Background

One World Terrain (OWT) is a Joint Staff-funded project designed to assist the DoD in creating the most realistic, accurate and informative representations of the physical and non-physical landscape.

Part of the Army National Simulation Center’s Synthetic Training Environment (STE) concept, the goal was to help establish a next-generation government/industry terrain standard for modeling and simulation (M&S) hardware and software for training and operational use.

Objectives

The project’s original objectives were to construct a single 3D geospatial database for use in next-generation simulations and virtual environments; utilize commercial cloudfront solutions for storing and serving geospatial data; procedurally recreate 3D terrain using drones and other capturing equipment and reduce the cost and time for creating geo-specific datasets for M&S.

Results

To date, ICT has produced 3D terrains through the UAV collections of over a hundred different sites to support the terrain research efforts for US Army STTC.

Our technology is also an integral part of Army’s One World Server (OWS) system, which utilizes our semantic terrain processing algorithms for creating and processing simulation-ready high-resolution 3D terrain from low-altitude UAV collections.

ICT has delivered over 50 UAV capture kits with personnel training to various Army, Navy and Marine groups including 25th ID, West Point, 7th Special Forces, 82nd Airborne, AI2C, Fort Leavenworth, SFAB Unit, etc. This opens up 3D terrain collection and generation capabilities for these operational units.

Our support of the warfighter doesn’t stop with training – ICT R&D has been operationalized. In 2021, One World Terrain capabilities were used by the 86nd Airborne Division to enable the mass airlift from Kabul, Afghanistan.
Next Steps
For future research, we aim to address the current limitation of the photogrammetry process for creating 3D terrains. Specifically, we plan to develop the capability for photorealistic reconstruction and visualization of the geospatial terrain using neural rendering techniques.

Published academic research papers are available from https://ict.usc.edu/research/publications
(Search engine keyword: USC ICT Publications)

Project Leader: Andrew Feng
Established in 1999, the USC Institute for Creative Technologies (ICT) is a Department of Defense (DoD) University Affiliated Research Center (UARC), sponsored by the US Army. Harnessing Hollywood-derived creativity with academic innovation and military-domain expertise, ICT conducts award-winning R&D in Artificial Intelligence (AI), Computer Graphics, Geospatial Sciences, Human Performance, Learning Sciences, Modeling, Simulation & Gaming, Mixed Reality (MxR), Medical VR, Narrative, and Virtual Humans.