

# Information Exploitation Research



Disruptive Technology Office



*Riding the information tsunami*

## Division Overview

For years the Intelligence Community has rightly prided itself on collecting **large amounts** of high-quality information. As the digital age matures, however, this capacity is becoming an embarrassment of riches as analysts find it increasingly difficult to keep up with the ever-expanding sea of information. The Information Exploitation Research Division (InfoX) sponsors **advanced research** in tools and techniques designed to **radically change** and **improve** the practice of **intelligence analysis**. InfoX works with top researchers to **advance the possible**, with real analysts to **serve the users**, and with legal oversight to **protect the civil liberties** of Americans.

InfoX comprises a range of research activities. The **Advanced Question Answering for Intelligence (AQUAINT)** program seeks to use improved machine understanding of human language to help analysts more accurately find relevant information in textual and audio formats. The **Video Analysis and Content Extraction (VACE)** program complements this by helping analysts digest the huge amounts of video and other imagery available by building hierarchical representations from object recognition to modeling of events. The **Collaboration and Analyst / System**

**Effectiveness (CASE)** program focuses on the human aspect of analysis, in particular deep understanding of the analytic process and how analysts work together despite institutional, technological, and cultural barriers. The **Tangram** program



integrates and scales data characterization tools to produce a fully automated, continuously operating counter terrorism surveillance and warning system. The **ProActive Intelligence (PAINT)** program uses modeling and simulation to allow analysts to quickly play out possible futures and help decision-makers choose the best course of action. Finally, the **ASpace-X** program is developing immersive, game-based environments to radically change how analysts interact with information and each other.

All InfoX research is guided by frequent evaluations with concrete metrics. InfoX programs sponsor external open evaluations such as TREC and TREC-VID at NIST, as well as program-



Dr. Rita Bush, Division Chief  
[rbush@cas1.umd.edu](mailto:rbush@cas1.umd.edu)

Dr. Paul Kingbury, Senior Technical Advisor  
[dto.paul.k@gmail.com](mailto:dto.paul.k@gmail.com)

specific evaluations of the utility and usefulness of sponsored tools. InfoX makes extensive use of DTO's Research & Development Experimental Collaboration (RDEC) network to demonstrate the functionality of sponsored tools in realistic



environments, and InfoX has an excellent record of transitioning technologies to operational use. Examples include Oculus' **GeoTime**<sup>®</sup>, General Dynamics' **tag|Connect**, Least Squares' **Policrash**, Sarnoff's **TerraSight**<sup>™</sup>, Language Computer Corp's **Ferret** question-answering system, and the **Hydra** multi-party integrated analysis platform.

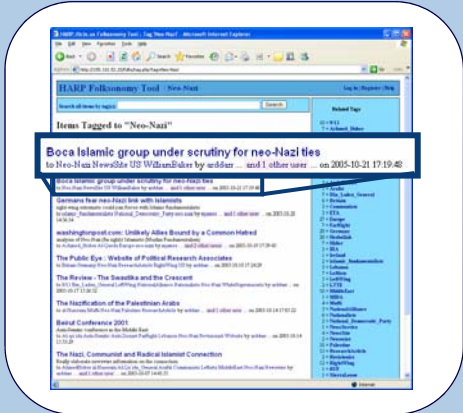


## Sample Projects

General Dynamics' **tag|Connect** uses the Web 2.0 philosophy of tagging documents with user-defined labels ("folksonomies") to allow analysts to implicitly collaborate to organize the vast amounts of available information. Users can tag the documents they've

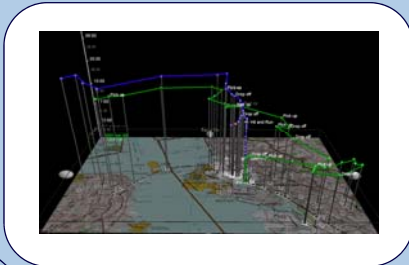
need for multiple separate tools for analysis. It uses a single interactive three-dimensional view to show links and relationships between objects and events. It has been deployed into operational use at the Defense Intelligence Agency and the National Geospatial-Intelligence Agency, and is being modified to handle networks that are not necessarily geospatial in nature.

Carnegie Mellon University's **InforMedia** is a sophisticated tool for querying large corpora of

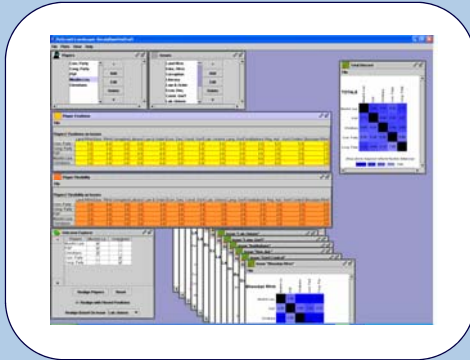


discovered and found to be useful with labels of their own choosing for their own data organization. Users are also able to see the documents and tags of other users, allowing them to explore alternative viewpoints and discover documents they would not have known to ask for other-wise. tag|Connect is deployed as a core service on Intelink, making it available to over 150,000 users.

Oculus' **GeoTime**® is a data visualization tool for time and geography, intended to replace the



Least Squares Software's **Landscape:Decision** is a powerful modeling tool for complex social systems. It allows users to identify key players or factions in a social situation as well as the issues of key importance to those players. This identification then allows groups of users to analyze the situation from the same set of assumptions. Policrash also contains sophisticated statistical modeling algorithms that can automatically explore the space of players and issues in order to predict likely and possible cooperation and influence points. Landscape:Decision has been deployed at the Central Intelligence Agency and has been used



to gain insight into issues of strategic international importance.



broadcast news footage for key objects or events. It operates both by recognizing objects in the video stream as well as by understanding the language on the audio track. It works on news in English, Chinese, and Arabic and allows a user to quickly focus on precisely the passages containing the desired information without having to manually filter through hours of irrelevant footage. InforMedia is a joint product of the VACE and AQUAINT programs and is slated for deployment at the Defense Intelligence Agency, National Geospatial-Intelligence Agency, National Security Agency, and the Open Source Center.



See us on Intellipedia:  
[www.ic.gov/wiki/DTO](http://www.ic.gov/wiki/DTO)