

S&T Stakeholders Conference- EAST

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Human Factors Division: Social-Behavioral Threat Analysis

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Science and Technology Directorate
Human Factors Division



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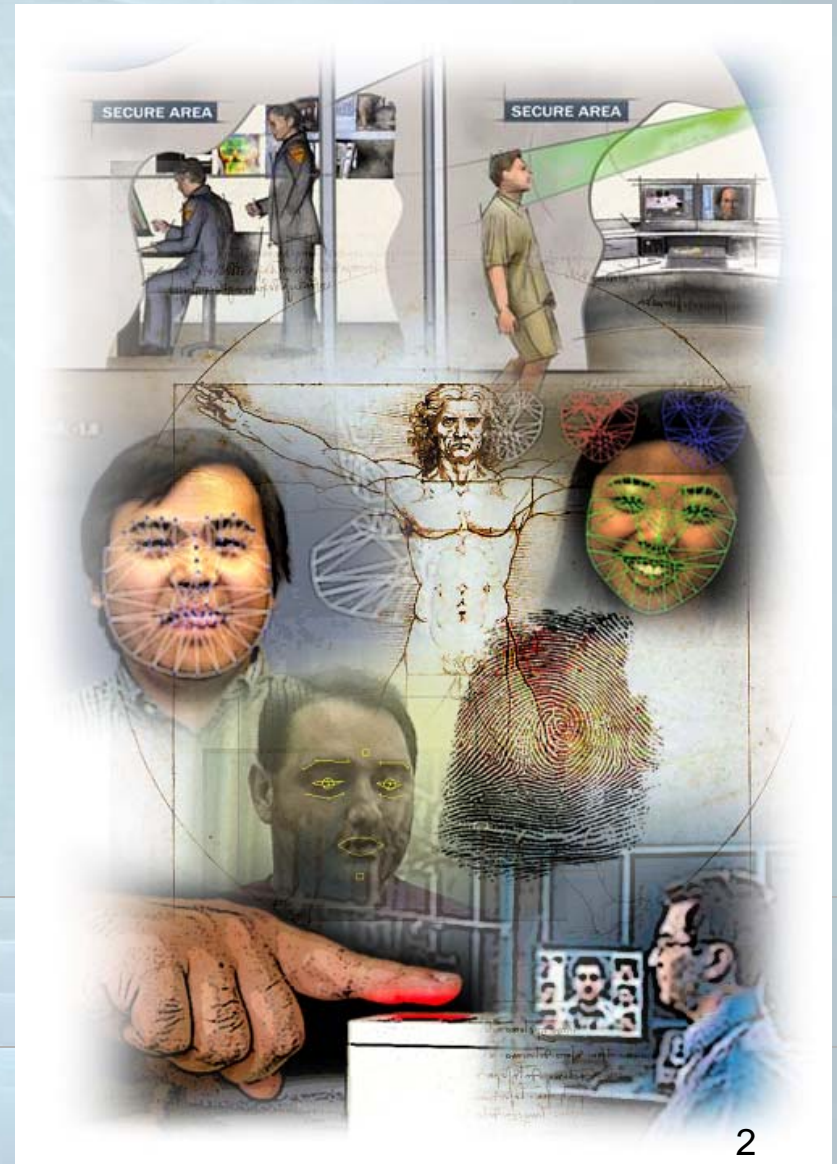
Vision:

Human Factors is committed to ensuring the security of our Nation by integrating the human dimension in developing capabilities to support the analytical, operational and policy needs of Homeland Security.

Mission:

To apply the social, behavioral and physical sciences to improve identification, analysis, and understanding of the threats posed by individuals, groups, and radical movements; to support community preparedness, response, and recovery to catastrophic events; and to advance national security by integrating the human element into homeland security science & technology.

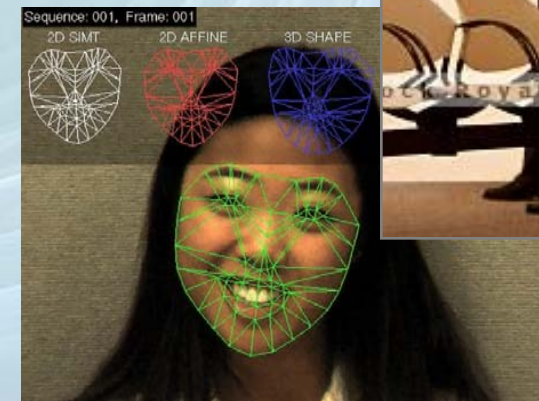
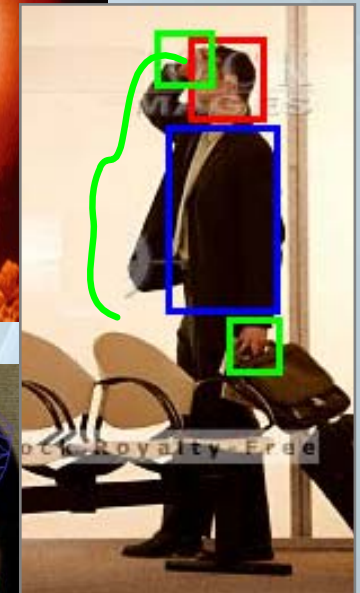
Customers: TSA, US-VISIT, USCIS, ICE, SCO, USSS, FEMA, OI&A, USCG, State & Local, S&T Divisions



