SENTRY: Soft Target Engineering to Neutralize the Threat Reality

A DEPARTMENT OF HOMELAND SECURITY CENTER OF EXCELLENCE LED BY NORTHEASTERN UNIVERSITY

Our Research

SENTRY's research structure ties the technical challenges of protecting soft targets and crowded places (STCPs) to four fundamental research areas, culminating in our vision of the **Virtual Sentry Framework** (VSF). The Framework aims to provide real-time decision support systems enabling actionable situational awareness leading to more effective threat assessment, preparedness, mitigation, and response for STCPs.

Fundamental Research Areas

Programs

Real-Time Management of Threat Detection and Mitigation

- *Real-Time Management of Adaptive Surveillance and Mitigation*
- *Real-Time Video Surveillance for Threat Detection and Mitigation*
- *An Artificial Intelligence-Driven Threat Detection and Real-Time Visualization System in Crowded Places*
- *End-to-End Graph-Agnostic Real-Time Evacuation Routing to Protect Soft Targets During Active-Shooter Scenarios*

Advanced Sensing Technologies for Threat Awareness

- *Multi-Sensor Threat Assessment Platforms: Digital Dog Nose*
- *Multi-Sensor Threat Assessment Platforms: Mid-Infrared Laser-Based Sensors*
- *Radar Stand-Off Detection of Concealed Threats on Moving People*
- *Protection of Soft Targets and Crowded Places Using Aerial/Ground Agents*

Threat Risk Assessment, Prediction, and Deterrence

- *Machine Intelligence for Effective Threat Deterrence and Risk Mitigation at Soft Targets and Crowded Places*
- *Protecting Soft Targets: a Game-Theoretic Framework for Multitarget, Multi-Layer Defense Against Strategic Attackers*
- *Modeling and Behavior Analysis to Assess Public Space Safety and Protect Soft Targets against Active Shooter Attacks*

Layered Security Architectural Design and Simulation

- *Architectural Design Research: Integrating Security in the Public Realm*
- *Dynamic Digital Twins for Secure and Smart Civic Space*
- *Real-Time Crowd and Attacker Forecasting for Risk Assessment and Threat Mitigation*
- *Impact of Architectural Design on Emergency Behavior and Response During Active Shooter Incidents*

Venue-Specific Solutions

SENTRY has initiated a series of case studies to gain a deeper understanding of the unique security requirements of specific soft target venues. These case studies will evolve to encompass a wide range of locations, including schools, passenger-based surface transportation, sports arenas, places of worship, outdoor events, and retail facilities. By directly engaging and partnering with security stakeholders in each venue type, researchers aim to develop informed, pragmatic solutions as a part of the VSF.

Current Case Studies

School Security: Aims to create effective solutions and technologies to support a safe learning-conducive environment in schools.

Passenger-Based Surface Transportation: Focused on improving security measures in transit systems to enhance passenger safety and infrastructure resilience.

Stadium Security: Informing SENTRY researchers of ways to enhance the security and related guest experience of stadium venues while maintaining a welcoming environment.

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Join SENTRY in Advancing Security

Join SENTRY in transforming security and protecting soft targets and crowded places. Get in touch to learn about opportunities for collaboration with ongoing research and case studies.

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SENTRY Research

SENTRY research unites technical solutions for safeguarding STCPs through key research areas, fostering ongoing collaboration with stakeholders to advance development of the VSF. *Scan to learn more about ongoing research.*

Industry Partners

Leaders and experts in their fields, who provide guidance and introduce cutting-edge technology to augment SENTRY research and expedite the transition of solutions. *Scan for a complete list of SENTRY Industry Partners.*

Academic Partners

A diverse network of students and faculty, who engage with ongoing research, expand knowledge and scope, and contribute to the center's success. *Scan for a complete list of SENTRY Partner Institutions.*

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