

CONCEPT 3D scanning is the process of collecting data of an environment or object and recreating it as a digital model using geometry, color and captured images.

BACKGROUND

A 3D scanner is a device that identifies, analyzes, collects and draws/displays shapes or three-dimensional models of real-world environments or solid objects. A 3-D scanner enables the capture of geometric shapes and the recreation of the physical appearance of tangible objects, allowing them to be built and displayed on a computer. The earliest digital 3D scanners in the 1980s used contact probes that physically touched an object thousands of times until the device had enough data points to create a digital image or 3D model. A 3D model is a mathematical representation of something three-dimensional. They are used to depict visuals for art, simulation, drafting, etc. and incorporated into virtual reality, 3D printing, art, video games, TV and medical imaging.

As technology progressed, so did storage space to handle large amounts of data. With storage space increasing drastically, the 90s saw a massive burst in 3D scanning capabilities, with the first 3D scanners hitting the commercial market, as well as optical technology allowed for scanning fragile objects and color scans. The relatively short timeline of digital 3D scanning means we are pioneering a new frontier. Scanners are more easily accessible, less cost-prohibitive, and more user-friendly. Today, 3D scanning primarily utilizes two types of technology: LiDAR and Photogrammetry.

LiDAR—Light Detection and Ranging (LiDAR)—is a remote sensing method that uses pulsed lasers to measure distances. Using an eye-safe laser means a LiDAR Scanner sends hundreds or thousands of invisible dots to measure distances and record the data for digital reconstruction. This 3D scanning technique is best for environments such as rooms and large objects such as cars, rocks, and buildings.

Photogrammetry—is an approach to 3D scanning that uses photography to map an environment and measure distances between objects. This technique is best for textures and capturing figures or small objects.

