Defense Technology Symposium in conjunction with the AUSA Warfighter Summit & Exposition July 26, 2022 * Fayetteville, NC

Defense Technology Symposium

Session – Government Innovation Initiatives

Colonel (Ret) Denny Lewis, Director, North Carolina Defense Technology Transition Office (DEFTECH)

> Art Trevethan, Director of Corporate Ventures, Army Applications Lab (AAL)

Lieutenant Colonel Glenn McCartan, Defense Innovation Unit (DIU)

Captain Lauren Hansen-Armendariz, Chief Technology Officer, XVIII Airborne Corps Technology Office

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ARMY APPLICATIONS LABORATORY // Deftech

7.26.2022

Mission and Purpose

AAL **accelerates** technology into the hands of warfighters by **informing** requirements, **advancing** effective approaches to innovation, and making the Army a **trusted partner** for the commercial technology ecosystem.

- **Support the AFC mission** by informing requirements, transitioning MVP solutions to PMs and Labs, and teaming small/non-traditional businesses with larger DoD-focused businesses.
- Steer strategic investments by streamlining processes, increasing the accuracy of investment, and aligning pathways for transition.
- **Promote innovation best practices** by developing DoD problem solving teams and integrating an expanding pool of best-in-breed commercial solvers.



AAL ACTIVITIES

INTEGRATED SOLUTION DEVELOPMENT

Develop & Transition MVP Solutions to the Army

Inform Requirements

Link Small & Non-Traditional with larger DoD-focused businesses.

Build Stakeholder Teams

Embed Solvers with End Users

INNOVATION NETWORK DEVELOPMENT

Warfighter Integration: Inception to Solution

High Quality Industry Engagement & Events

Focus DoD Innovation on Army Priorities

National Lab Outreach

Orient Private and Public Investment

TECH/COMMERCIAL RECONNAISSANCE

Focused Commercial Analysis

Focused Tech Analysis

Solver Database

Aggregator Targeting

Small Business & Non-Traditional Validation

EVOLVE BUSINESS PRACTICES

End-user Driven Design

Stakeholder Alignment

Transition Pathway Integration

Cohort Methodology

SBIR Best Practices

Remove Barriers of Entry to DoD

Multifunctional Stakeholder Teams



Identify pain points, frame problems

Align pathways

Find solutions to current needs

Accelerate tech development

Enable multiple transition options

Innovation Lines of Effort

Tactical Power + Energy

Tactical AI + Unmanned Systems

Human Performance + Readiness

Contested Logistics

Emerging Opportunities



Joint Partnerships





DARPA

AAL Project Metrics

Technology Transitions & Divestments

34 over the next 24 months

Breaking ground on important innovation then transferring responsibility after achieving TRL6+, or divesting early and cheap **Immersive Soldier Touchpoints**



Curating problems through immersion, with Soldier perspective and small business imagination at the forefront

AAL aligns stakeholders and builds a Community of Action around Soldier perspectives to solve problems associated with critical components of disruptive technology



ARMY APPLICATIONS LABO<u>RATORY</u>

Art Trevethan Corporate Ventures ART@AAL.Army Http://AAL.Army

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North Carolina Defense Technology Transition (DEFTECH) July 2022

LtCol Glenn McCartan USMC Defense Engagement Team

TECH DOMINANCE IS THE NEW GLOBAL BATTLEGROUND

"Success no longer goes to the country that develops a new technology first, but rather to the one that better integrates it and adapts its way of fighting."

2018 National Defense Strategy

Game Changing Technologies

- Al
- Quantum
- Hypersonics
- Cyber

• Biotechnology

CHINA

MALAYSIA

- 5G
- Space
 - Autonomy



- PLR RRMY Theater Army HQ
- PLA AIR FORCE
 H
 Theater Air Force HQ
- PLA ROCKET FORCE







20₇₃ 20₇₆ 20₇₆

DIU is a fast-moving, cross-DoD organization focused exclusively on commercial companies to solve national security problems.

Elements of our Mission

Key Differentiators

Accelerate DoD adoption of commercial technology

Transform Military capacity and capabilities

Strengthen the national security innovation base

Unique project lifecycle from curation to transition

Joint force & mandate to scale value across DoD

Broad and deep integration into key tech ecosystems





• Liaison with DoD partner

TECHNOLOGY FOCUS AREAS

Where the Commercial Sector is in the Lead



BROADER, STRONGER NATIONAL SECURITY INNOVATION BASE

3,400+ companies in 47 states & DC applied



INCREASING ADOPTION OF COMMERCIAL TECH & GROWING THE NSIB 3 COMPONENTS OF DIU



DIU SUPPORTS YOUR PROGRAM GOALS



DIU executes projects with you to field relevant, scalable technology for warfighters across DoD.

Start a new project —or—participate in an ongoing project:

COST-EFFICIENT	 Cost Sharing Model: multiple DoD partners can participate in a single project DIU has no overhead fees Rapid obligation of funding and multiple colors of money accepted Vendors are only paid if they perform to milestones
SPEED	 Goal of 60-90 days from solicitation closure to contract award Flexible terms and conditions (especially IP) to reduce negotiation time Transition directly to sole-source production with no recompete process
IMPACT	 Access to non-traditional and start-up companies: best in each industry You design Prototype Milestones to achieve program objectives Multiple program needs can be addressed in a single problem statement

DIU COMMERCIAL SOLUTIONS CATALOG

Posted 49 transitioned or successfully completed solutions.



https://www.diu.mil/solutions/portfolio/catalog

Transitions Deliver Capability to the Warfighters:

- 1. Prototype successfully completed, and
- 2. Results in a production or service contract with DoD or U.S. Government, **and**
- 3. Budget in place to field a solution in an operational environment supporting warfighters.

