

S&T Stakeholders Conference

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Mission and Goals of the Human Factors Division

Social-Behavioral Threat Analysis Thrust Area

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From Science and Technology... Security and Trust



Homeland Security



Human Factors Division (HFD)

Mission Statement

To apply the social and behavioral sciences to improve detection, analysis, and understanding of the threats posed by individuals, groups, and radical movements; to support the preparedness, response, and recovery of communities impacted by catastrophic events; and to advance national security by integrating human factors into homeland security technologies.

Know our enemies, understand ourselves; put the human in the equation.

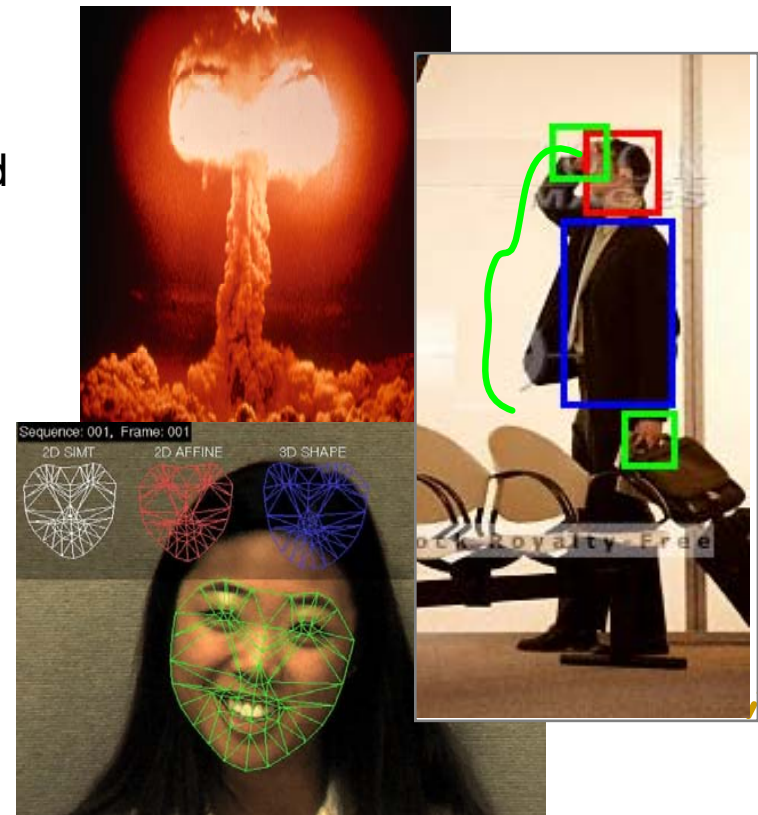


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HFD Thrust Areas

The DHS S&T Human Factors Division is comprised of two primary thrust areas, with programs under each:

- **Social-Behavioral Threat Analysis**
 - Motivation and Intent
 - Suspicious Behavior Detection
 - Community Preparedness, Response, and Recovery
- **Human-System Research & Engineering**
 - Personal Identification Systems
 - Technology Acceptance and Integration
 - Technology-Human Integration



Social-Behavioral Threat Analysis (SBTA) Thrust Area's Missions

- To apply the social and behavioral sciences to improve detection, analysis, and understanding of the threats posed by individuals, groups, and radical movements; and,
- To support the preparedness, response, and recovery of communities impacted by catastrophic events.



SBTA Goals

- Enhance the analytical capabilities of the Department to understand terrorist motivation, intent, and behavior
- Improve screening by providing a science-based capability to identify deceptive and suspicious behavior
- Mitigate impacts of catastrophic events by delivering capabilities that incorporate social, psychological, and economic aspects of community preparedness, response, and recovery

SBTA Program Areas: Motivation and Intent

Investing in research to develop:

- Understanding of radicalization processes and effective interventions;
- Computational models and analytical tools; and
- Understanding of terrorist ideology and terrorist behavior, such as recruitment, target selection, and deterrents.

Types Research Questions:

What causes one group to use violence while others chose not to?

What factors contribute to the radicalization of a group?

