



Homeland Security

Science and Technology

The National Center for Border Security and Immigration (NCBSI)

A DHS Science and Technology Center of Excellence



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Research and Education Areas

- Detection, Identification, and Screening
- Adversary Modeling
- Citizenship Administration
- Computational Modeling and Simulation
- Sensor Networks and Communication
- Immigration Policy and Enforcement
- Homeland Security Seminar Series
- Homeland Security Summer Scholars Academy

Mission: To develop technologies, tools and advanced methods that balance immigration and trade with effective border security.

Quick Facts

- Co-led by the University of Arizona in Tucson and the University of Texas at El Paso (UTEP).
- Both Center headquarters are located within 60 miles of the U.S.-Mexico border.
- Each year, the Center funds approximately 60 undergraduate and graduate students.
- The Center regularly collaborates with Minority Serving Institutions, bringing together students and faculty from diverse backgrounds to study border security and immigration issues.
- The Center pursues challenges faced by border security and immigration stakeholders that impact national security, border economics, and trade and travel, to inform the community and contribute to the public good.

Background

- NCBSI was officially launched as a Department of Homeland Security Center of Excellence in August 2008. The Center conducts basic and applied research to develop technologies, tools and advanced methods that balance immigration and trade with effective border security; assess threats and vulnerabilities; improve surveillance and screening; analyze immigration trends; and enhance policy and law enforcement efforts.

Key Accomplishments

- In 2014, the Center completed a report that examined the depth and scope of the unaccompanied alien children (UAC) problem in the Rio Grande Valley of South Texas. The report was featured in 70 news articles and programs, including the cover story of *The Washington Post* Sunday edition (July 20, 2014).
- The Center launched the Homeland Security Seminar series in 2013 that focused on addressing the education and supplemental training needs identified by homeland security stakeholders at all government levels.
- The Center worked with El Paso Border Patrol in 2013 and 2014 to identify change detection and response capabilities and collect stakeholder data to develop a surveillance and response optimization model.



Research Partners

Arizona State University
Georgetown University
Migration Policy Institute
New Mexico Institute
of Mining & Technology
New Mexico State University
Pennsylvania State University
RAND Corporation
RTI International
San Diego State University
University of Arizona
University of California – Irvine
University of California – San Diego
University of Connecticut
University of Minnesota
University of Nebraska at Omaha
University of Rutgers
University of Southern California
University of Texas – Pan American
University of Washington
West Virginia University

Key Research Projects

- AVATAR
- CBP Consequence Delivery Programs
- Coverage Estimates and Measures of Unauthorized Migration
- Deferred Action for Childhood Arrivals
- Localization and Tracking of Vehicles, Cargo, and Persons
- Navigation System for Unmanned Aerial Vehicles
- Older Adult Learning for Naturalization Examination
- Optimized Patrol Strategies Based on Change Detection Capabilities
- Research Model for Custody and Care Placements for Unaccompanied Minors
- Visual Vigilance During Screening

Key Education Projects

- CBP Supervisory Curricula Program Review
- Homeland Security Seminar Series for Stakeholders at All Government Levels

NCBSI/BORDERS Highlights

Unaccompanied Alien Children

The UAC Project began in response to the significant increase in this illegal immigration. It examined how DHS and Health and Human Services resources could best be used under conditions of increasing volume to meet legal obligations for the care and custody of those arrested, while reducing the diversion of resources from other critical missions. The final report was delivered in March.

AVATAR

Using artificial intelligence and sensor technologies, Center researchers have developed a “virtual agent” – AVATAR – designed to interview an individual and capture behavioral and physiological cues with non-invasive sensors. The suite of tested sensors measure the individual’s vocalics, kinesics, eye gaze, facial features, and pupil dilation to assess credibility.

Unlike human screeners who can become fatigued or distracted, the AVATAR is designed to maintain consistent vigilance to allow human agents to focus on high-risk travelers and facilitate the flow of legitimate trade and travel. The AVATAR was field-tested in Nogales, Arizona, where it interviewed volunteer travelers participating in U.S. Customs and Border Protection’s (CBP) Trusted Traveler Program.



Homeland Security Summer Scholars Academy

The Homeland Security Summer Scholars Academy is a 10-week embedded summer research or internship experience for academically inclined university scholars nationwide with an expressed interest in homeland security related careers in both the private and public sectors. The Academy provides an opportunity for undergraduate and master’s level students to work closely with UTEP professors engaged in new or ongoing research on border security and immigration or to work under the mentorship of a homeland security/law enforcement practitioner in an embedded internship with a local homeland security stakeholder. Visit the [Homeland Security Summer Scholars Academy website](#) to find out more about the program.

