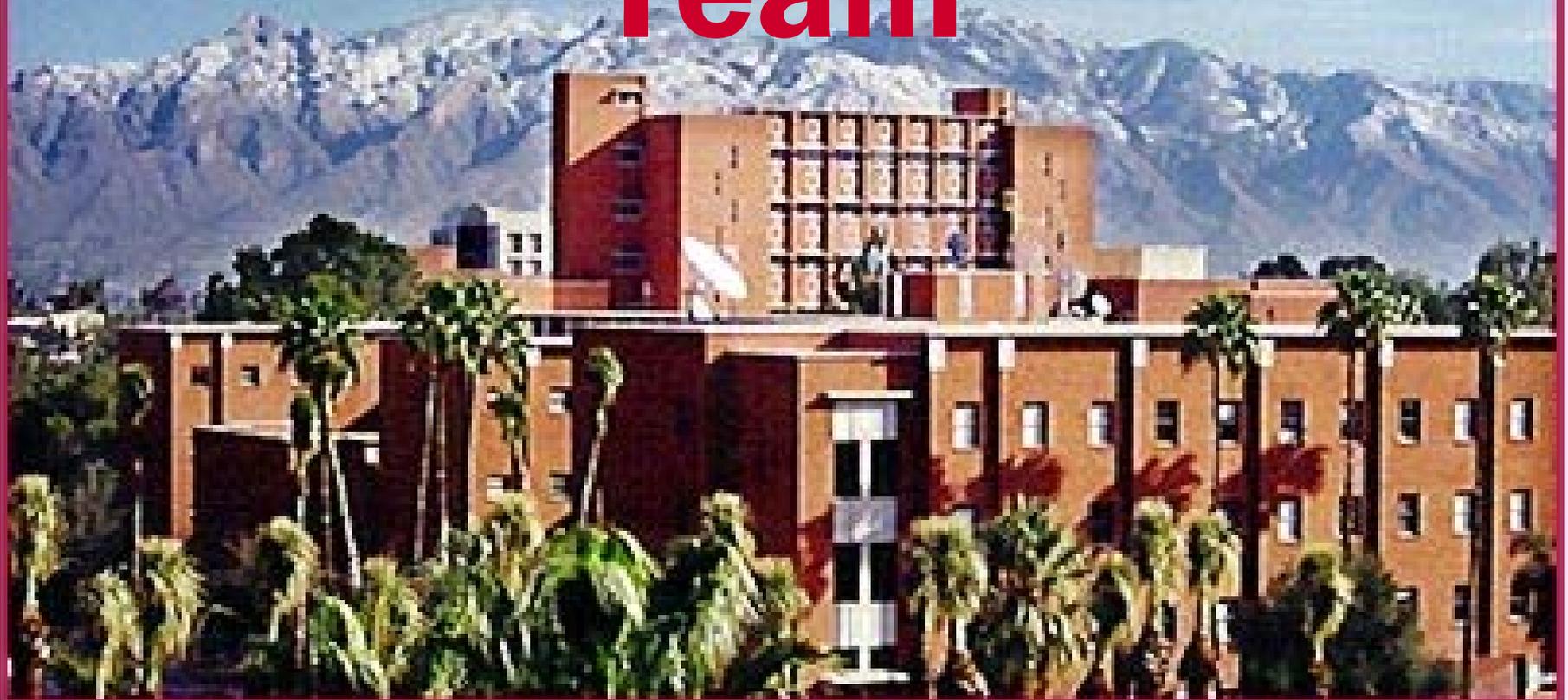


Photo by Rajeev Ramamurthy

University of Arizona Team



Center of Excellence for Research in Border Security & Immigration

- Mission: To become a national asset in:
 - Ensuring security on the southern and northern borders through technology applications
 - Providing data and models to understand and address the dynamics and root causes of immigration
 - Aligning technology and policy through research

