

3D Scanner Machine Using Arduino

**Mr. Patahde Prasad Bhausaheb¹, Mr. Joshi Tejas Sandip², Mr. Chavan Pratik Babruvan³,
Mr. Bhalerao Omkar Ankushrao⁴, Prof. M. D. Mandhre⁵**

Department of Mechanical Engineering¹²³⁴⁵

Shri Chhatrapati Shivaji Maharaj College of Engineering, Nepti, Ahmednagar

Abstract: *In an era defined by digital transformation, 3D scanning technologies are becoming increasingly vital in domains ranging from manufacturing and engineering to education and heritage conservation. Yet, the high cost and complexity of commercial 3D scanners hinder accessibility, especially in academic and DIY contexts. This paper presents the design and implementation of a low-cost, Arduino-based 3D scanner that uses infrared distance sensing and stepper motors to capture the surface geometry of physical objects. The system employs an Arduino Nano, a Sharp IR distance sensor, stepper motors, and an SD card module to log scan data. The result is a structured point cloud that can be processed in software like MeshLab to produce usable 3D models in STL format. Experimental evaluation confirms the system's capability to scan small to medium-sized objects with reasonable accuracy. The scanner is entirely offline, modular, and open-source, making it ideal for educational institutions, hobbyists, and low-budget prototyping. Future improvements could include wireless control, enhanced sensing accuracy, and real-time 3D visualization.*

Keywords: Arduino Nano, 3D Scanning, Point Cloud, Infrared Sensor, MeshLab, Low-Cost Scanner, Embedded Systems, Reverse Engineering's

