

Topic: N132-131

## Boston Fusion Corp.

### Multi-Level Associative Content Environment (MACE)

MACE, developed by Boston Fusion, is a multi-layer graph database that automatically analyzes associations among entities and provides visualization tools to discover and explore latent connections that are otherwise hard to identify in large collections of entity-relationship data from multiple sources, including audio, video, and text. MACE provides a fundamental capability that supports a broad range of mission areas, including the scientific and technical intelligence (S&TI) mission of the Office of Naval Intelligence Farragut Technical Analysis Center. It has been evaluated using the University of Maryland Global Terrorism Database, in which it successfully identified latent relationships among terrorist groups that had not previously been detected. We have identified the FNT-FY12-02 Autonomous Persistent Tactical Surveillance, DCGS-N ACAT IAM acquisition program as a transition target for MACE.

### Technology Category Alignment:

Human/Autonomous System Interaction and Collaboration

Human Computer Interfaces (HCI) for Decision Making

Synthesis/Analytics/Decision Tools

Information Collection/Management

Human Aspects of Operations in Military Environments

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**SYSCOM:** ONR

**Contract:** N00014-15-C-0018

# Department of the Navy SBIR/STTR Transition Program

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## WHO

**SYSCOM:** ONR

**Sponsoring Program:** Code 31

**Transition Target:** Autonomous Persistent Tactical Surveillance Distributed Common Ground System-Navy (DCGS-N)

**TPOC:**

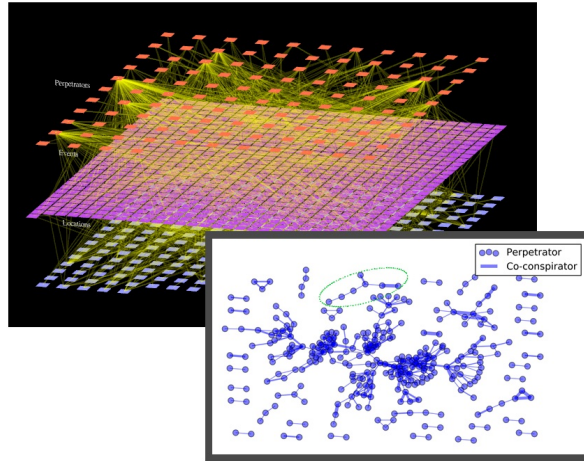
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**Other transition opportunities:**  
Office of Naval Intelligence (ONI)  
National Counterterrorism Center (NCTC)

U.S. Immigration and Customs Enforcement (ICE)

National Air and Space Intelligence Center (NASIC)



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## WHAT

**Operational Need and Improvement:** Analysts developing actionable intelligence must process data from an ever expanding array of sensors and information sources. To address this big data challenge, technologies must be developed to reduce the time required to formulate appropriate responses in rapidly evolving missions, such as enemy force reconnaissance and counter-terrorism operations. Associative database techniques provide analysts with high performance discovery tools for rapid entity and evidence extraction, relationship discovery, and semantic analysis. In environments where extremely large-scale datasets exist, the need for associating relevant data to relationships in a dynamic mission environment is ever more critical and challenging.

**Specifications Required:** This effort will result in an associative database capability based upon both state-of-the-art technologies and new capabilities that can be integrated in innovative ways to deliver analytic insights more quickly across very large datasets.

**Technology Developed:** Boston Fusion has developed MACE (Multi-Level Associative Content Environment), a graph database that enables massive data search and the automated analysis of probabilistic associations between entities, sources, and concepts at multiple levels of detail. MACE incorporates visualization tools to enable the warfighter to discover latent relationships and evidential insights that are otherwise impossible to find in very large datasets.

**Warfighter Value:** MACE is a graph database that enables massive data search and the automated analysis of probabilistic associations between entities, sources, and concepts at multiple levels of detail. It incorporates visualization tools to enable the warfighter to discover latent relationships and evidential insights that are hard to find in missions that require the analysis of very large collections of objects and events.

## WHEN

**Contract Number:** N00014-15-C-0018 **Ending on:** March 1, 2018

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Latent relationship discovery capability	N/A	Detection of latent relationships in test data	TRL 4	January 2017
Change detection capability in multi-layer graphs	Med	Detection of changes in multi-layer graph test data	TRL 4	October 2017
2D & 3D multi-layer graph visualization capability	Med	Improved user visualization and analysis multi-layer graph data	TRL 4	October 2017
Test & Evaluation on Global Terrorism Database (GTD)	Med	Successful detection of latent relationships and significant changes in GTD	TRL 6	November 2017
DCGS-N data analytics improvements	High	Successful detection of latent relationships and significant changes in DCGS-N exercise	TRL 7	March 2020

## HOW

**Projected Business Model:** Boston Fusion Corp. plans to license MACE technology for use in both DoD and commercial data analytics platforms. We are open to selling the IP rights to a large prime for integration into a larger-scale product offering.

**Company Objectives:** Boston Fusion Corp. specializes in the development of advanced machine learning and data fusion technology. Our near-term objective is building relationships with potential transition partners and demonstrating the capabilities of MACE in customer-specific pilot studies.

**Potential Commercial Applications:** MACE has broad applications for knowledge management and relationship extraction in both government and private sectors. In government it has numerous applications in the DoD, the intelligence community, law-enforcement, homeland security, and state and local governments to deal with asymmetric threats, deployment of first responders, crisis management planning, and humanitarian aid response.

The technology is equally compelling in commercial sector applications as it provides an environment to rapidly infer relationships and connect the right consumers to appropriate suppliers for wide-ranging services. In essence the associative database system enables rapid understanding of highly complex events and situations by "connecting the dots" in an environment that involves high data volume and quick response.

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