

SBIR Topic Number:
AF05-104

SBIR Title:
Expert Intelligent Match
of Requirements and
Solutions

Contract Number:
FA8750-06-C-0042

SBIR Company Name:
Stottler Henke Associates,
Inc., San Mateo, CA

Technical Project Office:
AFRL Information
Directorate, Rome, NY

This Air Force SBIR/STTR Innovation Story is an example of Air Force supported SBIR/STTR technology that met topic requirements and has outstanding potential for Air Force and DoD.

The collaborative interface at Future-Fusion.com for collecting predictive judgments

Predictive Model for Evaluating Future Scenarios

- The Air Force needs expanded information analysis capabilities, particularly in the areas of behavioral modeling, threat modeling, and threat prediction
- FutureFusion™, Stottler Henke’s web-based collaborative modeling system, builds predictive awareness and enables analysts to visualize paths to possible futures and formulate predictions on the ultimate outcome of scenarios of interest
- This modeling technology captures both popular consensus as well as high-risk outliers, thereby reducing the potential for surprise
- FutureFusion can benefit military and commercial users by providing early warning and analysis capabilities

Air Force Requirement

The Joint Directors of Laboratories (JDL) Subpanel on Data Fusion has defined Data Fusion as “a process dealing with the association, correlation, and combination of data and information from single and multiple sources to achieve refined position and identity estimates, and complete and timely assessments of situations and threats, and their significance. The process is characterized by continuous refinements of its estimates and assessments, and the evaluation of the need for additional sources, or modification of the process itself, to achieve improved results.”

To date, the majority of data fusion research, development, and applications focus primarily on the lowest levels of data fusion (e.g., Level 1 – Object Refinement). The higher levels of information fusion, referred to as Fusion 2+, are inadequately being addressed, particularly in the areas of Behavioral Modeling, Threat Modeling, and Threat Prediction.

SBIR Technology

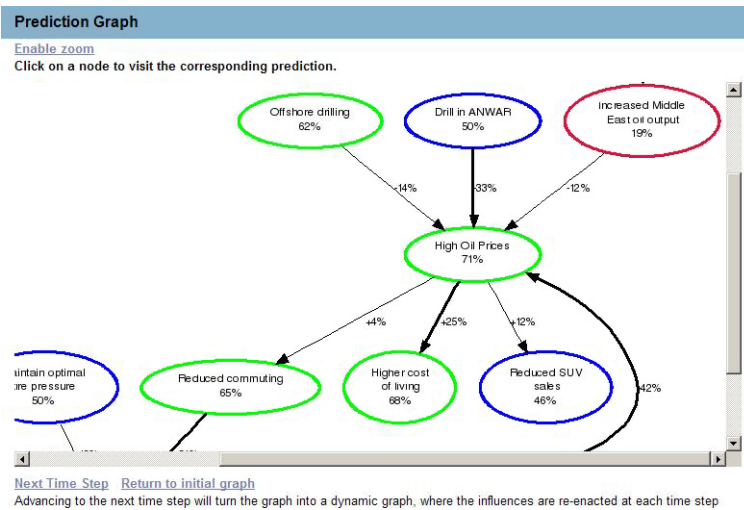
This SBIR-developed technology supports predictive situation awareness in a way that leverages human insight to enhance the forecasting abilities of Fusion levels 2 and 3. Existent technologies fail to support predictive and impact modeling under realistic conditions, particularly when there are few historic exemplars on which to base inferences or when full awareness of the situation includes unobservable elements.

FutureFusion™, Stottler Henke’s web-based collaborative modeling system, builds predictive awareness and enables analysts to visualize paths to possible futures and formulate predictions on the ultimate outcome of scenarios of interest. FutureFusion’s human interpretable knowledge representation is unique in its ability to capture qualitative descriptions of possible futures and quantify them to build computational models.

Further, FutureFusion captures both popular consensus as well as high-risk outliers, thereby reducing the potential for surprise. By efficiently diversifying the modeling process across a heterogeneous and distributed community of experts, this method avoids the common pitfalls of more traditional modeling approaches. FutureFusion helps to cast light on blind spots, mitigate human biases, and maintain a holistic, up-to-date predictive and impact awareness.

Potential Air Force Application

FutureFusion diversifies and expands the network of information sources in order to capture a greater perspective on a situation. This technology, for instance, has significant potential to buttress the current human-driven Indications & Warning processes as it supports synchronous and asynchronous collaboration (without the need for a facilitator) in a way that encourages the continuous revision of predictive models as events occur and new insights arise. Such “living” models offer obvious advantages over the static models that typically result from the more costly war-room style modeling approaches.



A prediction graph at Future-Fusion.com

Another military application is in the area of Effects Based Operations where the creation and adaptation of predictive models is critical. FutureFusion can also provide corporations with an early warning capability that allows them to monitor their competitors and the markets for changes that may signal impending threats.

Company Impact

This SBIR project has allowed Stottler Henke to launch a web-based tool (www.future-fusion.com) with significant military and commercial market potential. Stottler Henke is currently working to apply this technology in new areas, including Stability and Support Operations.

Founded in 1988, Stottler Henke applies artificial intelligence and other advanced software technologies to solve problems that defy solution using traditional approaches.



SBIR/STTR

Air Force SBIR Program
AFRL/XP
1864 4th Street
Wright-Patterson AFB OH 45433

AF SBIR/STTR Program Manager: Augustine Vu
Website: www.sbirstttrmail.com
Comm: (800) 222-0336
Fax: (937) 255-2219
e-mail: afrm.xppn.dl.sbir.hq@wpafb.af.mil

