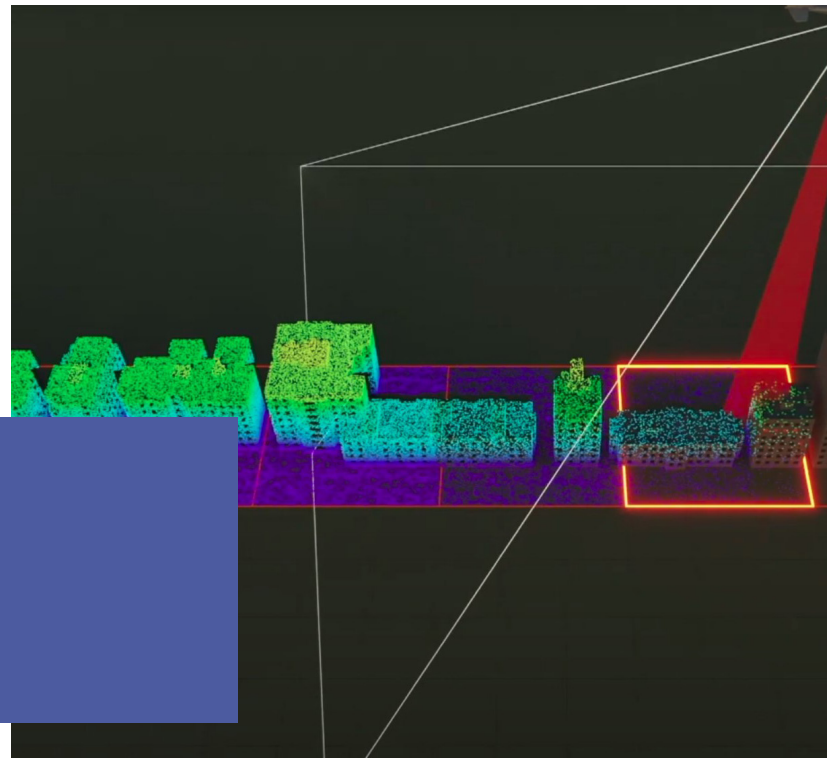




# 3DEO, Inc.®

3DEO is using Microway systems to rapidly process high-quality 3D LIDAR data for research funded by the U.S. Army Corp of Engineers.

## Powering Advanced LIDAR Solutions for Aerial Mapping



**Traditional aerial surveying is often pricey, slow, and limited, which has kept it out of reach for many industries. Enter 3DEO. Spun out from MIT Lincoln Laboratory, 3DEO has turned the game around, offering super-fast, efficient, and cutting-edge 3D aerial imaging systems. Using state-of-the-art Geiger-mode LIDAR tech, 3DEO captures detailed 3D surveys that set a new standard in detail. This game-changer helps industries like forestry, construction, and urban planning get the accurate, timely data they need to make smart decisions and streamline their operations. With technology initially developed for the military, 3DEO collects highly-detailed 3D LIDAR more rapidly than any other commercially available options. These high-resolution surveys are processed using Microway's advanced hardware solutions**

### KEY CHALLENGES

3DEO needed a computing solution capable of supporting the high ingest rate and extensive compute demands of real-time tracking. In a recent SBIR-funded development, 3DEO systems were used to monitor huge flocks of small birds and track each individual bird in 3D in real time. The raw LIDAR data streamed at 200-400 MB/sec into the processing system for conversion into raw 3D point clouds, then cluster detection, then tracking. Their specific computational challenge was to GPU accelerate their workload to analyze LIDAR field data in real time, which their previous systems could not handle.

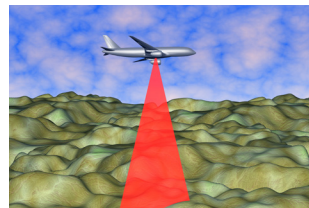
### THE DEPLOYMENT

#### ► MICROWAY WHISPERSTATION™

The WhisperStation configuration provided an ultra-quiet workstation platform for 3DEO's demanding application. Equipped with an Intel® Xeon® Processor and designed to cool multiple NVIDIA® GPUs, it is a powerful host for these workloads. The configuration also stays cool and quiet: it utilizes ultra-quiet fans, internal soundproofing, quiet heat-sinks, quiet power supply, and carefully selected chassis and cooling components.

#### ► NVIDIA RTX™ 6000 ADA GPUS

NVIDIA RTX 6000 Ada GPUs provide the compute and visualization engine to process and visualize 3D LIDAR data. They feature large GPU memory spaces with 48GB of GDDR6 memory, high single precision performance, and Fourth-Generation Tensor Cores for AI computation.