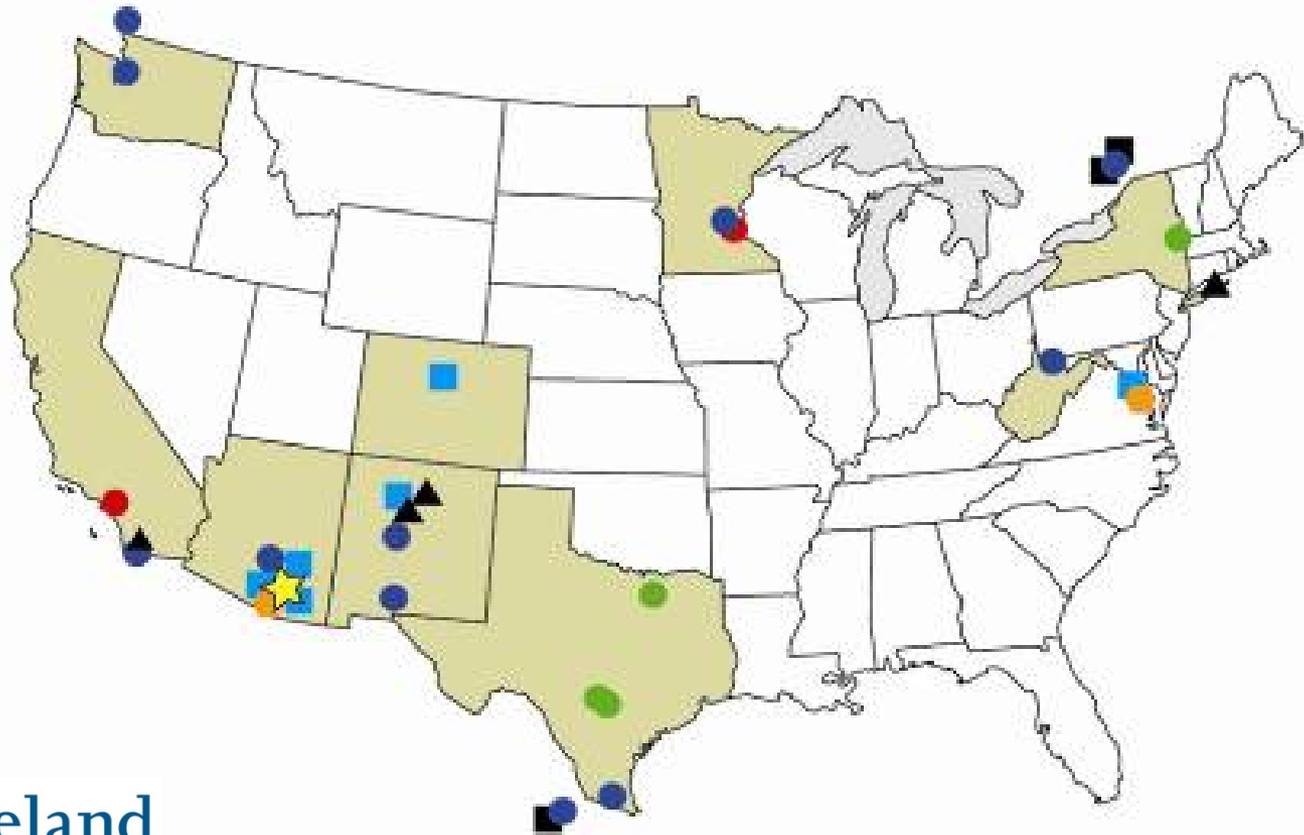


Center of Excellence for Research in Border Security & Immigration

- Impact and Relevance
 - Identify best-of-breed products, tools and practices
 - Develop prototype systems to analyze illegal activity
 - Develop novel, improved sensors and sensor networks
 - Develop prototype systems for data fusion and summarizations
 - Provide improved estimates of illegal population
 - Identify cost-effective means for immigration enforcement
 - Estimate the economic impact of immigration



University Partners and Affiliates



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Advantages to DHS S&T

- We live and work on the border
- Border incidents appear daily in local press
- Highly-leveraged projects
- Extensive labs and testing facilities
- Science-based immigration studies
- Use of collaboration technologies



Project 2 – Cargo, Vehicle & Human Identification, Human Intent Identification, and Decision Support

- Develop models to ID high-risk cargo & vehicles
- Develop methods to embed security features into the supply chain
- Investigate biometrics with novel methods of identification, detection and intent
- Investigate the effectiveness of interviewing tools and techniques
- Evaluate biometric tools such as LDV, eye-tracker, thermal scanner and NIR pupillometry