HFD Thrust Areas

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

- Social-Behavioral Threat Analysis
 - Precursors, Signatures, and Deterrence of Radicalization
 - Suspicious Behavior Detection
 - Community Preparedness, Response, and Recovery
- Personal Identification Systems
 - Biometrics
 - Credentialing
- Human-Systems Research & Engineering
 - Technology Acceptance and Integration
 - Human-Systems Optimization



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Human Factors Division Goals

1. Enhance the analytical capability of the Department to understand terrorist motivation, intent, and behavior.
2. Improve screening by providing a science-based capability to identify *unknown* threats indicated by deceptive and suspicious behavior.
3. Improve screening by providing a science-based capability to identify *known* threats through accurate, timely, and easy-to-use biometric identification and credentialing validation tools.
4. Enhance safety, effectiveness, and usability of technology by systemically incorporating user and public input.
5. Enhance preparedness and mitigate impacts of catastrophic events by delivering capabilities that incorporate social, psychological and economic aspects of community resilience.

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



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HFD Research on Radicalization and Violent Intent Framing Investments

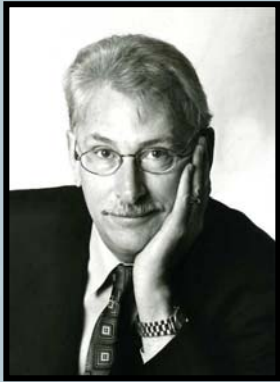
Research priorities that have emerged through various outreach activities include:

- Understanding how radicalization develops within individuals, groups, and societies;
- Measuring the level of radicalization in the U.S. homeland;
- Understanding the roles communities, governments, and civic organizations play in moving individuals towards and away from radical violence;
- Documenting impacts of various media on the spread of radicalization; and
- Developing new methods for data fusion, computational modeling, and simulation.

Informing DHS policy, intelligence, and operations.



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START & HFD



The National Consortium for the **Study of Terrorism And Responses to Terrorism (START)**, a DHS Center of Excellence, conducts basic research on the human causes and consequences of terrorism, using theories, methods, and concepts of the social and behavioral sciences.

~ *START Mission Statement*



The **Human Factors Division (HFD)** applies the social and behavioral sciences to improve detection, analysis, and the understanding of threats posed by individuals, groups, and radical movements.

~ *HFD Mission Statement*



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HFD Research on Radicalization and Violent Intent Counter-IED effort

Program Goals

- Develop actionable indicators to aid the intelligence and law enforcement communities in identifying and deterring those who pose significant threats of IED attacks
- Provide empirical findings to aid policymakers in developing longer term radicalization and IED deterrence efforts

Approach

- Analyze event databases focused on both international and domestic terrorism
- Study the relationship between community attitudes and the violent activities of radical groups using retrospective data
- Conduct comparative case studies of individuals who have and have not conducted U.S. domestic terrorist incidents
- Evaluate IED countermeasures



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HFD Research on Radicalization and Violent Intent Intent Modeling and Simulation

- Intelligence analysis framework that includes:
 - information extraction of indicators of terrorist intentions
 - systematic estimation of future terrorist behavior based on social and behavioral sciences
 - modeling and simulations of influences on future terrorist behavior
- Enables systematic collection and analysis of information related to understanding terrorist group intent to engage in violence
- Enhances analytical methods for estimating a group's intention to engage in violence
- Increases ability to rapidly assemble and test competing scenarios



