

Topic: N132-130

## enomalies

Rapid Synthetic Environment Tool for Virtual Battlespace 2 (VBS2)

Enomalies, LLC has developed an automatic scene analysis /reconstruction tool that is capable of utilizing legacy and advanced scanning technologies to interactively segment and detect similar objects to rapidly develop or update existing geospecific terrain databases – to include building interiors – to reflect changes or damage. The capability to depict interior layouts of buildings is particularly important as they are not typically available from DoD sources. This tool also eliminates the need for highly trained, dedicated teams to create advanced simulation and training models and allows instructors or trainees to build and import geospecific terrain data to tailor databases to reflect current conditions. Agnostic to scanning methods, the tool streamlines the process for developing databases for training or intelligence operations – saving time and money.

### Technology Category Alignment:

Unmanned Aircraft Systems (UAS)

Information Collection / Management

Personnel, Training, and Leader Development

Modeling, Simulation & Test Infrastructure

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SYSCOM: ONR

Contract: N00014-16-C-1001

 Corporate Brochure: [https://navystp.com/vtm/open\\_file?type=brochure&id=N00014-16-C-1001](https://navystp.com/vtm/open_file?type=brochure&id=N00014-16-C-1001)

# Department of the Navy SBIR/STTR Transition Program

STATEMENT A. Approved for public release; distribution is unlimited.

ONR Approval # 43-2203-16

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Rapid Synthetic Environment Tool for Virtual Battlespace 2 (VBS2)

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## WHO

**SYSCOM:** ONR

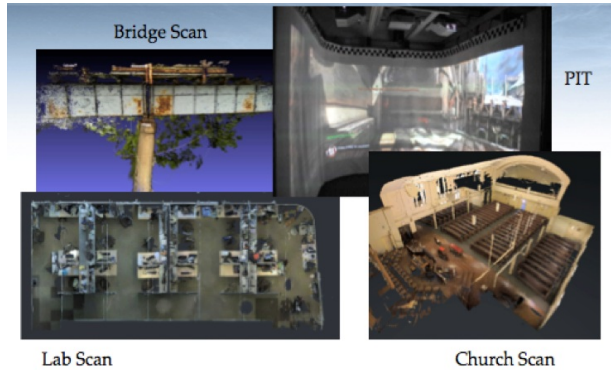
**Sponsoring Program:** Code 30

**Transition Target:** Marine Corps System Command, PM TRASYS

**TPOC:**

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**Other transition opportunities:** PM Armored Fighting Vehicles, PdD Future Fighting Vehicle PM Stryker Brigade Combat Team, PdM Stryker Future Operations



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## WHAT

**Operational Need and Improvement:** Develop tools for Marines and Sailors to produce and modify simulation terrain databases, including building interiors, using government or commercial geospatial data or other means; e.g. Light Detection and Ranging (LIDAR) systems

**Specifications Required:** A powerful tool to produce and modify simulation terrain databases for training and mission integration use: by Marines and Sailors with limited technical expertise. In addition to producing databases, the tool allows instructors and trainees to refine terrain databases to reflect specific needs or what they are experiencing on the ground. This is particularly important for the interior layouts of buildings, which typically are not available from DoD sources. In addition, buildings are often damaged or destroyed in military operations and the database should be able to rapidly reflect that.

**Technology Developed:** Our system takes data captured by 3D scanning methods as input and generates a hierarchical representation of the interior scene and a visually complete 3D model as the outcome. The implementation is based on a novel automatic algorithm to semantically decompose, analyze, and reconstruct detailed interior scenes and extract semantics. The resulting reconstruction is an approximation, which captures the general scene arrangement in a greatly reduced time, allowing for a more rapid integration into the training database.

**Warfighter Value:** Our software allows the warfighter to use COTS equipment to create 3D training databases for advanced simulation packages. They can use Drones, LIDAR, cameras, 3D scanners or structured light scanners to create these models. The advantage is it streamlines the pipeline for model delivery. Previously, dedicated teams of trained individuals were required to create these advanced simulation terrain models. With our method, a single user, with little training, and familiar equipment will rapidly create/deploy models for immediate training/intelligence use, creating a force multiplier, and reducing time/cost.

## WHEN

**Contract Number:** N00014-16-C-1001 **Ending on:** November 20, 2019

Milestone	Risk Level	Measure of Success	Ending TRL	Date
CDRL: A004 Demo of 1 multi-modal 3D camera prototype	Low	Successful Demo	4	October 2016
CDRL: A005 Demo of entire modeling pipeline on desktop PC	Low	Successful Demo	4	October 2016
CDRL: A006 Demo of cloud-based reconstruction system	Low	Successful Demo	6	May 2018
CDRL: A007 Demo of model import to VBS from other software packages or regular 3D models	Low	Successful Demo	7	November 2019
CDRL: A008 Demo of VBS2 simulation w/ customized content, running in PIT	Low	Successful Demo	7	November 2019

## HOW

**Projected Business Model:** We will require equity investment in the earlier stages to elevate the product to a high enough TRL level for a prime to be able to take it to distribution and get it in their hands in the field.

**Company Objectives:** To develop the software to a TRL6 and work with a prime for distribution.

**Potential Commercial Applications:** Department of Homeland and First Responders have the need to produce training environments as well as close to real time synthetic environments for command and control development. Commercially there are Gamers who develop map environments. Archaeologist need for preservation of fieldwork and excavations.

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