

Transition

SBIR Topic Number:
AF06-065

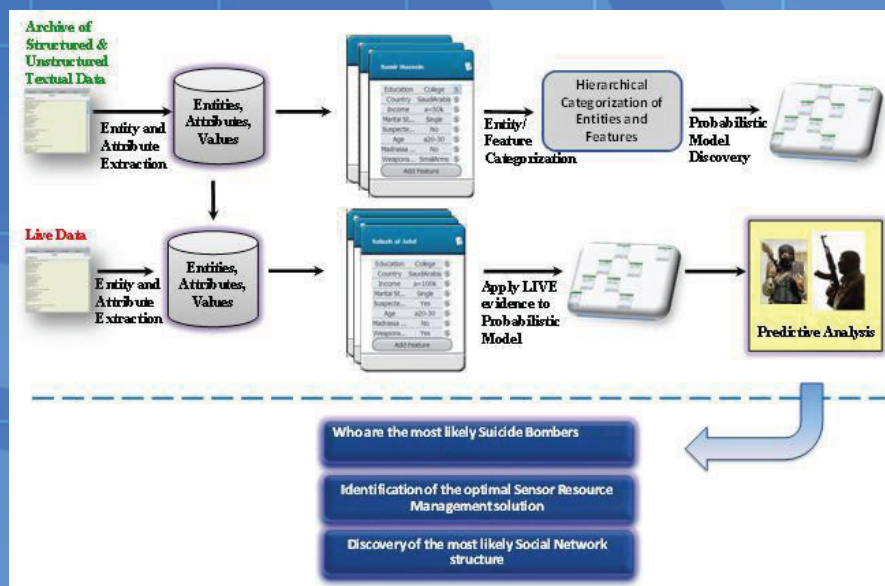
SBIR Title:
Acquiring Probabilistic Knowledge for Information Fusion

Contract Number:
FA8750-07-C-0055

SBIR Company Name:
DECISIVE ANALYTICS Corporation,
Arlington, VA

Technical Project Office:
AFRL Information Directorate,
Rome, NY

An example of Air Force supported SBIR/STTR technology that has been transitioned into an Air Force or other DoD system or subsystem or used by Air Force test ranges and facilities or maintenance depots.



Three Step Process – Data Discovery, Model Generation, Predictive Analysis

Acquiring Probabilistic Knowledge for Information Fusion

- Predictive analytics is becoming a critical component in a wide variety of military and civilian applications
- DECISIVE ANALYTICS Corporation (DAC) developed the Predictive Analysis Network Tool for Human knowledge Elicitation and Reasoning (PANTHER) to support learning, analysis, and sharing of probabilistic knowledge in the form of predictive models
- PANTHER applies “live” data to the developed model allowing commanders, subject matter experts, and analysts to validate hypotheses, predict future behavior, and examine “what if” scenarios
- PANTHER is being transitioned to the U.S. Army Intelligence and Security Command (INSCOM) as part of its computing environment and the U.S. Army Intelligence Center of Excellence (USAICoE) as part of its USAIC Tube system

Commercialization Pilot Program Series

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Air Force Requirement

Predictive analytics is becoming a critical component in a wide variety of military and civilian applications. From intelligence analysis to business analytics, the use of modeling techniques such as Bayesian Networks has evolved into an integral part of today's knowledge systems. The development of these models has historically relied upon the pairing of Subject Matter Experts (SMEs) and Probabilistic Modeling Experts. Unfortunately, this method of model development required significant time and expertise and often results in models based on the SMEs' own biases. Due to these constraints, the developed models are often out-of-date, inaccurate, and/or no longer relevant by the time they are constructed.

SBIR Technology

Under this SBIR project, DECISIVE ANALYTICS Corporation (DAC) developed the Predictive Analysis Network Tool for Human knowledge Elicitation and Reasoning (PANTHER) to support learning, analysis, and sharing of probabilistic knowledge in the form of predictive models. PANTHER provides a stream-lined approach to model development that accomplishes its goals in the following ways:

- Reduction in the model development time from months to hours by providing SMEs candidate predictive models based on historic data
- Removal of the need for Probabilistic Modeling Experts by providing automated model generation algorithms
- Minimization of the likelihood of SME biases appearing in the models by providing contrary evidence

PANTHER applies "live" data to the developed model allowing commanders, SMEs, and analysts to validate hypotheses, predict future behavior, and examine "what if" scenarios. The models' predictions and analysis are automatically updated to accommodate new data as it arrives, providing the warfighter with timely understanding of the battlespace and probabilities of future events. The results of the Predictive Analysis phase can be considered the deliverable of the entire analysis process.

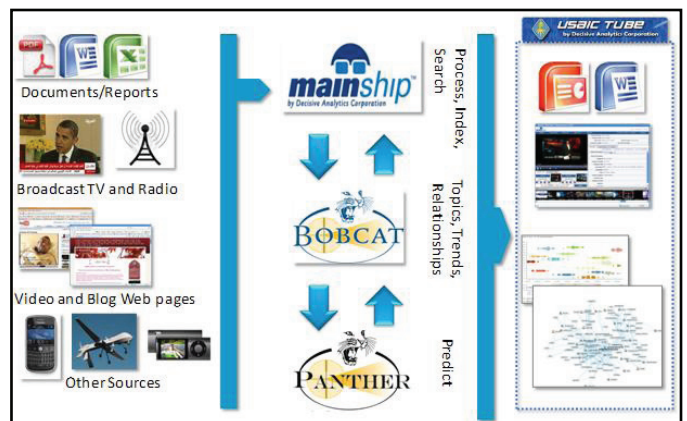
A key feature of the solution is that the application is completely agnostic to the domain of the data and the type of analysis being requested. Examples of the potential models that could be developed by the proposed solution include:

- Discovery of the most likely suicide bombers residing within a certain area based on intelligence reports, census data, and weblogs

- Determination of the lead salary indicators for specific jobs within an organization
- Identification of the best leader and team for successful job completion
- Identification of locations most likely to be used as escape routes by fugitives based on terrain data, local alliances, and other reports

Transition Impact

PANTHER is being transitioned to the U.S. Army Intelligence and Security Command (INSCOM) as part of its computing environment and the U.S. Army Intelligence Center of Excellence (USAICoE) as part of its USAIC Tube system. INSCOM will be using PANTHER to identify key indicators of terrorism from structured and unstructured data. USAIC Tube integrates PANTHER with DAC's Mainship (media asset management) and Bobcat (topic discovery) tools. This provides USAIC the capability to collect, translate, process, index and analyze very large amounts of broadcast video and unstructured web data.



Company Impact

"DECISIVE ANALYTICS Corporation has benefited significantly from its participation in the SBIR program," observes Dr. James Nolan, Vice President, Products and Innovation. "There is a considerable market demand for the PANTHER technology. The PANTHER capability provides an additional revenue stream through subscription sales on the hosted website or through system installations for those who desire the capability for use in organizational firewalls. Further, DAC is incorporating this predictive capability into our Contour product (contour.dac.us) for use in defense and commercial applications."



SBIR/STTR

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