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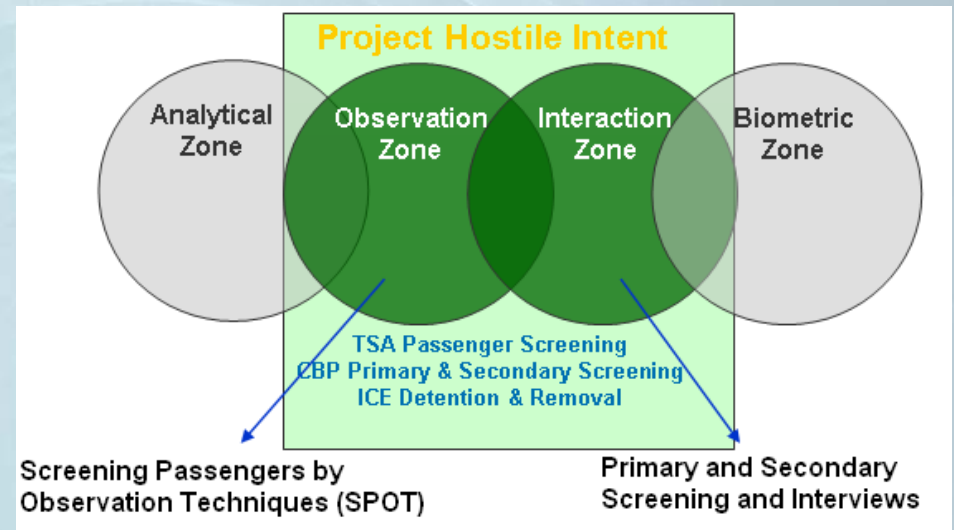
Suspicious Behavior Detection Project Hostile Intent

Goal

- Identify deception and hostile intentions in real-time using non-invasive sensors

Approach

- Validate behavioral indicators of deception and hostile intent
- Develop non-invasive sensor algorithms to detect behavioral indicators in real-time
- Develop a prototype to detect deception and hostile intent in real-time using non-invasive, culturally independent sensors algorithms
- Develop computer-based simulation training



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Suspicious Behavior Detection

Project Hostile Intent – Accomplishments & Events

- Partial validation of behavioral indicators of “intent to deceive about a future action” within a 2 minute high deception base rate environment
- Preliminary validation of TSA’s operational Computer Assisted Passenger Prescreening System (CAPPS) and behavioral Screening Passengers by Observation Techniques (SPOT) programs
- Mobile-SPOT proof of concept demonstration with TSA Behavior Detection Officers
- Interim transition of behavioral indicators of deception embedded into a deception detection training course and support materials
- Upcoming training effectiveness evaluation
- Upcoming data collection to enable cross-cultural validation



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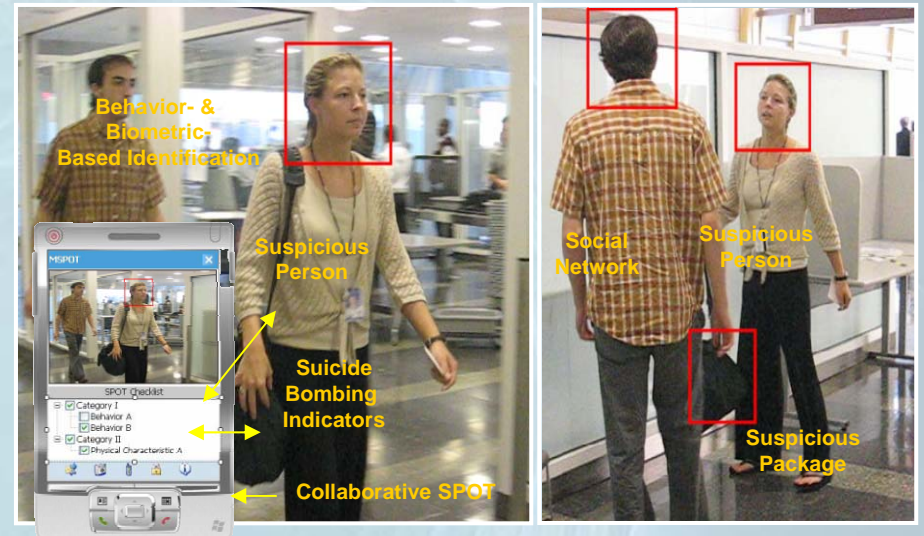
Suspicious Behavior Detection Counter-IED

Goal

- Deter potential attacks
- Predict risk
- Intelligently screen

Approach

- Identify and track suicide bombing behavior & anomalous or suspicious behavior and packages using automation technology
- Leverage validated behavioral indicators to designate and drive automated tracking algorithms
- Extend capability to identify & track potential suicide bombers at longer stand-off distances

