Science & Technology Directorate

National Center for Border Security and Immigration (NCBSI)

COE S&T Review

March 2014

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NCBSI Co-Directors
Washington, D.C.
NCBSI Overview

**COE Description**

- **Mission Statement:** To develop technologies, tools and advanced methods to balance immigration and trade with effective border security, as well as assess threats and vulnerabilities, improve surveillance and screening, analyze immigration trends, and enhance policy and law enforcement efforts.

**Co-Leads**

- **University of Texas, El Paso – National Center for Border Security and Immigration (NCBSI)**
  - Health and Biomedical Science and Engineering
  - Cyber security and infrastructure protection
  - Education for the 21st Century
  - National Defense and Border Security
  - Global Enterprise and Border Studies

- **University of Arizona – BORDERS**
  - Detection, Identification and Screening
  - Sensor Networks and Communication
  - Immigration Policy and Enforcement

**History and Funding**

- Established in 2008
- NCBSI has received the following funds through OUP vehicles:
  - $17.56M in base financial assistance funding from OUP
  - $2.33M in financial assistance funding from other sources
  - $974K in contract funding under the Basic Ordering Agreement
## BORDERS Research Overview

### Research Theme Areas
- Detection, Identification and Screening
- Sensor Networks and Communication
- Immigration Policy and Enforcement

### Expected Uses
- Improved screening at POEs, airports, detention centers, visa approvals, benefits and asylum requests, personnel screening, personnel applications, etc.
- Improved tracking of vehicles, cargo and persons
- Improved cell-phone based GPS denied navigation systems for small UAVs
- Assessment of CBP Consequence Delivery Programs
- Better estimates of Mexican-born population in U.S.
- Improved measures of circular migration from Mexico
- Improved understanding of DACA usage & consequences
- Better identification of human trafficking in U.S.
- Better understanding of legal immigrants in U.S.

### Customers
- CBP (OFO, OBP, OTIA)
- USCIS
- Blue Campaign
- ICE
- TSA
- S&T
- Secret Service
- FEMA
- FLETC
- State Department
## Project Description

Automated Virtual Agent for Truth Assessments in Real-Time (AVATAR)

**Goals:**
- Build a commercial-ready prototype to interview people in credibility assessment scenarios and detect emotional and cognitive states
- Designed for use at Ports of Entry, airports, detention centers, visa approvals, benefits and asylum requests, personnel screening, personnel applications, etc.
- Conduct lab and field tests to determine efficacy of kiosk system in different environments
- Select sites for potential organizational implementation
- Analyze current processes and procedures
- Generate new process flow to leverage human and kiosk capabilities
- Customize kiosks for designated applications

## Impact & Relevance

- Advance the field of credibility assessment by measuring based on new linguistics, vocalics, kinesics, and psychophysiological cues
- Detect cues of deception and malicious intent that are not perceptible to human senses
- Act as a force multiplier to alleviate the traffic load on human officers and improve human decision-making
- Expedite throughput by segmenting low-risk and high-risk travelers
- Investigate pitfalls and opportunities in human acceptance of automated screening agent systems

## End Users/Partners

**In Development**
- CBP (Trusted Traveler program, pedestrian crossings, document verification, primary/secondary screening, detention centers)
- USCIS (Benefit applications, refugee/asylum seeker interviews)
- TSA (Passenger security screening, document processing and passenger identification)
- U.S Secret Service (Event/building entrance screening)
- FEMA (Disaster assistance interviews)
- FLETC (Rapid screening and interviewing training for DHS personnel)
- State Department (visa adjudication and document verification)
# Professional Development
- **Professionals attending online continuing education or graduate education programming:**
  - Total: 90 enrolled
  - Industry: Accenture, American Express, Bank of America, Barnes & Noble, Boeing, Exxon, IBM, Lockheed Martin Corporation, Microsoft, Raytheon Missile Systems, Verizon Wireless, Ventana Medical
- **Professional development events and training programs delivered:**
  - On-line programs include: Masters in Management Information Systems (MIS), Enterprise Security Certificate, Business Intelligence and Analytics Certificate

