

Topic: OSD10-HS3

## UtopiaCompression, Corporation

### Training Effectiveness Measurement Software

UtopiaCompression Corporation (UC) is a high-tech company providing innovative and mission relevant solutions to US Government Agencies and commercial markets. Skill mastery acquisition is essential to ensure better retention and improved on-the-job performance. In this Phase II Base, skill assessment software will be developed based on concept of “knowledge tracing” to estimate mastery achieved by trainees and to predict performance. Currently, this software is being used to identify training gaps in a valve-maintenance trainer called the Virtual Task Trainer (VTT) at the Surface Warfare Officers School (SWOS). In the Option phase, skill-tracking capability will be integrated with the VTT for real-time monitoring of an individual trainee’s skill mastery progression. Different features (batch learning, inference and online-learning algorithms) of the software are being developed and tested via ongoing ONR SBIR projects to drain out risk for ultimate transition and commercialization of this technology. By end of this Phase II Base and subsequent Option we expect to deliver the software at TRL = 5 and 7, respectively.

### Technology Category Alignment:

Personalized Assessment, Education, and Training

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**SYSCOM:** ONR

**Contract:** N68335-16-C-0334

 Corporate Brochure: [https://navystp.com/vtm/open\\_file?type=brochure&id=N68335-16-C-0334](https://navystp.com/vtm/open_file?type=brochure&id=N68335-16-C-0334)

Department of the Navy SBIR/STTR Transition Program

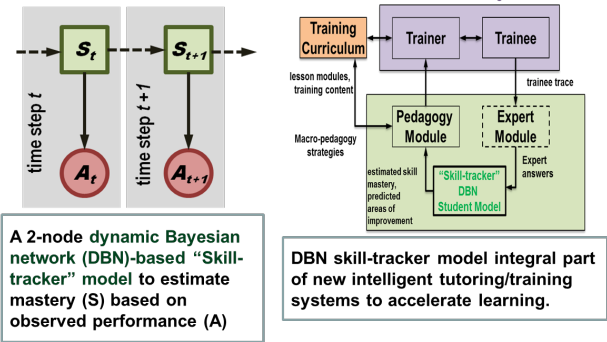
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ONR Approval #43-3252-17

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WHO

**SYSCOM:** ONR  
**Sponsoring Program:** Code 34  
Warfighter Performance Department  
**Transition Target:** Surface Warfare  
Officers School (SWOS)  
**TPOC:**  
Dr. Harold Hawkins  
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**Other transition opportunities:**  
Naval Education and Training  
Command (NETC), Center for  
Surface Combat Systems (CSCS),  
Naval Air Warfare Center Training  
Systems Division (NAWCTSD),  
Department of Homeland Security  
and First Responder standardized  
training.



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WHAT

**Operational Need and Improvement:** Training is an important activity for the US military when personnel are not engaged in military operations. However, under current methodologies, training of military personnel is expensive both in terms of dollars and personnel time to gain mastery/skill. With advances in immersive virtual environments due to improvements in artificial intelligence and graphics technology, the focus is on building high-fidelity and complex training systems that can train personnel on a host of situational awareness, decision-making and procedural tasks such as maintenance. With better front-end training systems the goal is to also leverage power of education technology to accelerate learning by a) identifying skill/knowledge gaps in individual personnel, and b) provide directed remediation, resulting in improved training throughput and fleet readiness.

**Specifications Required:** Skill-mastery prediction models must accelerate learning (reduce training time), foster better retention and transfer.

**Technology Developed:** Currently in Phase II Base, the goal is to deliver standalone software to track skill mastery of personnel training on Virtual Task Trainer (VTT). The software called "χiron (chi-ron)" is implemented in C# with prototyping using off-the-shelf software. As we advance into Phase II Option 1, hooks will be added to the software to integrate with the VTT for continuous and real-time assessment.

**Warfighter Value:** Effective training has a direct impact on improved unit and system readiness. Skill-tracking models are designed to track and predict skill mastery and decay across different training lessons designed to teach factual, conceptual, procedural, troubleshooting and decision-making tasks.

**WHEN** Contract Number: N68335-16-C-0334 Ending on: September 21, 2017

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Prototyping skill mastery models using off-the-shelf software	Low	Data collection and model development	3	June 2017
Developing standalone skill mastery tracking software in C++	Low	Extensively testing learning/inference algorithms	5	September 2017
Adding features to skill mastery software for integration with Virtual Task Trainer (VTT)	Low	Verification by SWOS IA/VTT SMEs	6	June 2018

HOW

**Projected Business Model:** The developed software can be integrated with multiple, complex training systems. UtopiaCompression Corp. will license the software to DoD end-users as well as to prime integrators. UC technical team will provide assistance for initial testing and integration of the "skill tracking" models with respective training systems.

**Company Objectives:** Our short-term goal is to transition the technology to multiple DoD customers and Prime contractors. Long-term goal is to enter the commercialization space for online and distance learning, massive online open classrooms (MOOCs) and immersive training.

**Potential Commercial Applications:** Includes (but not limited to) Learning management systems (LMS), Intelligent Training Systems for Skill development.

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