



Personalized Weapons
Technology Project

NJIT



NJIT is a Public Research University

Biometrics

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Briefing Outline

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Objectives

To investigate Biometrics for Small Arms Weapons

- Dynamic Grip Recognition
- Pressure Sensor Technology

Background

New Jersey Institute of Technology

- Personalized Weapon Technology Project
- Memorandum of Understanding

Background

- July 2000 – ARDEC Technical Director Signs Memorandum Of Understanding With The New Jersey Institute Of Technology (NJIT)



NJIT/ARDEC MOU

Purpose:

- Collaboration in the research and development of smart gun technologies for military and civilian application
- Shared use of research and test facilities
- Joint pursuit of smart gun technology transfer between government, academic and private sector organizations

Working Definition of Personalized Weapon:

A A firearm whose capability to be fired is biometrically, mechanically, or otherwise safely rendered “authorized” user and/or users-only operational

The Stakeholders

- Law Enforcement
- Civil Community
- Military?



NJIT Project Plan

- Phase 1 - Literature Search
- Phase 2 - Tech Selection
and Evaluation
- Phase 3 - Prototype Modeling/Fabrication
- Phase 4 - Prototype Simulation/Evaluation

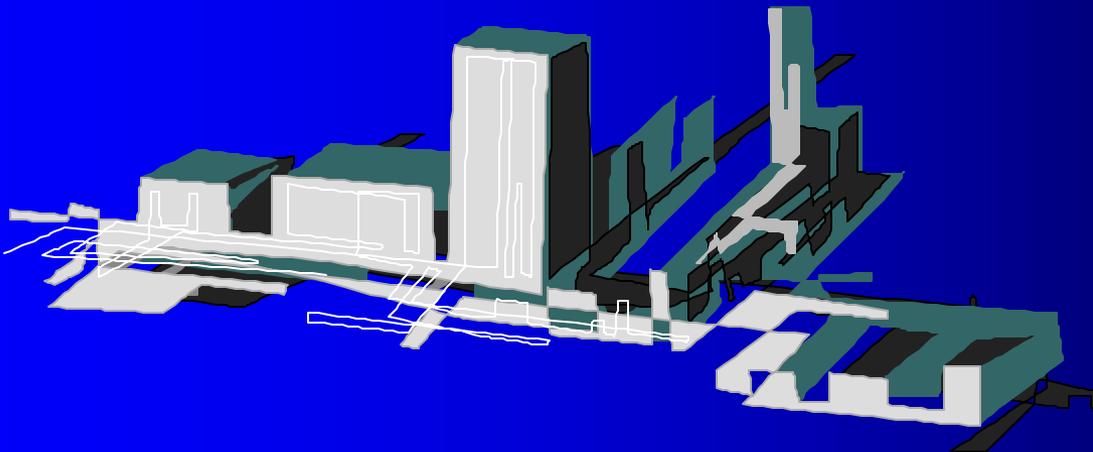


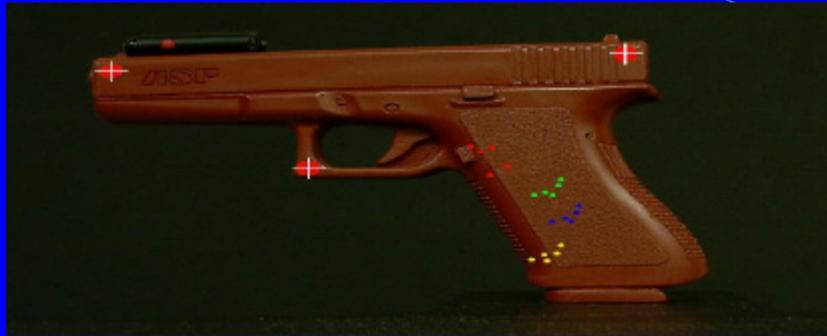
Initial Technologies Reviewed

- Radio Frequency Tags
- Remote Control
- Touch Memory
- Lock Systems
- Biometrics I.D./Recognition

Initial Technologies Reviewed (continued)