## Workforce Development
- **Certificates or degree programs offered:**
  - PhD, Masters, online Masters and Certification
- **Courses developed:**
  - PhD, Graduate, Online Masters and Certification
- **Research areas of 14 COE-supported students:**
  - Deception detection (10 students)
    - Includes: computer vision, facial analysis, linguistics, vocalics, affective computing, HCI
  - Cybersecurity (2 students)
  - Privacy (2 students)
- **Student fellowships offered:** 4 (3 CDG and 1 Dean)
- **Type of COE-supported students:** PhD, Masters, Undergraduates

## Description
- Educational activities at BORDERS occur through direct involvement of undergraduate and graduate students in research projects and incorporation of research materials into course curricula.

## Goals
- Familiarize students with DHS’ mission and research needs
- Foster expertise in the HS-STEM and immigration-related disciplines

## Outcomes
- 8 peer-reviewed journal articles co-authored by BORDERS funded students
- 30 conference proceedings in 2013

## Collaborations/Partners
- **Adjunct faculty from government or industry working with students and other mentorship arrangements:**
  - Industry: Microsoft, Irvine Sensors, MorphoTrak
  - DoD – National Center for Credibility Assessment
  - Frontex
- **Other experiential student education:**
  - Student development of proposals (DHS, NSF, Frontex)
  - Demos/presentations at conferences and workshops
  - Presentations to COE visitors: Congressional delegations, Canada, Ft. Huachuca, industry leaders, alumni

## Professional Development
- **Professionals attending online continuing education or graduate education programming:**
  - Total: 90 enrolled
  - Industry: Accenture, American Express, Bank of America, Barnes & Noble, Boeing, Exxon, IBM, Lockheed Martin Corporation, Microsoft, Raytheon Missile Systems, Verizon Wireless, Ventana Medical
- **Professional development events and training programs delivered:**
  - On-line programs include: Masters in Management Information Systems (MIS), Enterprise Security Certificate, Business Intelligence and Analytics Certificate
# BORDERS Education – MISonline: Enterprise Security Certificate

## Description
- This online program addresses top IT concerns with courses designed for information security professionals in industry and government.
- Leverages Management Information Systems (MIS) department’s designation by the NSA and DHS as a Center of Academic Excellence in Information Assurance Education (CAE-IAE)

## Goals
- Gain critical knowledge needed to secure information and information systems
- Understand how to combat potential cyber-threats and attacks that endanger agency data

## Impact & Relevance
- Through these web-delivered programs supported by world-class faculty, DHS’ IT workforce will gain the critical knowledge needed to secure information and information systems in the areas of confidentiality, integrity, and availability
- **Upon completion, students receive:**
  - Graduate Certificate from UA
  - NSA Committee on National Security Systems certificate
  - 1-year of qualified work experience toward the Certified Information Security Manager (CISM) designation