3DEO's LIDAR system is a powerhouse, using advanced Geiger-mode LIDAR to snap up 10-30 million 3D measurements per second with thousands of single-photon detectors working together. This means quicker, more efficient data collection from higher altitudes, covering larger areas with unmatched precision. Picture this: a system on a jet at 30,000 feet mapping a 3mi wide swath of land with 1-foot resolution.

That's some serious capability, enabling users to conduct thorough 3D surveys and gain deep insights into urban areas, forests, and more. The collected data transforms into precise 3D models, perfect for better planning, monitoring, and resource management. The 3DEO LIDAR engineers are involved in every step - from construction to the field - and ensure a hands-on approach that guarantees the highest quality results.

### 3DEO

3DEO is a hardware spin-out from MIT Lincoln Lab and innovator in the field of aerial LIDAR imaging. Trusted by the US DOD, DARPA, and the US Army, their expertise in Geiger-mode LIDAR tech delivers top-tier LIDAR solutions. Making advanced 3D data accessible and high-quality, 3DEO offers systems for high-resolution mapping and real-time monitoring, which empowers businesses and government agencies to boost efficiency and make well-informed decisions.

# Case Study

“... I'd tell a friend or colleague don't waste your time, just pick up the phone and give Microway a call. I guess I'm kind of sold. Sorry, but I'm a happy customer.”

- Dale Fried, Founder and CEO, 3DEO

## THE LAWRENCE CROW STUDY

The Lawrence Crow Study was a technology pilot funded by the U.S. Army Corps of Engineers. The study aimed to test new 3D imaging tech by tracking the flight trajectories of 1000s of crows in Lawrence, MA, New England's crow roost.

This predictable phenomenon of thousands of crows flocking to their nightly roost (a scene resembling a Hitchcock movie) was an ideal test case for 3DEO's advanced imaging technology. The goal was to measure the flight trajectories of each bird within the large flock and provide insights into their behavior and improve measures to avoid bird strikes with aircraft.

## RESULTS

3DEO adapted one of their airborne Geiger-mode LIDAR systems, which use light waves instead of radio waves, for this ground-based demo. It provided superior angular resolution to attack the problem. The system, affectionately named “Tweety,” captured detailed 3D images and real-time data, and was able to detect each crow as pinpoints on a 3D map.

With the new computing hardware in place, 3DEO was able to take the workstation with them into the field to achieve realtime tracking of the birds. Whisperstation's powerful capabilities enabled them to perform extensive data analysis and real-time decision-making in the field to improve their operational efficiency.

The Geiger-mode LIDAR system successfully tracked the crows, and provided valuable data on their flight trajectories. This technology demonstrated potential applications for avoiding bird strikes at airports and tracking drones, which highlighted 3DEO's contribution to innovative imaging solutions.

## THE PROCESS

3DEO turned to Microway based on a strong recommendation and past positive experiences. Years ago, the CEO of 3DEO successfully used Microway for a compute cluster and received substantial post-sale support that left a lasting impression. More recently, an IT business consultant, known for handling large-scale cloud migrations, strongly recommended Microway, reinforcing the CEO's decision.

- ▶ Microway architected a Whisperstation with dual NVIDIA GPUs and an Ubuntu Linux software stack tailored to handle the intensive computational demands of 3DEO's applications.
- ▶ Microway's solution not only offered the technical expertise 3DEO needed but also provided a seamless and supportive sales process, which was a key differentiator from competitors— including large OEMs.
- ▶ When 3DEO moved forward, their WhisperStation was custom-built in Microway's Plymouth, MA facility. The system was integrated with a Linux operating system and other open-source software.
- ▶ The system was fully functional upon delivery. This was critical for supporting 3DEO's field operations, which allowed them to login and immediately leverage the enhanced computational power to improve their data processing capability.



## ABOUT MICROWAY

Microway designs and builds hardware solutions for the intersection of AI and HPC. These include clusters, servers, and quiet workstations designed for bleeding-edge computational performance. Microway also delivers the data-planes that keep up with these advanced workloads—with a complete array of storage and network offerings.

Since 1982, customers have trusted Microway to design and deliver them unique and superior hardware—enabling them to remain at the forefront of supercomputing and solve the world's toughest challenges.

Microway's strategic partners include NVIDIA, Intel, AMD, DDN, and more. Classified as a small business, woman owned and operated, Microway's CSA Schedule is 47QTCA23D00AC

