affairs

### **Education**

B.A. History, Vanderbilt University, 1978

### **Current Projects**

Collaborative Automated Planning Environment for Reconstruction and Stabilization (CAPERS): a U.S. Army Corps of Engineers STTR effort to create a trans-disciplinary approach to Reconstruction and Stabilization (R/S) operations by developing tools to support an enterprise-wide planning culture that dynamically assembles and maintains an R/S community of interest encompassing U.S. agencies, allies, international and non-governmental organizations. Cyberneutics is teamed with Georgetown University on this STTR.

Conflict Modeling, Planning, and Outcome Experimentation (COMPOEX): a DARPA program that is developing automated tools to assist the commander and staff in generating, assessing and understanding the consequences of political, military, economic, social, information operations, and infrastructure (PMESII) effects, and constructing and evaluating plans that are based on the impact of multi-dimensional effects and the interaction among effects. Cyberneutics software will apply over the full continuum of near-simultaneous missions required in a campaign, to include major combat operations and various security, stability and reconstruction operations.

Geopolitical Analysis and Modeling Environment (GAME): developing methodologies and software tools to support force structure analysts at the U.S. Navy's Dahlgren Surface Warfare Center in predicting regional political, economic, and military trends. A key aspect of GAME is the development and automation of methodologies for assessing trends associated with the emergence and maturation of asymmetric threats in regions of importance to U.S. national security.

Scalable Template Architecture for Network Data Sharing (STANDS): an Air Force Research Laboratory project to develop a human-computer division of labor that combines network hardware, application software, and warfighter tactics, techniques and procedures for minimizing information latency while safeguarding operational and intelligence information from unauthorized disclosure. On the information technology side, STANDS is a template-based architecture for sharing just enough data, but no more, between diverse coalition members in a time dominant environment. This template supports plug and play integration of COTS and GOTS network and security functionality and scales to encompass separate, simultaneous communities of interest across common network transport where the owner of the information retains access control. On the human process side, STANDS concepts of operations and their

component TTPs are emergent phenomena, rather than restrictive and inefficient planning artifacts developed for specific missions and then modified haphazardly in time of crisis to suit particular circumstances.

Coalition Shared Intelligence Network Environment (COSINE): participating in an Advanced Concept Technology Demonstration led by the NATO Consultation, Command and Control Agency. COSINE's goal is to enable coalition intelligence analysts to work within their collective security domains for protection and assurance but still share intelligence products with users in other security domains. Cyberneutics is developing scenarios and use cases that enable coalition interconnection, dynamic information security, cross-coalition information sharing and discovery, collaboration and shared production, and CONOPS and TTPs for building an integrated intelligence picture amongst coalition members.

Collaboration and Analyst/System Effectiveness (CASE): a multi-year project sponsored by the Intelligence Community to develop cognitive aids that help temporary teams of analysts and decision makers rapidly and fully comprehend complicated and uncertain situations by creating dynamic, adaptable, peer-to-peer collaborative networks. Cyberneutics is supplying scenarios, use cases, and functionality requirements to the CASE design and development process. We are also involved in implementing, testing, and validating advanced data discovery, information sharing and collaboration functionality for multi-agency networks.

Bandwidth Agile Sensor Swarm (BASS): supporting the development of Bayesian computational inference techniques to 1) perform distributed, autonomous, and incremental situation assessment and 2) enable robotic swarm intelligence to achieve locationally flexible collaboration amongst the U.S. Navy's Expeditionary Sensor Grid elements based on diverse and evolving target behavior. Target behavior analysis includes asymmetric littoral battlespace threats to U.S. naval forces.

## **EXPERIENCE**

### **Domain Expertise**

- Modeling religious sectarian terrorist organizations
- Indications and warning of cyber-terrorist attack
- Use of the Internet by terrorist organizations to acquire WMD
- Interaction of terrorist and transnational criminal networks
- Networkcentric warfare: swarming doctrine and operational concepts
- Mobile surface-to-surface missiles
- Intelligence preparation of the battlespace: conventional and asymmetric

### **Concept Development**

#### **U.S. Navy**

- Netcentric warfare: Participated in planning and execution Fleet Battle Experiments Delta, Echo, Foxtrot, Golf, and Hotel.
- Littoral warfare/land attack doctrine: Supported clients with operational concepts development on DD-21 Gold Team Land Attack Warfare Group, Naval Surface Fires Support Program, Common Land Attack Warfare System, Tactical Tomahawk Weapons Control System.

