Dr. Patrick Baker
Assessment and Analysis Campaign
U.S. Army Research Laboratory
Discover, innovate, and transition analytical sciences and assessment techniques for materiel and combat development, evaluation, and decisions making to increase readiness and ensure future Army overmatch.
• Assessment and analysis (A&A) are important to the Army and relevant to the broader community

• People, facilities, data, and challenging problems are available value streams

• Let’s Learn – Clear – Conceive – Collaborate

Listen and learn  Create some mental white space  Share and conceive an idea  Team and get it done
Why Does Your Army Care?

- Army partners rely on analyses and assessments linked to this campaign
  - Technical assessments support independent, objective evaluations
  - Quantitative threat-system effects for force-on-force assessments
  - Early assessment of innovations for risk-mitigation at much reduced cost
  - Feed analysis-of-alternatives to affect requirement definition for acquisition programs
  - Early and quantitative Human System Integration analysis for concept exploration, design, and acquisition.
- Develop and maintain a distinctive Army analysis capability

Major Accomplishment:
A&A has greatly improved conduct of Network Integration Evaluations
“Finally we must assess our efforts and continuously be prepared to adapt to unexpected opportunities and unanticipated dangers.”

GEN David G. Perkins
Commanding General U.S Army
TRADOC
ARL People and Expertise

ARL has over 250 experts engaged in experimentation, methodology development, and analytical science in:

- Ballistics
- Injury biomechanics
- Electronic warfare
- Electro-optics
- Cyber security
- Human performance assessment
- Complex systems

S&E EDUCATION

- PhD: 7%
- MS: 45%
- BS: 48%
Primary locations of ARL Analysis and Assessment are:

- Adelphi Laboratory Center, Maryland
- Orlando, Florida
- Aberdeen Proving Ground, Maryland
- White Sands Missile Range, New Mexico

Potential to leverage other sites for collaboration.
Example Facilities

- Aviation
- Ballistics
- Cyber security
- Electronic Warfare
- Optics
- Human Assessment

Ballistic experimentation facility for personal protective equipment

Electromagnetic Vulnerability Assessment Facility

Electro-Optical Vulnerability Assessment Facility

1 National Academy of Sciences, 2011–2012 Assessment of the Army Research Laboratory
UNDERSTANDING AND IMPROVING SOLDIER PROTECTION THROUGH ENHANCED ASSESSMENT AND ANALYSIS OF:

Weapons effects against material and personnel

Fundamental mechanisms of human injury in military threat environments

Approaches for rapid, reliable assessment of material damage and residual capability

Innovation to drive design, evaluation, and fielding decisions for new capability
UNDERSTANDING AND IMPROVING SOLDIER PROTECTION THROUGH ENHANCED ASSESSMENT AND ANALYSIS OF:
Sensors, electronics, communications and networks in a complex electromagnetic environment

- Hardening of optical and electromagnetic systems
- Assessments of military and commercial hardware in complex environments
- Robust models for EM propagation in complex environments
• Combining university research with controlled events in extreme environments
• Joint analytical software creation and assessment
• Early assessment of commercial technology during development
• Equipment manufacturers using our experimental facilities
A&A Collaboration Opportunities

**Assessment of Science and Technology**

- Augmenting Threat Analysis Capabilities Using Intelligent Threat Agents

**Science and Technology of Assessment**

- Developing a Tool to Predict Ammunition Compartment Survivability
- Uncertainty Quantification in Vulnerability Modeling
- VSL: Massively Parallel, Interactive, Cognition-Driven Analysis

**Systems Capable to Assess Mission**

- Systems-of-Systems Analysis (SoSA)
- Kill Assessment for Ballistic Missile Intercepts

**Virtual Facility Tours**

- Virtual Facility Tour of EF10 and EF20
- Virtual Facility Tour of Aviation Facilities

All Posters are located on the second floor of Mallette, Rm. 17 and 18
Assessing Mission Capability of Systems

- Applying Survivability Analysis to Body Armor Decisions
- Improving the Evaluation of Behind-Armor Blunt Trauma
- Understanding Military-relevant Injury Mechanisms
- Military Injury Research to Evaluate Human Vulnerability in Combat
- Vulnerability Modeling for Specific Human Morphologies
- Computed Tomography Analysis For Ballistic Research Applications
- Ballistic Vulnerability Reduction: Helicopter Rotor Blades
- Thermal & Toxic-Fume Hazards: Lithium Ion Batteries
- Under-body Blast Methodology Development and Validation
- Methodologies for Aviation Systems V/L Analyses
- GPS Measurements and Capabilities
- Radio Frequency Communication Survivability Development
- Electro-Optical Sensing Systems
- Laser Vulnerability of Optical Systems
- Advanced Electromagnetic Measurements
- Remote Sensing of Physiological Signatures
- Characterizing Task Performance of Injured Soldiers
- Representing a Distribution of Human Anatomies for Soldier Survivability
- Component Performance and Vulnerability: Propulsion and Drive Train

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• Let’s Learn – Clear – Conceive – Collaborate

QUESTIONS?