## Educational Capabilities & Opportunities
- **Enterprise Security Certificate courses:** Information Security in Public & Private Sectors; Information Security Risk Management; Systems Security Management; Information Systems Security Professionals; Senior Systems Managers; Risk Analysis; System Administrators
- **Business Intelligence and Analytics Certificate:** Big Data Analytics from a Top-Ranked Program
  - Designed for IT professionals and program managers involved in analyzing data
  - Provides fundamentals of database mining, analysis, design, and information
  - Identify data securing methods, model and analyze data for strategic decision making, and leverage productive analytical technique that drive better risk assessments
- **New course:** Detection of Deception and Intent (MIS 529E) in Spring 2014
  - Focuses on deception in human communication, including a) what is deception, b) current and novel deception detection techniques, and c) detecting deception in real-world scenarios
  - Instructor: Dr. Nathan Twyman, BORDERS post-doc
<table>
<thead>
<tr>
<th>Accomplishment</th>
<th>Impact/End Users</th>
</tr>
</thead>
</table>
| Science Behind the AVATAR Workshop (Nov. 2013)                                | ▪ Convened SMEs in credibility assessment from around the world and DHS practitioners  
▪ Reviewed research to date and identified agenda for next 5-10 years  
▪ Disciplines included psychology, bio-engineering, cognitive science, neuroscience, oculometrics, HCI, behavioral psychology, criminal psychopathy, sociology and law  
▪ Conclusions: Strong scientific foundation, guided by relevant research; uses sound scientific methods for experiments and pilots; provides meaningful scientific contributions; has potential to benefit society; should continue research activities to further scope and utility |
| $5.4M in Cybersecurity Big Data Grant Awarded                                  | ▪ MIS faculty awarded 2 security big data grants from NSF to address the significant cybersecurity research and education challenges facing the United States and international community.  
▪ Cybersecurity Scholarship-for-Service (AZSecure) will support 40 undergraduate, graduate and doctoral students over next 5 years ($4.2M)  
▪ Interdisciplinary research team understanding cyber attackers and attacks via social media analytics ($1.2M) |
| BORDERS has hosted 4 MSI Summer Research Teams since 2010                      | ▪ The 2012 recipient of the MSI SRT program at BORDERS, Dr. Yuhong Zhang of Texas Southern University, received follow-on funding to continue her work investigating advanced signal processing techniques and continues to collaborate with BORDERS researchers on this project. |
NCBSI Research Overview

Research Theme Areas

- Optimal Practice Schedules for Enhancing Encoding and Long-term Retention of Novel Information in Older Adults
  - Experimental: Lab-based
- Operations Research Model to Increase the Availability of Custody and Care Placements for Unaccompanied Alien Children (UAC)
  - Field Visits, Interviews, & Operational Modeling
- Development of Optimized Patrol Strategies Based on Change Detection Capabilities
  - Experimental: Lab-based as well as Field testing
- HSI El Paso Tunnel Project: Information Collection, Consolidation, and Analysis of Interconnecting Tunnels in the El Paso Region
  - Field Visits, Compilation of Existing Data/Maps

Expected Uses

- Enhance memory retention for older adults seeking to pass the U.S. Citizenship test.
- Develop operational models that increase efficiency of UAC processing, and humanitarian care. Clearly define scope of UAC challenges to inform policy decisions.
- Development and testing of an optimization model for the deployment of surveillance resources in remote border areas
- Build a comprehensive GSI map of the tunnels in the El Paso region to be used by DHS and state and local agencies.

Customers

- DHS Science and Technology Directorate
- DHS Immigration and Customs Enforcement, Enforcement and Removal Operations
- DHS Immigration and Customs Enforcement, Homeland Security Investigations
- DHS Citizenship and Immigration Services
- DHS Customs and Border Protection
- DHS Transportation Security Administration
- DHS Policy – Office of Immigration Statistics
- Blue Campaign
NCBSI – Development of Optimized Patrol Strategies Based on Change Detection Capabilities

Description
- The U.S. Border Patrol seeks assistance in developing a methodology that utilizes evolutionary algorithms to optimize targeted enforcement efforts in low risk areas through the use of change detection resources.
- Develop a methodology to optimize the use of Customs and Border Protection (CBP) resources to monitor change along the border and respond effectively when change is detected.
- The aim of this project is to assist the Border Patrol in effectively optimizing resources to maximize border security efforts between the ports of entry.

Impact & Relevance
- Provides CBP leaders with a methodology for the optimal deployment of change detection resources to low risk border areas.
- Effectively optimizes resources to maximize border security efforts between the ports of entry.