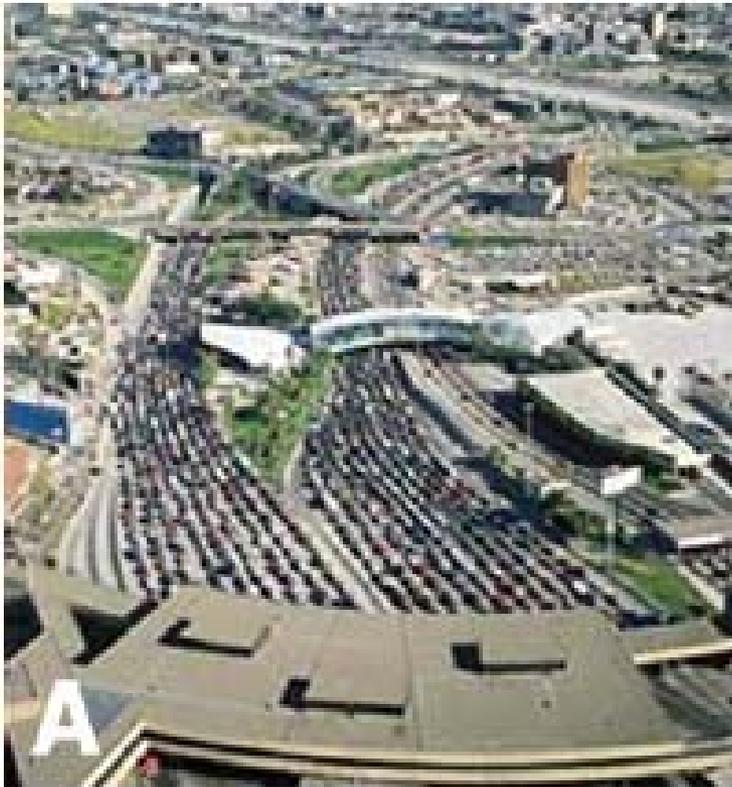


Project 2 – Cargo, Vehicle & Human Identification, Human Intent Identification, and Decision Support

- Identify video, audio and linguistic-based features that are reliable in detecting deception, impostership, and hostile intentions
- Investigate how border agents and other border-related law enforcement personnel make decisions during the screening task
- Test alternative mechanisms for delivering real-time alerts of suspicious activity involving cargo, vehicles, or passengers



Project 2 - Cargo, Vehicle & Human Identification, Human Intent Identification, and Decision Support



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Project 4 – Sensor Networks and C³

- Identify technical specifications regarding bandwidth, power, resolution, and security required to run robust, reliable sensor networks in heterogeneous environments
- Identify the economic hurdles associated with implementing diverse sensor networks
- Determine how interoperability can be introduced between heterogeneous legacy systems and current-generation wireless systems
- Identify costs and benefits of interoperability

