



HUVIAIR TECHNOLOGIES

WHITE PAPER ON GIS BASED 3D DIGITIZATION OF PHYSICAL ASSETS

HUVIAIR
A  **BOEING** Company
HorizonX



DIGITIZATION

Digitization can be defined as creating digital versions of existing physical items.

An example would be creating a digital work order that was previously a paper work order.

This is not just going paperless but also creating digital copy that can be visualized, shared and edited. Cloud computing technology enables the digital items to be rapidly shared across multiple stakeholders, the access controlled so that few people with permission can make changes in the digital item.



GIS

A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data

GIS software have long worked towards digitization of maps and having relevant items on the maps to be digitally recorded.

An example will be an electric utility company creating GIS maps of power line supports in an area.





With the GIS map, the maintenance work can be streamlined. The utility workers would be able to search for, see, and route to particular supports to perform maintenance work on them. They would also have the data of to access the utility including if any private or unpaved road lead to the supports. Also the maintenance records can be maintained on the GIS system.



Today, we have the technology wherein the physical assets can be mapped in 3D that along with GIS can create digital physical replicas of all physical assets of an organization. The primary technologies that enable this are photogrammetry, high end cloud computing and computer vision.

PHOTOGRAMMETRY

Photogrammetry involves estimating the three-dimensional coordinates of points on an object employing measurements made in two or more photographic images taken from different positions.

Usually, for creating high resolution 3D digital assets, multiple images with high overlap percentage (70-80%) are captured and used for processing.

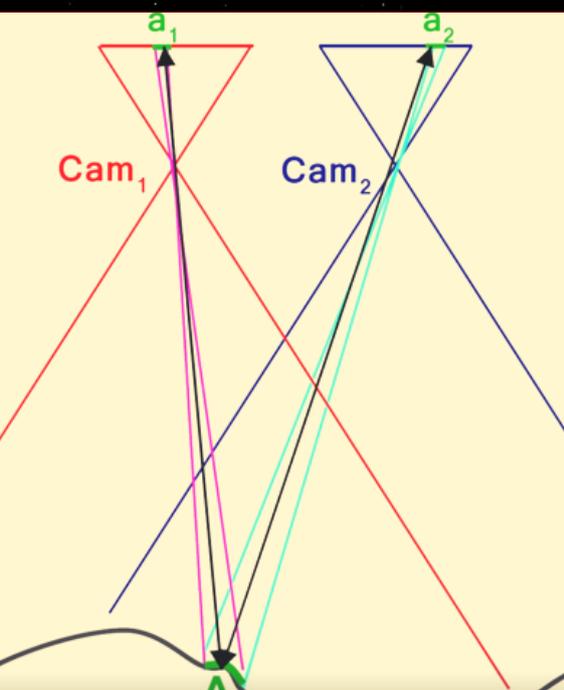


These images are further processed to convert them into point clouds.



POINT CLOUD

A point cloud is a set of data points in a three-dimensional coordinate system. These points are usually defined by X, Y, and Z coordinates, and are intended to represent the external surface of an object. Point clouds often contain thousands and millions of points.

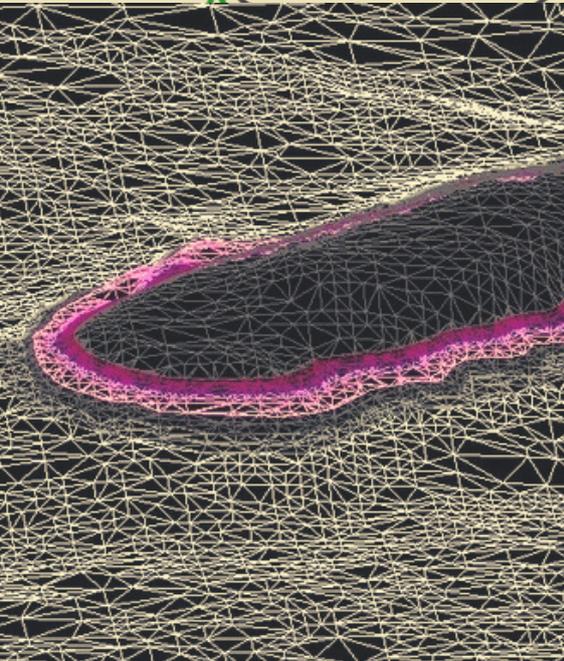


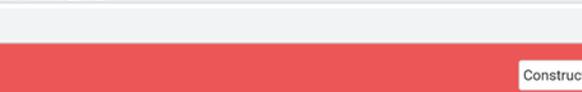
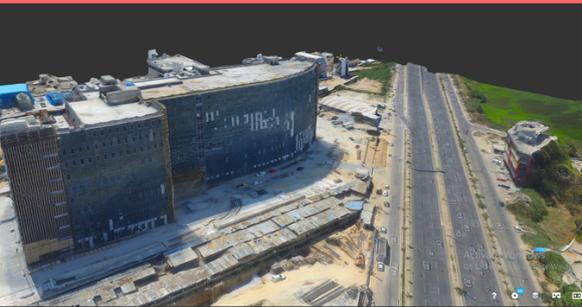
DATA COLLECTION

Real world spatial data collection is done using different sensors and carriers--
--Geo referenced RGB images from unmanned aerial vehicles(drones)
--Hand held or tripod mounted laser scanners

PROCESSING

The data collected is further processed using the photogrammetric techniques to generate the point cloud and further a 3D model. This is usually done on cloud software such as HUVIAiR as very high computing power is needed to process such data.





OUTPUTS

A sample 3D model of an under construction building can be visualized here-

<http://huviar.com/3dmodel.html>

These models accurately sit on the GIS base maps that can be visualized online from any device.

Accurate distance and area measurements can be performed on these.

ABOUT HUVIAIR

HUVIAiR Technologies is a drone data solutions company.

We have expertise in providing consulting, training, and drone data visualization and management solutions for the infrastructure, mining, smart cities and natural resource management sectors.