

Topic: N181-026

BGI LLC

Data Science Driven Aircrew Performance Measurement and Proficiency System

Aircrew Performance Assessment (APA) measures proficiency and quantifies readiness, allowing trending and assessments across the effects chain. Applying operational expertise, data science, and software engineering, APA is an innovative solution for evidence-based training to improve instructor efficiency and training quality. A Dynamic Performance Assessment Model (DPAM) provides tools for performance measurements and effects chain construction. DPAM is integrated as an extension of PMA-205's Next Generation Threat System's (NGTS) Analysis and Report Tool (ART), making it available in a variety of training systems. Human in the Loop (HITL) approaches reduce complexity of the implementation while limiting human input to objective aspects of the mission. BGI is an innovative veteran-owned business, merging the expertise of engineers, data scientists, and operational analysts to provide innovations to the warfighter.

Technology Category Alignment:

Human Systems

Modeling and Simulation Technology

None

Contact:

Scott Powell

scott.powell@bgi-llc.com

(330) 374-77371188

<https://www.bgi-llc.com/>

SYSCOM: NAVAIR

Contract: N68335-19-C-0534



Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N68335-19-C-0534



Tech Talk: <https://youtu.be/Aq4fYjU35al>

Department of the Navy SBIR/STTR Transition Program

DISTRIBUTION STATEMENT A. Approved for public release. Distribution is unlimited.

NAVAIR 2020-850

Topic # N181-026

Data Science Driven Aircrew Performance Measurement and Proficiency System
BGI LLC

WHO

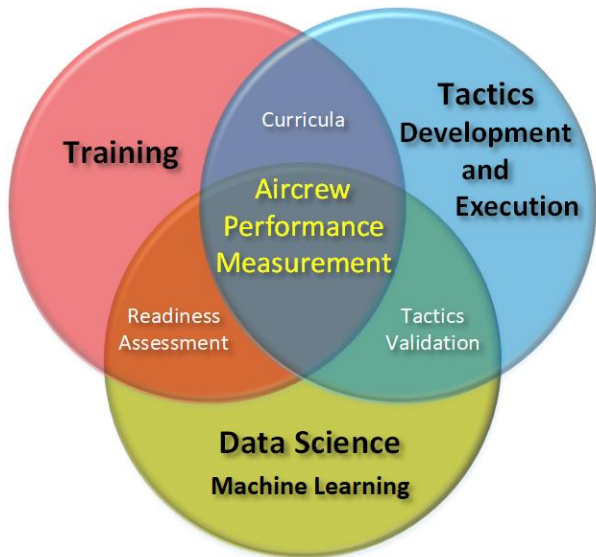
SYSCOM: NAVAIR

Sponsoring Program: PMA-298

Transition Target: PMA-205
Integrated Training Facility, NAS Fallon, via Next Generation Threat System (NGTS)

TPOC:
(407)380-4773

Other transition opportunities: Any structured training or operational environment that supports performance data collection, including live training ranges, virtual simulators, and Virtual Reality/Augmented Reality training environments.



Copyright, 2020, BGI, LLC

WHAT

Operational Need and Improvement: As a means to improve proactive decision making, Navy leadership has emphasized leveraging data-driven analytics which enable predictive solutions and aid in proficiency tracking. Assessing training performance is a critical domain where data science technology provides a means to increase the effectiveness, accuracy and efficiency of the debrief. Instructors are often challenged with not having enough time to conduct a rigorous and detailed evaluation of each flight, negatively affecting the quality of performance evaluations. Current practice is subjective and is hampered by a time-consuming process. An automated mechanism to pre-process and fuse multiple data sources for assessment and tracking of warfighting capabilities would alleviate this burden.

Specifications Required: 1) Data interfaces for consumption and processing of a range of disparate data sources used in LVC training systems
2) An architecture and process for linking available data sources to aircrew performance
3) Scalable functionality to support individual, team, and multi-team aircrew compositions and mission sets
4) An intuitive user interface to facilitate data synthesis by a human-in-the-loop and automated displays

Technology Developed: BGI's Aircrew Performance Assessment (APA) Tool measures aircrew performance and quantifies readiness, allowing trending and assessments across the effects chain. APA is an innovative solution for evidence-based training to improve instructor efficiency and training quality. A Dynamic Performance Assessment Model (DPAM) provides tools for performance measurements and kill chain construction. DPAM is integrated as an extension of PMA-205's Next Generation Threat System's (NGTS) Analysis and Reporting Tool (ART), available in many training systems. Human in the Loop (HITL) approaches reduce complexity while limiting human input to objective aspects of the mission.

Warfighter Value: APA processes large amounts of data to quickly generate reports highlighting the execution of Tactics, Techniques and Procedures (TTPs) to support instruction and remediation immediately following a training exercise. The algorithms used have been designed and reviewed by qualified instructors, and the software is extendable to new and updated missions and TTPs. Automated assessment minimizes subjective evaluation and provides consistent highlighting of key training points, based on approved doctrine, to develop more effective warfighters. Training effectiveness and return on training investments can be quantified via objective, evidence-based performance measurements.

WHEN

Contract Number: N68335-19-C-0534 Ending on: June 25, 2021

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Prototype complete; Air-to-Air (A/A) missions implemented	Low	Ability to support debrief of Offensive Counter Air and Defensive Counter Air training exercises	5	January 2021
Integration into NGTS baseline	Low	Completion of functional tests	6	January 2021
Air-to-Surface (A/S) missions implemented	Low	Ability to support debrief of A/S training exercises	6	June 2021
Integration into PMA-205 ITF	Med	Completion of acceptance testing	7	September 2021

HOW

Projected Business Model: BGI is an innovative, veteran-owned business, merging the expertise of engineers, data scientists, and operational analysts to best support the warfighter. While the APA tool is currently focused on a particular user community, the technology that underlies the functionality has much broader application. BGI is seeking additional users of structured training environments with measurable performance parameters, with whom to collaborate and apply this technology to optimize trainee readiness assessment and training effectiveness. It is particularly applicable to virtual or augmented reality training systems that provide a high degree of access to measure student actions and reactions to environmental stimuli.

BGI favors establishing partnerships with government customers and major prime contractors to continue to evolve technology over simple licensing of existing products.

Company Objectives: BGI has a demonstrated capability to collaborate with end-users to understand operational problems and then develop optimized tools to address them. BGI is seeking to extend the APA Tool into a comprehensive suite of tools that support not only assessment of trainee readiness, but also allow assessment and optimization of doctrine and application of advanced techniques, such as machine learning, to enhance knowledge via discovery of latent relationships and measures within critical effects chains.

Potential Commercial Applications: APA technology is equally applicable to commercial advanced training applications, including commercial aviation training, law enforcement tactical training, and medical training simulations. In each of these industries, BGI will target commercial companies that deliver training solutions requiring structured training environments with measurable performance parameters.