**Defense Advanced Research Projects Agency**

- Tactical Use of National Technical Means Program: Warning and targeting applications of national, theater and tactical data fusion for USEUCOM; sites included USAREUR DCSINT, Field Station Augsburg, Field Station Berlin, 66<sup>th</sup> MI Brigade
- War Breaker Program: Decision support tools for time critical targeting for U.S. Army and Air Force; sites included JAC Molesworth, USAF Air Combat Command, 66<sup>th</sup> MI Brigade
- Distributed Multi-User Intelligence Fusion Program: Distributed intelligence data fusion testbed and transition environment for U.S. Army ASAS PMO and U.S. Air Force TBM Core Systems PMO
- Dynamic Data Base Program: Next generation DII COE-compliant data warehousing and fusion system for insertion into GCCS and Service migration systems
- Information Assurance/Information Protection: Supported clients in the areas of Information Assurance Science and Engineering Tools, Autonomic Information Assurance, Cyber Command and Control, and Information Assurance Across Dynamic Coalitions

**Office of the Deputy Undersecretary of Defense (Advanced Technology) Advanced Concept Technology Demonstrations**

- Joint Continuous Strike Environment: Decision support toolkit for rapid target prosecution; participants include U.S. Air Force Europe, U.S. Army Europe, and 6<sup>th</sup> Fleet
- Coalition C4I Interoperability: Automated interoperability for heterogeneous databases; participants include French Army, German Army, British Army, Italian Army, Canadian Army, US Army
- Force Protection against Asymmetric Threats: Developed concept and execution plan for web-enabled counter-intelligence/human intelligence databases for force protection missions in US EUCOM utilizing Defense Intelligence Agency's Modernized Defense Intelligence Threat Dissemination System infrastructure
- Human Intelligence Support Tools: developed concept and execution plan for sensors, databases, data mining/discovery, and archived text processing technology for the Defense HUMINT Service, Defense Intelligence Agency, and the U.S. Special Operations Command for planning and managing HUMINT missions against asymmetric threats
- Coalition Aerial Surveillance and Reconnaissance (CAESAR): Common data formats and advanced moving target indicator (MTI) processing algorithms for U.S., French, Italian, UK, and NATO MTI platforms and ground stations

**Functional Support for Operations**

- C4ISR: generated requirements and supported development, installation, and training for advanced information technology applications throughout the processing, exploitation, and dissemination path for U.S. military and intelligence community customers in CONUS and deployed locations.

- Joint and coalition fire support: in-depth familiarity with automated fire support technology in US EUCOM and US Forces Command Korea and those of key allies in both theaters.
- Exercise participation and support: Led multi-contractor teams in operational test and evaluation in such venues as Rapid Targeting Capability Europe; Roving Sands, Ulchi Focus Lens; CINC TMD Experiments; Fleet Battle Experiments; DD-21 Gold Team Wargames; and periodic exercises of the Quadrilateral Armies Communications & Information Systems Interoperability Group (U.S. U.K., France, and Germany)

#### Analytical

- 1985-1997: Led major studies on internet-based warning of nuclear, chemical, and biological proliferation and cyberattack; military space; information warfare; transnational crime and asymmetric threats; the revolution in military affairs; mobile ballistic and cruise missiles, mobile targeting; nuclear logistics. Author of The Encyclopedia of Soviet Spacecraft, Bison Books: London, 1987.
- 1998: “Utilizing Information Artifacts for WMD Network Detection”, study conducted for the Office of the Deputy Undersecretary of Defense (Advanced Technology). Derived internet-based warning of nuclear, chemical, and biological proliferation by terrorist organizations. Results were validated with a case study approach utilizing Internet artifacts generated by the Aum Shinrikyo cult in pursuit of WMD capability.
- 2001-3: Supported the development of General Dynamics’ Critical Intent Modeler (CIM) under the DARPA Information Awareness Office’s Genoa II Program, which is an application for representing and analyzing problems, monitoring observables, and assessing options or courses of actions within the context of counterterrorism and other asymmetric threat operations. Also developed a series of usage scenarios for Genoa II applications based on historical case studies. Co-authored the Terrorist Information Awareness Program Concept of Operations, and an analysis of analytical and decision support tools employed by the Counterintelligence Field Activity against terrorist operations in the U.S. and abroad.
- 2004: DARPA Tactical Technology Office (TTO): providing programmatic support and subject matter expertise to the TTO unmanned systems thrust, to include the employment of swarm intelligence as a robotic control paradigm for unmanned boats operating against asymmetric naval threats in littoral waters. Designed a command and control schema for the Unmanned Combat Armed Rotorcraft (UCAR) based on pack hunting top-predator behavior.
- 2005: Department of Justice: Key participant in a National Institute of Justice sponsored study to investigate the nexus between international terrorist organizations and transnational crime. The study is applying intelligence preparation of the battlespace techniques to the detection, monitoring, and pre-emption of the formation of terrorist/criminal networks for financing, operations support and execution, acquisition of weapons of mass destruction, etc. Detailed indicators of convergence between transnational crime and international terror will be developed and applicable automated support tools investigated.