End Users/Partners
- CBP, in particular the U.S. Border Patrol
- Other public, private, or military entities charged with monitoring remote geographic areas for change
NCBSI Education Overview

Description
- The NCBSI’s educational programs/initiatives is twofold:
  1. Educational seminars for active homeland security enterprise stakeholders
  2. Education for prospective and rising professionals

Goals
- Increased educational attainment within the current DHS community and the HS enterprise
- Attract the next generation of homeland security professionals

Collaborations/Partners
- Adjunct faculty from government or industry working with students and other mentorship arrangements:
  - CBP Office of Border Patrol & Office of Field Operations
  - Homeland Security Investigations
  - Transportation Security Administration
  - Bureau of Alcohol, Tobacco, Firearms & Explosives
  - El Paso County Sheriff’s Office
  - El Paso City/County Office of Emergency Management
- Other experiential student education:
  - Border Security and Immigration topics researched annually by undergraduate scholars under our Homeland Security Scholars Academy
  - Student imbedded internships

Workforce Development
- Certificates or degree programs offered:
  - Undergraduate certificate programs: North American Relations and Border Security
  - Undergraduate degree programs: Bachelors concentration in Homeland Security, B.S. in Forensics, and B.A. in Security Studies
- Research areas of COE-supported students:
  - Border Security (12 students)
  - Immigration (16 students)
  - Education (41 students)
- Type of COE-supported students:
  - Undergrad. Students (56), Master’s (11), & Ph.D. (2)

Professional Development
- Professional development events and training programs delivered:
  - Terrorism Trends on the Southwest Border
  - Cyber-Terrorism
  - Bioterrorism
  - ICS Command Training
  - Incident Response to Terrorist Bombings
- Future 2014 Seminars
  - Bomb Threat Management
  - Incident Command System Tabletop Exercise
  - Bioterrorism Live Exercise
**NCBSI Education – Homeland Security Seminar Series**

<table>
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<tr>
<th>Description</th>
<th>Impact &amp; Relevance</th>
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<tbody>
<tr>
<td>Education workshops designed for regional homeland security stakeholders on specific topics relevant to border security and immigration.</td>
<td>These non-credit seminars contribute to the continuing education and training of active members within the homeland security enterprise.</td>
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</tbody>
</table>

**Goals**
- Increased competency within the DHS community, state, and local law enforcement.
- Providing training and education opportunities for homeland/border security stakeholders

**Impact & Relevance**
- Topic and courses are identified by homeland/border security stakeholders with input from NCBSI
- Training benefits DHS as well as federal, state, and local partners

**Educational Capabilities & Opportunities**
- Seminars taught in their entirety or essential segments of established courses
- Serve as a platform for training and education that targets specific agencies and helps identify HS education needs from local stakeholders at all levels (as appropriate)
- The NCBSI supplies the venue and academic expertise including subject matter expertise from other relevant institutions
- Future seminar plans include: an applied bioterrorism exercise, an incident command system table -op exercise for law enforcement, incident response to terrorist bombing, transnational criminal organizations trends on the Southwest border and bomb management courses
## NCBSI Research and Education Successes

<table>
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<tr>
<th>Accomplishment</th>
<th>Impact/End Users</th>
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| **Older Adult Learning**: Developed and tested distributed learning protocols with immediate and delayed recall impacts for older adults | - Transition of research in progress to support USCIS’s efforts for designing classroom learning curriculum and/or self-learning for citizenship classes and exams. The efforts of this project are designed to improve the success rate of older adults taking the citizenship examination.  
  - Methodologies for training citizenship class teachers on best teaching practices  
  - Informational brochure for older adults preparing to take the naturalization examination will be developed. |
| **Homeland Security Seminar Series**  
  - Terrorism Trends on the southwest Border  
  - Cyber Threats, Security, & Critical Infrastructure Protection  
  - Bioterrorism: Threat Agents, Countermeasures & Response Capabilities  
  - EL Paso Jurisdiction Incident Command System Training | - Training and educational workshops open to all first responders and homeland security related stakeholders at all government levels.  
  - Average number of seminar participants: 77  
  - Approximately 300 stakeholders to date have attended the trainings offered and received their certificates of completion.  
  - Stakeholders from over 35 agencies have participated in the seminars. |
| **Homeland Security Summer Scholars Academy** | - To date 40 undergraduate scholars have successfully completed our internship program and prepared themselves for enrollment in a relevant graduate program or future homeland security-related careers  
  - Prepares the future operators and practitioners that DHS needs  
  - Imbedded internships with local agencies prepare and help our scholars successfully transition into homeland security relevant careers. Seven agencies currently host scholars under our imbedded internship program option. |
Supplemental Material
### Principal Partners

