



# WARFIGHTER PERFORMANCE

Office of Naval Research, Code 34

## I/ITSEC 2023

### Mission

The Warfighter Performance department's mission is to enhance warfighter effectiveness and efficiencies through bioengineered and biorobotic systems, medical and behavioral technologies, improved manpower, personnel, and training and systems design.

### Vision

- Enhance individual and team decision-making, as well as combat effectiveness, by supplying the correct information to the right people with the required skills at the proper time in the right jobs
- Realize human-system efficiencies to enhance performance and reduce costs
- Create and deliver technologies inspired by biological systems
- Ensure the health and viability of our warfighters afloat and ashore



## Department Contact Information

Dr. Patrick Mason, SES  
Department Head  
Warfighter Performance  
[patrick.a.mason2.civ@us.navy.mil](mailto:patrick.a.mason2.civ@us.navy.mil)

Dr. Michael LaFiandra  
Division Director  
Code 341/342  
[michael.e.lafiandra.civ@us.navy.mil](mailto:michael.e.lafiandra.civ@us.navy.mil)

# WARFIGHTER PERFORMANCE

## Code 34 Divisions

### Human & Bioengineered Systems (Code 341)

#### Goals

- Sustained and improved warfighter performance and enhanced decision making in all environments through research and technology development for training and decision-centered design technologies
- Create options for future (perhaps unanticipated) naval decision-making, based upon fundamental understanding gained from cognitive sciences, neurosciences and social sciences and the application of emerging technologies
- Support integrated interdisciplinary research programs

#### Current Research Interests

ONR's Human and Bioengineered Systems Division seeks innovative proposals in basic research through applied research. Current research areas of interest include, but are not limited to:

- Cognitive sciences
- Computational neurosciences and bio-robotics
- Human factors, organizational design and applied decision-making research
- Social, cultural and behavioral modeling and mission-relevant case studies
- Cyber-social science and social cybersecurity
- Training, Education and Human Performance



### Warfighter Protection and Applications (Code 342)

#### Goals

- Increase the survival of casualties through immediate, life-saving treatment and stabilization
- Improve understanding of what causes injury and how to prevent it
- Prevent stress-induced injury and performance degradation in naval occupations and operationally-relevant environments
- Mitigate health and performance risks in undersea operations
- Utilize biology to expand Warfighter capabilities in the domains of biomaterials, biomanufacturing, bioenergy, bioelectronics and biosensors
- Develop the technology needed to increase the ability of expeditionary forces to utilize unmanned systems

#### Areas of Interest

The Warfighter Protection and Applications Division seeks technology solutions from a wide range of scientific and engineering disciplines including, but not limited to, biology, biomedical engineering, biotechnology, physiology, pharmacology, and computer and behavioral sciences. Science and technology programs and program pages are listed below.

- Basic Physiological Sciences
- Biotechnology for Naval Applications
- Expeditionary Robotics, Autonomic and Autonomy
- Marine Mammal Health
- Naval Force Health Protection
- Undersea Medicine and Performance



### Research Protections (Code 343)

The mission of the Research Protections Division is to ensure that human subject research supported by DON complies with federal regulations, DoD directives, and SECNAVINST 3900.39E CH-1. This includes all research involving human subjects conducted at DON systems and training commands, in operations forces, and at extramural institutions sponsored by the Navy.



# See us at I/ITSEC 2023

Visit our booth where we will be offering live demos of some of our research, with take-away media available for interested parties.

## **Cyber Simulation TRaining for Impacts to Kinetic Environment (CyberSTRIKE)**

Ms. Natalie Steinhauser (natalie.b.steinhauser.civ@us.navy.mil)

CyberSTRIKE produces simulated cyberspace and electronic warfare (EW) effects on shipboard command, control, communications, computers, and intelligence (C4I) interfaces connected to training environments such as the Navy Continuous Training Environment (NCTE). By altering information flow to shipboard C4I systems, CyberSTRIKE produces a range of realistic cyberspace effects on shipboard systems for command staff training. In our demonstration, we visualize the cyber effects created by CyberSTRIKE using the Battlespace Visualization and Interaction (BVI) system.

## **Fleet Adaptive Multilevel Measurement for Operations and Unit Systems (FAM2OUS)**

Ms. Natalie Steinhauser (natalie.b.steinhauser.civ@us.navy.mil)

Naval Aviation mission training is complex and relies on a lengthy and error prone process of evaluation where instructors must manually pull and synthesize data from disparate systems to conduct debriefs and assessments. FAM2OUS mitigates this by providing integrated collection, fusion, analysis, and archival capability for Live, Virtual, Constructive training and operational events across platforms to increase proficiency, readiness, and overall mission performance. FAM2OUS leverages the data rich training environment through a flexible ingestion engine and graph-based “crawler” system, which identifies meaningful data points and tags information with metadata to generate aircrew debrief reports.