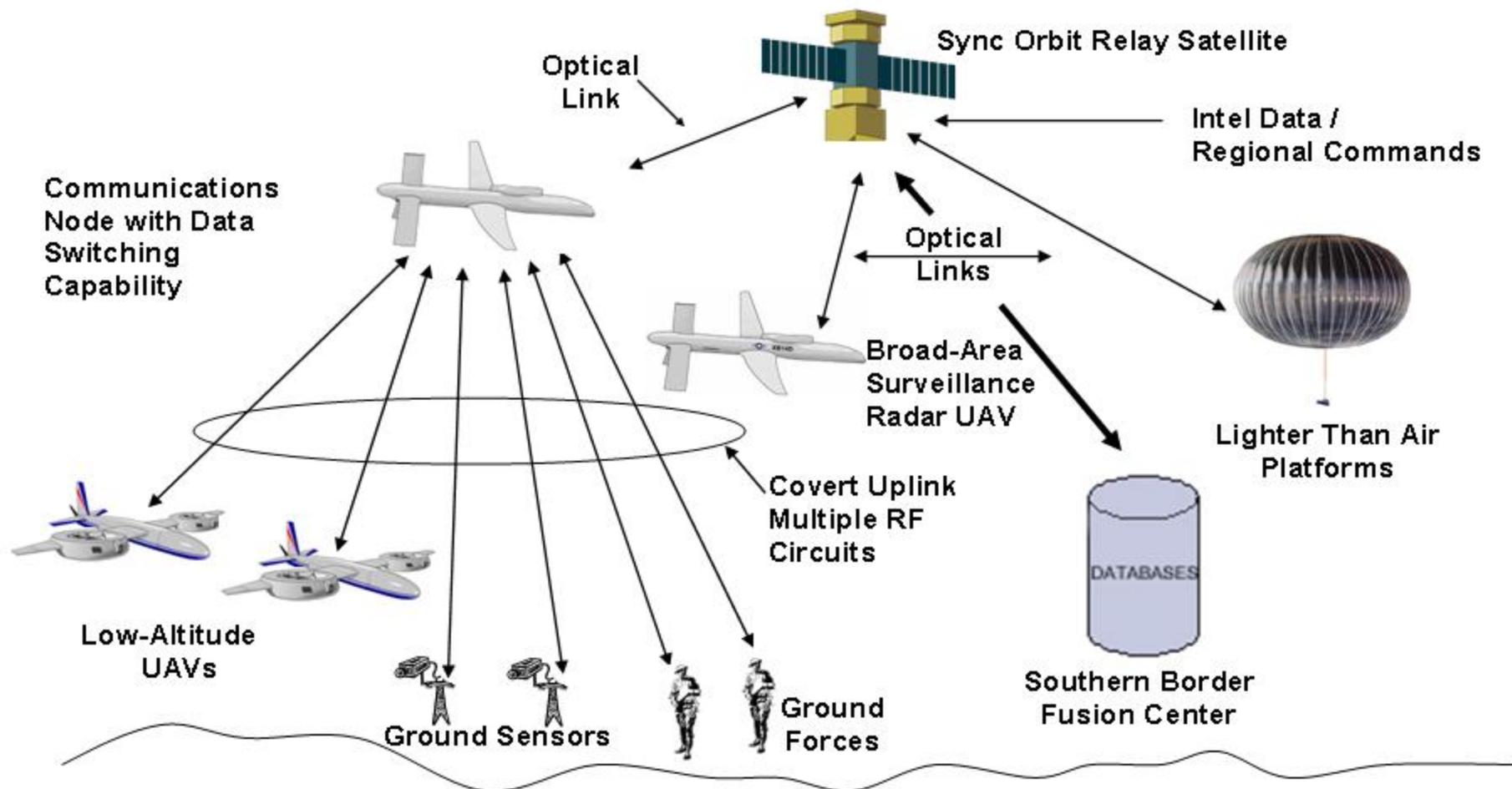


Project 4 – Sensor Networks and C³

- Conduct simulations, experiments and field tests for sensing and communication
- Test sensor networks along the southern and northern borders to test the feasibility of bi-national sensing of threats
- Conduct lab/field tests with VoIP technology to determine usefulness in border environment
- Conduct lab/field tests with diverse wireless systems



Regional Homeland Security: UAV Node Concept



- Attributes:**
- All entities: people, platforms, sensors are interconnected
 - All entities can pull data in real time
 - All entities have access (as appropriate) to relevant data at all times
 - All entities are part of the **Distributed Situation Awareness Network**

Project 5 – Tools & Approaches for Fusion of Data

- Identify the most effective methods of data fusion for reliable information extraction to support situational awareness
- Integrate swarms of sensors capable of reliable, low-cost detection of events
- Reconfigure sensor networks to respond to potential threats when insufficient information exists



Project 5 – Tools & Approaches for Fusion of Data

- Create a database of real, historical, heterogeneous data as a test bed for examining data fusion methods
- Conduct simulations and experiments to compare methods for data fusion, data mining, and knowledge extraction
- Examine the collection/fusion of sensor data via simulations and field tests at ports of entry



Project 6 – Risk Assessment and Mitigation

- Determine how fused sets of sensor and intelligence data can support decision makers' ability to assess threats and allocate resources
- Determine how multiple, potentially correlated threats can be coordinated, managed, tracked, and resolved
- Identify the best methods to support quantification of risk and risk mitigation



Project 6 – Risk Assessment and Mitigation

- Determine how the consequences and likelihood of occurrences can be effectively considered across many active threats
- Conduct experiments to test the most realistic methods of threat, vulnerabilities and response qualification
- Identify the risks of implementing technologically-sophisticated solutions within a specific social, political, economic, and administrative/operational context



Visualization of Risk



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Potential Immigration Projects – UNM Team

- Improve estimates of U.S. unauthorized population
- Assessing and estimate visa overstay population
- Examine Central American gangs as a proxy for third-country nationals promoting violence
- Establish law enforcement collaborations to identify, investigate, and prosecute criminal aliens
- Collect Mexican consulate data on applicants
- Mexican enforcement policies with Guatemala
- U.S.-Mexico cooperation on transborder security



Potential Immigration Projects – UTEP Team

- Multi-agency coordination and review
- Unconventional security assessments
- Migrant population flows and determinants

