

Topic: N142-104

Visual Performance LLC

Effective Measures of Training Display System Performance

The Display Measurement Toolkit (DMT) is a portable multi-sensor measurement tool that can reduce time required for display acceptance testing from days to hours. Stable and objective metrics enable performance comparisons across training devices and programs, and reduce disagreements and delays in acquisition of training devices. The use of vetted standards increases the probability a training device supports warfighter needs. In addition to factory and final acceptance testing, the tool makes practical recurrent testing of fielded systems over their operational life. Visual Performance, LLC is engaged in engineering, research, development, specification, and test of advanced display and imaging systems. The president, Dr. Charles Lloyd is a systems engineer and applied vision scientist with 30-years-experience that includes prototype and proof-of-concept evaluations for managing development risk.

Technology Category Alignment:

Air Platforms

Autonomy

Electro-Optical/Infrared (EO/IR)

Modeling, Simulation & Test Infrastructure

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SYSCOM: NAVAIR

Contract: N68335-16-C-0183

 Corporate Brochure: https://navystp.com/vtm/open_file?type=brochure&id=N68335-16-C-0183

Department of the Navy SBIR/STTR Transition Program

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NAVAIR JSF17-907

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WHO

SYSCOM: NAVAIR

Sponsoring Program: Joint Strike Fighter

Transition Target: F-35 Flight Simulator Program

TPOC:
(407)380-8031

Other transition opportunities: F-16 Mission Training Center, F-18 Flight Simulator, P-8A Poseidon Multi-mission Maritime Aircraft (MMA) Flight Simulator, F/A-18 Tactical Operational Flight Trainer, F-22 Pilot Training Devices, US Army Aviation Combined Arms Tactical Trainer (AVCATT), KC-130 Flight Simulator



Courtesy U.S. Navy,

WHAT

Operational Need and Improvement: Navy acquisition engineers seek more objective and efficient measurement tools that will support the conduct of standardized tests for multi-channel simulation training display systems. Acceptance testing of these complex systems is currently performed by suppliers who often use manual, subjective, and time consuming methods that are applied subjectively across programs.

Specifications Required: The Display Measurement Toolkit (DMT) is compact and portable allowing it to be shipped from site to site and set up quickly in a training device. The DMT incorporates commercial off the shelf components (e.g., cameras, computer, etc.) to minimize cost and enable wide spread industry adoption. The metric definitions, test patterns, and measurement procedures developed for the DMT shall be published and subjected to stakeholder review. All DMTs shall be periodically calibrated against common standards so that they produce consistent results.

Technology Developed: Visual Performance's Display Measurement Toolkit (DMT) is a portable automated sensor package designed to measure multiple dimensions of complex multi-channel training display systems including resolution, geometry, luminance, contrast, uniformity, mirror distortions, and night vision goggle stimulation. A precision pan-tilt/camera/laser prototype has been tested and resolution, sampling artifact and geometry measurements have been demonstrated at a TRL-3 level. Five technical papers describing new metrics have been presented at industry conferences and the development of automated luminance, contrast, and uniformity measures has been initiated.

Warfighter Value: The adoption of standard Metrics, Test patterns, and Procedures (MTPs) simplifies the preparation of requirements and test plans because stakeholders can cite standards rather than rewrite this information for each contract. The use of stable and objective metrics enables performance comparisons across training devices and programs, and reduces disagreements and delays in the acquisition of training devices. The use of vetted standards increases the probability a display system will support the training needs of the warfighter.

WHEN

Contract Number: N68335-16-C-0183 **Ending on:** March 22, 2017

| Milestone | Risk Level | Measure of Success | Ending TRL | Date |
|--|------------|--------------------------------|------------|---------------|
| Laboratory test and demonstration of automated geometry measurement speed and accuracy | Med | 1000 X current speed | TRL-3 | August 2016 |
| Evaluation of prototype and automated resolution measurements at NAWCTSD laboratory | High | 12 X more precise, 14 X faster | TRL-3 | December 2016 |

HOW

Projected Business Model: Visual Performance expects to sell or lease DMTs to government clients and suppliers who want to collect their own display performance data and will provide measurement services for clients who elect to have measurements made by an independent party. Visual Performance will also license components of the DMT to customers who want to integrate these metrics into their own products.

Company Objectives: Visual Performance is seeking funding from programs in need of improved requirements and metrics for effectively managing the acquisition of simulation training devices with complex visual systems. The next steps anticipated for this effort include field test and demonstration of the metrics developed thus far, refinement of metrics and DMT components based on stakeholder feedback, and the development and testing of additional metrics that meet the needs of the acquisition community.

Potential Commercial Applications: The DMT can immediately benefit suppliers in the commercial flight training industry including Thales, CAE, and FlightSafety.

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