## **Maintenance Tools for Operations and Training (MTOT)**

Dr. Peter Squire (peter.n.squire.civ@us.navy.mil)

MTOT is developing tools to address the lack or limited availability of equipment for maintenance training. Specifically, an immersive content generating capability, and guided troubleshooting and training solution to support schoolhouses and field use. These tools integrate with the Marine Corps learning ecosystem and generate adaptive training content in Learning Management Systems (LMS) such as Moodle. It adjusts the training content to student's performance. The solution uses learning standards such as xAPI (Experience API) to log analytics of student learning exercises to Learning Record Stores (LRSs), providing a standardized set of learning metrics and visualization capabilities. The exhibit will showcase a democratized pipeline for creation and deployment of web-based immersive and diagnostic maintenance training content in Moodle LMS, and metrics from Veracity LRS to support Adaptive Learning for students.

## **Navy Continuous Training Environment on Demand, Online (NCTEnDO)**

Ms. Natalie Steinhauser (natalie.b.steinhauser.civ@us.navy.mil)

NCTEnDO is an “On Demand” Live, Virtual, Constructive training (LVC) training methodology that was inspired by commercial online game portal technology that enables the U.S. Navy training audience to “pull” Fleet Synthetic Training (FST), 24/7, in port or at sea, vice training command “push” from the shore-based infrastructure. ONR is sponsoring an effort to develop an on-demand wargaming capability to facilitate mission rehearsal and fleet training while underway.

## **Project OMEN**

Dr. Rebecca L. Goolsby (rebecca.l.goolsby.civ@us.navy.mil)

ONR is developing new concepts of operation and affordances for combating disinformation, propaganda and malign information on social media and other Internet-mediated platforms. The information maneuver approach uses artificial intelligence, social networks theory and social science research to identify, characterize and analyze content and algorithms that mediate the flow of disinformation, propaganda and malign information contrary to US military mission narratives.

## **Studying the Relationship of Adaptive Training Exercises and Grades in the Classroom (STRATEGIC)**

Dr. Peter Squire (peter.n.squire.civ@us.navy.mil)

STRATEGIC is the student-centered science of learning techniques shown to improve learning outcomes in the laboratory applied to USMC training to meet 21st century learning goals. For the exhibit, STRATEGIC will be demonstrating adaptive flashcard tools such as Marine Adaptive Schoolhouse Training with E-Learning Repetition Technology (MASTERY), a Moodle-based plugin that enables course instructors to rapidly generate flashcard content and apply adaptive spacing algorithms that support efficient long-term retention. The Flexible Adaptive Sequencing for Training (FAST), a lightweight, excel-based testbed that enables researchers to adapt several aspects of flashcard-based instruction (e.g., adaptive sequencing, mastery, feedback, and difficulty) will also be demonstrated.



# WARFIGHTER PERFORMANCE

## Funding, Current and Future Opportunities

ONR is constantly looking for innovative scientific and technological solutions to address current and future Navy and Marine Corps requirements. We want to do business with educational institutions, nonprofit and for-profit organizations with ground-breaking ideas, pioneering scientific research and novel technology developments. The Warfighter Performance Department seeks proposals that create research, development, and acquisition options of potentially extraordinary value and is willing to consider high-risk projects having commensurate value.



Open Funding  
Opportunities

### Apply Now

#### **FY24 Long Range Broad Agency Announcement (BAA) for Navy and Marine Corps Science and Technology**

**Proposals Accepted until September 30, 2024 2:00 PM EST**

Visit the Code 341 and 342 Science and Technology Program websites to access more information regarding the specific goals, aims, research concentration areas, along with program contact information for each of our areas of interest.



BAA  
n00014-24-s-b001

### Future Opportunities

ONR offers special funding opportunities to address scientific innovation and unmet needs. Keep an eye out for some of our common opportunities offered each year:

#### **Defense University Research Instrumentation Program (DURIP)**

This mechanism enables research related education in areas of interest and priority to the DoD by providing funding to US institutions of higher education for the purchase of equipment and instrumentation.

#### **Historically Black Colleges and Universities/Minority Institutions**

This program aims to increase the quantity and quality of minority professionals in science, technology, engineering, and mathematics (STEM) in the defense community via a targeted funding mechanism to conduct research of DoD interest at Minority-Serving Institutions.

#### **Multidisciplinary University Research Instrument (MURI)**

This high-risk basic research mechanism attempts to understand or achieve something never done before. Produce significant scientific breakthroughs with far reaching consequences to the fields of science, economic growth, and revolutionary military technologies.

#### **Young Investigator Program (YIP)**

The Young Investigator Program seeks to identify and support academic scientists and engineers who are early in their career and show exceptional promise, seeking to conduct research of interest to ONR while fostering the next-generation of outstanding leaders.