### WHO

**SYSCOM:** ORR  
**Sponsoring Program:** Code 31  
**Transition Target:** Autonomous Persistent Tactical Surveillance  
**Distributed Common Ground System-Navy (DCGS-N)**  
**TPOC:**  
Allen Moshfegh  
allen.moshfegh@navy.mil  
**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 (NASIG)

### 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

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

### 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.

**Contact:** Dr. Carl Weir, Project Manager  
carl.weir@bostonfusion.com  
610-517-0213