Are there new modeling techniques which might improve prediction?

Under what circumstances would a person turn to terrorism?



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SBTA Program Areas: Suspicious Behavior Detection

Investing in research to:

- Identify behavioral indicators of deception and hostile intent;
- Develop non-invasive sensor algorithms to detect in real-time these behavioral indicators; and
- Develop a prototype to detect deception and hostile intent in real-time using non-invasive, culturally independent sensors algorithms.

Types Research Questions:

What behaviors are indicators of deception and hostile intent?

Which of these indicators are present in a interactive environment?

Which of these indicators are present in an observational environment?

Which of these indicators are culturally independent?

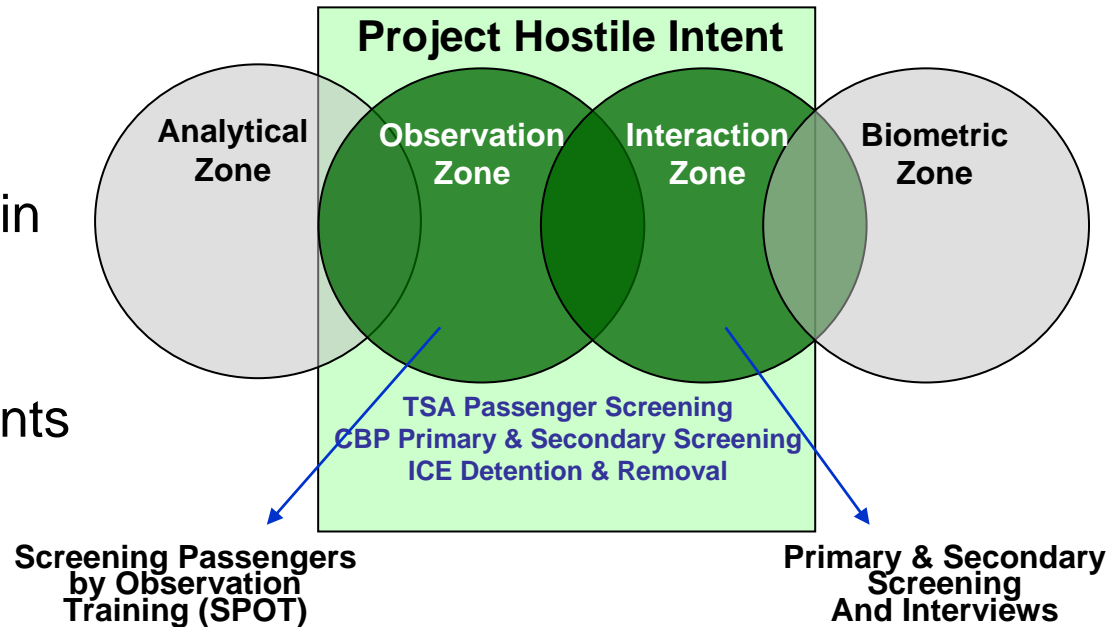


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Suspicious Behavior Detection Overview

Program Objective

- Identify suspicious behavior, hostile intent, and deception in real time, using non-invasive sensors
- Directly supports and augments real-time screening & interviewing



Deliverables

- Culturally independent indicators of future hostile intent
 - Drives training and real-time intent detection prototype
- Training simulation to increase screener's intent detection skills
- Real-time, non-invasive, prototype to detect hostile intent