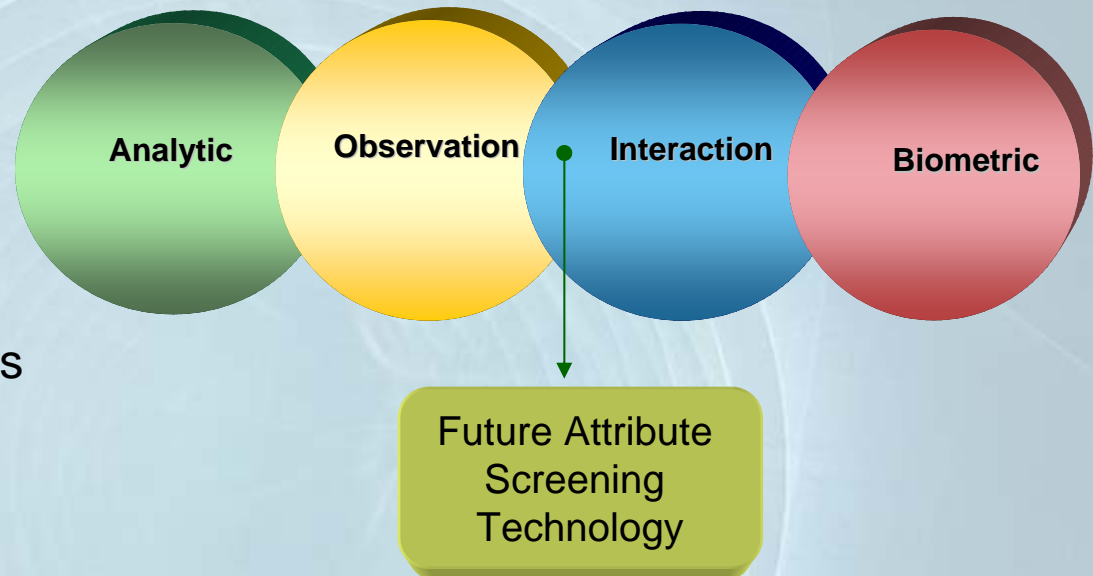


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Suspicious Behavior Detection Future Attribute Screening Technology (FAST)

Goals

- *Improve* user experience; provide automated behavior based screening techniques with integration of multiple physiological screening technology systems; validate technical requirements analysis and establish performance metrics for screening systems



Approach

- Corroborate Basic Premise of Theory
 - Evaluate Individual Psycho-physiological Cues
 - Cues combination of Physiological, Non-Verbal Behavioral and Paralinguistic
- Develop/demonstrate an operational lab environment based on a Special Event Scenario
- Demonstrate functionality of the sensors within the operational lab environment, validating sensor operation



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Suspicious Behavior Detection

FAST – Milestones

Planned Demonstrations

- Deception Sensor Cross Validation/ Demo
- Initial Sensor Suite Integration and Demo
- FAST Mobile Module Virtual Demonstration
- FAST Mobile Module Operational Demonstration

Long Term

- Malintent Indicator Validation
- Screening Technology Demonstrations
- Pilot Experiments and Tests
- Integrated Sensors Systems
- Primary Screening in Operational Environment
- Multi-Function Sensor Suites Prototypes



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Community Preparedness and Resilience

Risk Communication, Public Perception and Public Trust

- Develop a methodology for assessing the impact of risk communications and warnings on the public's response during emergency situations
- Determine the effectiveness of various means of emergency communication on affected populations
- Develop a means for assessing the effectiveness of guidance and direction provided by civic leadership
- Incorporate lessons learned into exercises and training methodologies to improve public warnings during civil emergencies and disasters

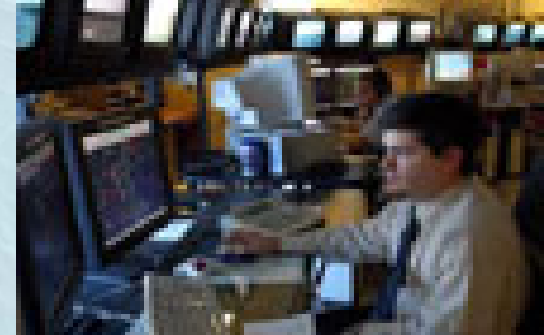


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Community Preparedness and Resilience

Enhancing Emergency Communications and Public Response

- Collect, analyze and classify emergency communications and requests for assistance generated by Texas residents during Hurricanes Katrina and Rita over Texas 211 call system
- Generate a standard template for streamlining the collection of 211 call system information collected by states who operate those systems
- Develop a methodology to overlay call system data onto geospatial mapping to aid in analysis of disaster scenarios, regional evacuation and relief planning, and response procedures



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