With our DoD partners, we have evaluated, adapted, and tested commercial solutions to address their needs.

CONTACT US

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WORK WITH US

diu.mil



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XVIII AIRBORNE CORPS INNOVATION





TRANSFORMATION STARTS WITH







SOLDIERS



WHAT'S POSSIBLE SOLDIER INNOVATION CENTERS



Electromagnetic Warfare Training Aid



Soldier Assistive Bionic Exosuit for Resupply



Assistant Gunner (AG) Bag







Laser Mount for Landing Zone Assessments

Solution Opportunities

Evidence-driven requirements for emerging solutions:

- Nano-engineered aluminum powder power generator for tactical edge energy
- Low-cost emitters for tactical deception at the Battalion level or below
- ✓ Sensor to determine EW footprint at the Battalion or Brigade level



Education

150+ Soldier participation in innovation courses

- ✓ Inform capability development through comprehensive evidence
- ✓ Identify opportunities and obstacles for innovation
- ✓ Lean problem-solving



XVIII AIRBORNE CORPS

INNOVATION PROGRAMS AND PARTNERSHIPS





WHERE WE'RE GOING



Defense Technology Symposium

Session – Government Innovation Initiatives Business Briefs

JPS

Greenhill Antiballistics

Small World Sciences, LLC



JPS Jessica Urso 919.865.1141 Jessica.urso@jps.com

<u>Problem</u>

Technology name, picture, and brief description:

- IronGate®
- Purpose-built SCADA Security. IronGate eradicates cyber attacks with a proven, innovative, and cost-effective architecture.

What problem do you solve?



IRONGATE

Remote SCADA – a vital part of Critical Infrastructure – is a high value target for hackers who can disrupt entire societies from a distance. In fact, recent research indicates that Industrial Control System (ICS) vulnerabilities have increased by 41% in the first half of 2021. <u>Phil Muncaster UK / EMEA News</u> Reporter, Infosecurity Magazine A Third of Industrial Control Systems Attacked in H1 2021. <u>www.infosecurity-magazine.com/news/third-industrial-control-systems/</u>

Impact and Technical Approach

Technology Readiness Level (TRL)

TRL: IronGate and the IronGate Edge devices have been deployed and beta tested in an operational environment, at a water facility on a major U.S. military base. Results demonstrated that IronGate protected the SCADA network from hacking attacks that had been able to bypass existing security measure

What is the Impact of your Solution?

The IronGate system does not rely on standard networking methods for communication with SCADA equipment, nor does it rely on standard network security methods. IronGate is a purpose-built computing appliance with a custom Hardened Ethernet Interface (HEI) that is the system's only connection to the Internet. The IronGate HEI is not a standard Ethernet Interface. It does not support any standard protocols: SSH, FTP, TFTP, RTP, SQL, VPN, RDP, or SNMP. The IronGate HEI requires and supports only one protocol. This protocol is secure, encrypted, custom, and is used nowhere else in the world.

Solution Specifics

How do you solve the problem?

Until now, technologies to protect IP-based SCADA communications have been expensive and only lessen, rather than eliminate, vulnerability to attack. IronGate stands out by using tamper-proof hardware with a sophisticated combination of unique software protocols that prevent hacking.

•With IronGate, a company's network is not extended to the remote sites, removing additional potential security breach points

 The hardware design itself is secure; physical possession of Irongate Edge units does not expose any vulnerabilities

Performance

End-user payoff/expected operational value/new capability:

- IronGate provides improved security at only a fraction of the price of existing security methods
- IronGate carries out all communication with SCADA sensors and controls. Users do not need to learn the many different protocols and control methodologies prevalent in the industry

Dual-Use (Commercial / Military) applications for the technology solution:

 Although security may be enhanced, any military installation relies on the same types of infrastructure as do all communities. These are vulnerabilities that must be protected.

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FDP[™]: Protection against Brain Damage (TBI) and Behind Armor Blunt Trauma (BABT)



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Greenhill Antiballistics

Small World Sciences, LLC



Improved Cooling Textiles

Small World Sciences LLC Don Chernoff, President <u>donchernoff@gmail.com</u> 571-251-6162

Problem

Heat stress is a large heath risk and expense for the D.O.D. Health impacts from heat have already cost the military nearly \$1 billion between 2008 and 2018.

Technology and brief description:

We are developing synthetic fibers that reflect solar infrared heat and allow more body heat to escape to the atmosphere.

What problem do you solve?

Our fibers/textiles will reduce heat stress and keep people up to 10 degrees C cooler than existing textiles, even under high humidity.

How do you solve the problem?

Partnering with NC State University to develop fibers/textiles with infrared (heat) reflective and emissive properties based on biomimicry of the Saharan Silver Ant, which evolved to survive in extreme desert conditions. This unique concept has been scientifically validated through an NSF funded project at Columbia University,

Solution Specifics



Impact and Technical Approach

Technology Readiness Level (TRL) TRL: 3

What is the Impact of your Solution?

It will allow for the manufacture of textiles for clothing, tents, sun shades, etc... to reduce solar heat load on soldiers, improve health and wellness by reducing heat stress and reducing heat related injuries and deaths.

Awards

Winner of the most innovative solution award from the Department of Homeland Security 2022 Cooling Solutions Challenge for national climate resilience.

Performance

End-user payoff/expected operational value/new capability:

Improved health and performance, fewer injuries and deaths from heat, saving energy on air conditioning, help people adapt to climate change at work and at play.

Dual-Use (Commercial / Military) applications for the technology:

This technology will find wide adoption in sportswear and work clothing for anyone working or exerting themselves in hot weather. It may also be used for temporary structures to protect the homeless and refugees, and may find use in roofing and window materials to keep buildings cooler and reduce the need for air conditioning.