<table>
<thead>
<tr>
<th>University of Arizona</th>
<th>Areas of Expertise/Core Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deception Detection; Human Communications; Collaboration Technology; Cyber Security; Data Mining and Visualization; Wireless Sensor Networks; Fiber Optics; Micro Unmanned Vehicles; Transportation Systems; Vehicle Detection; Immigration; Economic Development and Trade</td>
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</tbody>
</table>

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<tr>
<th>University of California – Irvine</th>
<th>Areas of Expertise/Core Capabilities</th>
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<tbody>
<tr>
<td></td>
<td>U.S.-Mexican Migration, Demographics, Visa-overstays, Unauthorized Population Estimates</td>
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<tr>
<th>University of California – San Diego</th>
<th>Areas of Expertise/Core Capabilities</th>
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<td>Determinants of DACA applicants; Immigration Integration</td>
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<tr>
<th>University of Minnesota</th>
<th>Areas of Expertise/Core Capabilities</th>
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<td>Navigation, Guidance and Control of Vehicles; Optimization and Systems</td>
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<tr>
<th>Migration Policy Institute</th>
<th>Areas of Expertise/Core Capabilities</th>
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<tbody>
<tr>
<td></td>
<td>Immigration Policy and Management; Settlement and Integration; Refugee Protection</td>
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</tbody>
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### Extended Partner Network

**Non-University Partners**: Frontex, Singapore Ministry of Home Affairs, Giant Oak

**University Partners**:
- West Virginia University: Biometrics (fingerprints, iris, facial, gait)
- University of Nebraska: Deception Detection
- San Diego State University: High Spatial Resolution Airborne Imagery
- Georgetown University: International Migration, Human Trafficking, Immigration and Refugee Law and Policy, Comparative Migration Studies
- Carnegie Mellon Institute
- Montclair State University
## BORDERS Student Placements

<table>
<thead>
<tr>
<th>Placements</th>
<th>Post- Doctoral Fellowships</th>
<th>Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academia</td>
<td>Imperial College, London UK University of Nebraska- Omaha, University of Arizona</td>
<td>University of Nebraska- Omaha, Rutgers University, University of Oklahoma, University of New Mexico, Montana State University, Brigham Young University, AFIT, Bentley University</td>
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# BORDERS Research Areas

<table>
<thead>
<tr>
<th>Research Area</th>
<th>Approaches</th>
<th>Expected Uses</th>
<th>Customers</th>
<th>COE Partners</th>
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</thead>
</table>
| Detection, Identification and Screening | ▪ Credibility assessment  
▪ Insider threats  
▪ Identity verification | ▪ Ports of Entry (primary and secondary)  
▪ Trusted Traveler Programs  
▪ Asylum applications  
▪ Employee re-verification  
▪ Events screening | ▪ CBP  
▪ ICE  
▪ USCIS  
▪ USAS | ▪ UA  
▪ WVU  
▪ UNO  
▪ SDSU |
| Sensor Networks & Communication      | ▪ GPS anti-spoofing  
▪ Mini-UAS | ▪ Trusted Trader Programs  
▪ Aerial surveillance | ▪ S&T | ▪ UMN  
▪ UA |
| Immigration Policy and Enforcement   | ▪ Post-apprehension surveys  
▪ Assessments of border security metrics and programs  
▪ Measures of unauthorized migration  
▪ Human Trafficking | ▪ Evaluation of Consequence Delivery System  
▪ Development of Border Metrics  
▪ Resources for comprehensive immigration reform policies  
▪ Identification of human trafficking victims | ▪ USCIS  
▪ ICE  
▪ OIS | ▪ MPI  
▪ UCI  
▪ UCSD  
▪ UA  
▪ Georgetown  
▪ Carnegie Mellon  
▪ Montclair State University  
▪ Giant Oak |
# BORDERS Highlights