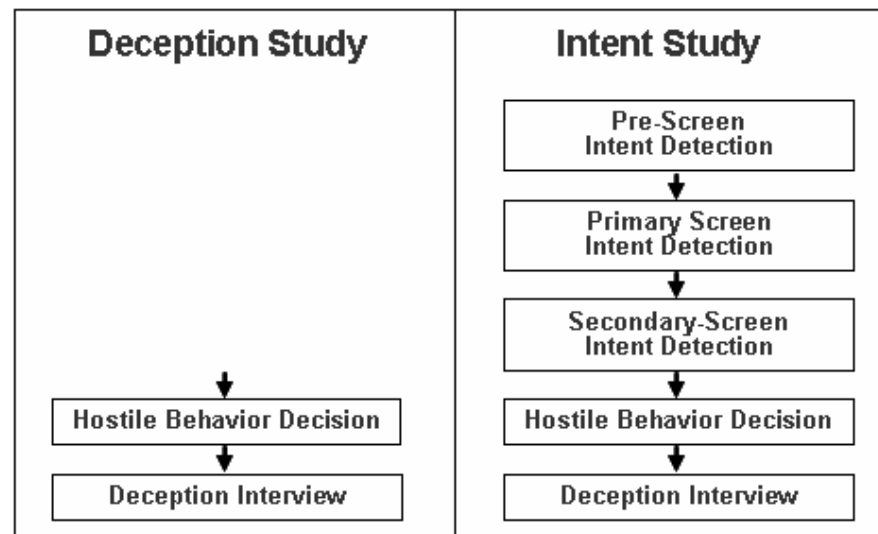


Behavioral Indicators & Sensors



- Objective: Derive and validate behavioral indicators
- Approach: Experimentally replicate DHS operational environment
 - Involuntary & voluntary behaviors; cross-cultural; question-level; resistant to counter-measures
- Validation Plan: Iterative laboratory and operational testing

Deception & Intent Paradigm



Interim Results: 86% classification accuracy in the laboratory

Goals for Tomorrow

Revolutionary Integration of Screening Methods

- Behavior based screening
- Increase screening speed
- Fusion of Multiple Inputs
- Assist on site evaluators

Automating Observations

- Remove subjectivity from the process
- Behavior indicated by movement/action
- Minimize divestment (i.e. coat, shoes, etc)

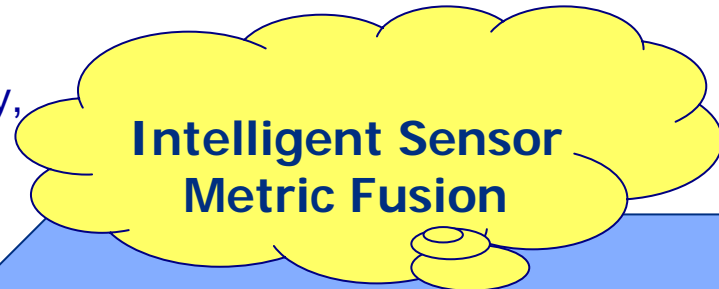
Privacy Protection

- Ensure the privacy of all citizens is protected



Sensor Integration

Integrate and Test new screening methods & technologies for accuracy, speed, throughput, & privacy controls



Transition validated results to augment the existing passenger screening process



**Behavioral Sensors
(Hostile Intent)**

Question Tree

Observation

Verbal

Physiological Sensors

Respiratory

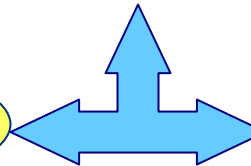
Cardio

Counter Measures

Motion

Thermal

Iris



Reach out to Research



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Sensor Integration Components

Intelligent Fusion

- Sensor output integration and synthesis
- Predict likelihood of individual negative behavior in a contextual situation
- Link observed behaviors and sensor metrics in relationships that are quantifiable
- Create content-based decision mechanisms to provide input to screening authority

Behavioral

- Suspicious Behavior - Real-time, multi-modal, culturally independent hostile intent detection (micro facial, auditory, speech) to identify unknown or potential threats terrorists --- Accurate, real-time, & non-invasive

Physiological

- Real time, multi-sensor measurement of physiological metrics
- Sense at a distance, non-invasive
- Minimize impact on public



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SBTA Program Areas:

Community Preparedness, Response, Recovery

Investing in research to develop:

- Understanding of the impact of public emergency communications;
- Understanding of psychological, social, and economic impacts of catastrophic events to better inform preparedness, response and recovery efforts, and produce more nuanced risk assessments; and
- Effective ways to create a culture of preparedness.

Types Research Questions:

Are there forms of communication which speed response but are also economically feasible for communities to implement?

What factors come into play during individual and community recovery from disasters?



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