### **Program Management**

Assembled and led a team of military specialists, software engineers, and applied mathematicians in developing the following large and complex data correlation and fusion systems from requirements generation through testing, installation, training, and transition to operational environments in CONUS and USEUCOM:

- Automated indications and warning: decision analysis tool set vertically integrated with semi-automated database generation functionality supporting normalcy determination, trend analysis, what if excursions, model-based alert generation, and a multi-media storage and display capability
- Automated intelligence preparation of the battlespace: a massively parallel implementation combining relational force and equipment data, digital geospatial data, doctrinal behavior and movement models, and a Markov-Bayes tracking engine to support prosecution of time critical targets
- Image understanding systems that perform semi-automated detection, classification, and identification of military vehicles and equipment and automated generation of digital terrain and feature data from multi-spectral imagery

Major elements of these systems have been transitioned into the U.S. Army's All-Source Analysis System and the U.S. Air Force's TBM Core Systems. The terrain analysis software became the first DARPA module to be successfully segmented in the DII COE in 1999.

### **Business development**

- Key contributor to achieving 20% annual corporate growth at PSR despite declining defense budgets
- Responsible for 25% of gross sales at PSR over a ten-year period
- Responsible for the 3 of the 4 largest procurements in PSR history
- Led strategic planning process for ¾ of PSR's business base from 1995 to 1999

Supplied expertise since forming Cyberneutics in February 1999 resulting in over \$50 M in sales for clients to date in the following programs:

- Naval Fires Control System: ACAT 3-level automated land attack system.
- Automated Deep Operations Coordination System: Army and Joint fires automated support tools deployed world wide
- Multiple Unified Simulation Environment: multi-Service sensor visualization, planning and control software used in exercises and experiments throughout the world
- Project Hercules: applications of Bayesian belief networks to real-time clutter reduction and target discrimination
- Broad Area Announcements and Small Business Innovative Research awards in the areas computational inference, sensor processing, and distance learning

Mergers and Acquisitions: Key contributor to the acquisition of Pacific-Sierra Research by Eaton Corp. in 1987, leveraged management buyout of PSR from Eaton in 1992, acquisition of PSR by Veridian Corp. in 1998, and Interactive Television Company by General Dynamics in 2000.

**Publications**

Published 24 national and international journal and newspaper articles on U.S. Defense and Foreign policy. Recent publications include:

Hart, Douglas and Steven Simon, "Thinking Straight and Talking Straight: Problems of Intelligence Analysis", *Survival*, International Institute for Strategic Studies, Vol. 48 no. 1, Spring 2006, pp. 35-60.

Hart, Douglas and Patricia A. Craig-Hart, "Methods and Motives: Exploring Links Between Transnational Organized Crime and International Terrorism", U.S. Department of Justice, Document 211207, June 2005

Hart, Douglas and Patricia A. Craig-Hart, "Reducing Swarming Theory to Practice for UAV Control", *2004 IEEE Aerospace Conference Proceedings*, May 2004.

Hart, Douglas and Dennis Gormley, "Extending Network Centric Warfare to Coalition Crisis Assessment and Management", *RUSI Journal*, Vol. 145, No. 2, April 2000.

**CONTACT INFORMATION**

Douglas M. Hart  
Cyberneutics, Inc.  
4201 Wilson Blvd., #110-287  
Arlington, VA 22203  
540-242-3386 (Voicemail/Fax)  
Email: [dmhart@cyberneutics.com](mailto:dmhart@cyberneutics.com)  
Website: <http://www.cyberneutics.com>