<table>
<thead>
<tr>
<th>Accomplishment</th>
<th>Impact</th>
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<tr>
<td>OBP Checkpoints: Completed</td>
<td>- Recommends performance metrics for checkpoints</td>
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<td>- Recommends community impact metrics of checkpoints</td>
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<td>- Evaluates current data collection procedures and offers recommendations for improvement</td>
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<td>- Improves operational decisions regarding resource allocations</td>
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<td>- End User: CBP – OBP</td>
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<tr>
<td>OIS Post-apprehension Survey: Completed</td>
<td>- Provides a demographic profile of apprehended border crossers in Tucson Sector</td>
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<td>- Assesses the intent of apprehendees to re-enter the US in near and long-term</td>
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<td>- Provides insights into the decision to cross/not cross in the future and consequence delivery system</td>
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<td></td>
<td>- End User: DHS – Office of Policy, OIS; CBP - OBP</td>
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<tr>
<td>SENTRI Trusted Traveler Pilot Study: Completed</td>
<td>- Conducted 300 interviews (English and Spanish)</td>
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<td>- Proves ability of AI agent to conduct automated interviews</td>
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<td>- Demonstrates risk segmentation approach for low-risk screening scenario</td>
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<td>- Shows user acceptance to AVATAR</td>
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<td>- Demonstrates officer receptivity to AVATAR</td>
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<td></td>
<td>- End Users: CBP – OFO, Admissibility and Passenger Programs</td>
</tr>
<tr>
<td>Measures of Effectiveness of Border Control: Completed</td>
<td>- Analyzes strengths, weaknesses and technical details of available border security metrics</td>
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<tr>
<td></td>
<td>- Offers alternative border metrics based on roundtable discussions with prominent stakeholders</td>
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<tr>
<td></td>
<td>- End Users: CBP; ICE; Office of Policy; OIS</td>
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### Principal Partners

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<tbody>
<tr>
<td>University of Arizona</td>
<td>Innovative Technology, Deception Detection, and Operational Processes.</td>
</tr>
<tr>
<td>University of Southern California</td>
<td>Modeling and Simulation, Economic Analysis, and Game Theory.</td>
</tr>
<tr>
<td>Rutgers University</td>
<td>Modeling and Simulation, Interoperability, and Data Analysis.</td>
</tr>
<tr>
<td>Carnegie Mellon University</td>
<td>Social Media Interconnectivity and Link Analysis</td>
</tr>
</tbody>
</table>