- Voice
- Fingerprint
- Grip Pattern

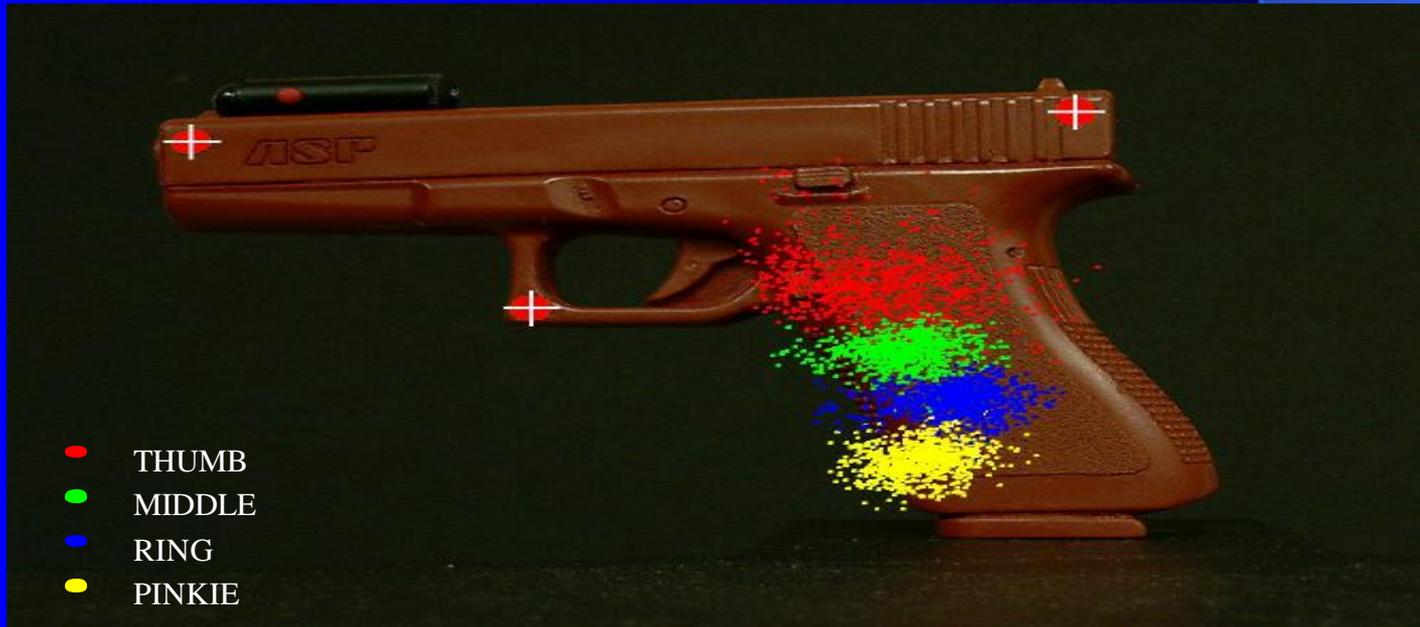




(a)



(b)



- THUMB
- MIDDLE
- RING
- PINKIE



Approach

Collaboration in Research between NJIT and CCAC

- NJIT - Dynamic Grip Recognition
 - Pressure Sensor Technology
- CCAC - Weaponization Expertise
 - Recognition on a Weapon
 - Test Vehicle
 - Compact, 9mm, Pistol
 - Effects of Benign and Stressful Environments
 - Include Live Fire Testing
 - Approaches for Impairment of the Weapon Function

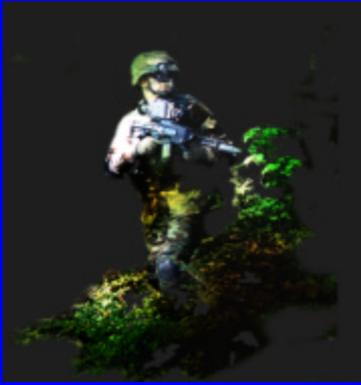
Assessment of Risk

- Repeatability of Recognition
 - Benign and Stressful Environment
- Reliability of the Recognition Grip Pattern Sensors
 - Benign and Stressful Environment

Scientific Challenge

Using Biometrics as I.D. Recognition - User Only Operational

- Reliability of Recognition
 - Benign and Stressful Environment
- How can the firearm architecture be best impaired
- Transparency to the operator
- Affordable



Relevance to the Army

Firearm capability is biometrically rendered
“Authorized” user(s) only operational

This technology can be applied to other items where a
“lock and key” system is currently being used.

No longer will a military item not function because a
password is forgotten or a key is lost in the heat of battle.

Execution Plan

- Identify Interfaces - Start with Design of Interface - Initiated
- Pressure Sensor Technology - Complete Design of Interface
- Incorporate “Dynamic Grip Recognition” into Weapon
- Demonstration of Technology -
 - Benign Environment - July 2002
 - Stressed Environment - September 2002

Metrics of Success

Quantitatively

- What is the recognition rate in both environments ?
- How reliable is it ?

Qualitatively

- Transparency to the operator
- Impairment to weapon function

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