### Extended Partner Network

**Non-University Partners:** CBP, ICE HSI, FLETC, TSA, USCIS, State and local law enforcement

**University Partners:** University of South Carolina

*Indicates MSIs
### NCBSI Student Placements

<table>
<thead>
<tr>
<th>Placements</th>
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<th>Jobs</th>
</tr>
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<tbody>
<tr>
<td><strong>DHS</strong></td>
<td>▪ Homeland Security Investigations</td>
<td>▪ CBP-Office of Border Patrol</td>
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<td></td>
<td>▪ CBP-Office of Border Patrol</td>
<td>▪ CBP-Office of Field Operations</td>
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<td></td>
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<tr>
<td></td>
<td>▪ Transportation Security Administration</td>
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<tr>
<td><strong>Federal Government</strong></td>
<td>▪ Bureau of Alcohol, Tobacco, Firearms &amp; Explosives</td>
<td>▪ Navy</td>
</tr>
<tr>
<td><strong>State and Local Government</strong></td>
<td>▪ El Paso City/County Office of Emergency Management</td>
<td>▪ Colorado Springs Police Department</td>
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<td></td>
<td>▪ El Paso County Sheriff’s Department</td>
<td>▪ Los Angeles County Sheriff’s Office</td>
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<td>▪ City of New York</td>
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<td><strong>Private Sector</strong></td>
<td>▪ Secure Origins</td>
<td>▪ Lockheed</td>
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<td>▪ TEK Systems</td>
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<tr>
<td><strong>Academia</strong></td>
<td>40 Undergraduate interns successfully completed their research internships under our Homeland Security Summer Scholars Academy</td>
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# NCBSI Research Areas

<table>
<thead>
<tr>
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<th>COE Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Enhancing Memory Retention in Older Adults, Who Study for the Naturalization Examination</td>
<td>Experimental Psychology, Advanced Analytics and Statistics, Field Implementation</td>
<td>Improve high failure rates of elderly on the naturalization examination by enhancing memory retention, Inform the development of new methodologies for teaching and training citizenship classes</td>
<td>USCIS, Individuals preparing to take the naturalization examination, Community stakeholders, such as teachers of citizenship or ESL classes</td>
<td>None</td>
</tr>
<tr>
<td>2. Development of optimized patrol strategies based on change detection capabilities</td>
<td>Evolutionary algorithms, Field Interviews, Experimental Testing, Operational Modeling</td>
<td>Optimize CBP resources to monitor change along border, Enhance response times to change detection, Optimize targeted enforcement efforts in low risk areas</td>
<td>U.S. Border Patrol, CBP Policy and Analysis Division, State and Local law enforcement</td>
<td>None</td>
</tr>
<tr>
<td>3. Immigration Policy and Enforcement (UAC Project)</td>
<td>Interviews and surveys, Economic models, Operational Modeling</td>
<td>Improve Interagency communication, Make system process more efficient, Inform policy decision-makers</td>
<td>CBP, ICE, HHS ORR</td>
<td>Rutgers University, University of Southern California</td>
</tr>
<tr>
<td>Accomplishment</td>
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<tr>
<td>USCIS approached NCBSI for Older Adults Optimal Practice Schedules Project</td>
<td>▪ Potential development of novel learning techniques modules for older adults leading to higher citizenship test pass rates</td>
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</tr>
<tr>
<td>At the request of OBP, NCBSI is examining Checkpoints operations in response</td>
<td>▪ Assisting OBP in response to GAO Report ▪ Potential deployment of tools, models and practices to understand the effectiveness of</td>
<td></td>
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<tr>
<td>to GAO Report No. GAO – 09 – 824</td>
<td>checkpoints and their impact on surrounding communities</td>
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<tr>
<td>Developed software tools for cross-border disease spread modeling</td>
<td>▪ Tools for cross-border modeling could help to better understand changes in migration and impact on border communities caused by epidemics</td>
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<tr>
<td>Developed three new certificate and degree programs:</td>
<td>▪ The combination of short and long term programs will educate and train current and future practitioners ▪ The programs will help</td>
<td></td>
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<tr>
<td>▪ Undergraduate certificate in North American Relations and Border Security</td>
<td>build a pipeline to provide HSE stakeholders with a trained and qualified workforce</td>
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<td>▪ Bachelors concentration in Homeland Security</td>
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<td>▪ Four track Bachelors of Science degree in Forensics</td>
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<tr>
<td>Developed Homeland Security Seminar Series for local HS stakeholders</td>
<td>▪ Provides continuing education to supplement training for various stakeholders, such as CBP and ICE</td>
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<tr>
<td>Establishment of Homeland Security Summer Scholars Academy</td>
<td>▪ Engagement of undergraduates to establish a pipeline of personnel for the HSE</td>
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