

3D Scanning using Arduino UNO

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Abstract -

This document shows the required format and appearance of a manuscript prepared for IJSREM. The project focuses on building a cost-effective 3D scanning system using an Arduino Uno (UNO). The abstract presents concisely the objectives, methodology used, and results obtained. By using an ultrasonic sensor and a rotating platform, the system captures spatial coordinates to create a digital 3D model. This summary is substantive in nature and contains no numerical references.

Key Words: Arduino Uno, 3D Scanning, Mechanical Engineering, Ultrasonic Sensor, Automation, Point Cloud.

1.INTRODUCTION

The integration of electronics in mechanical systems has led to significant advancements in reverse engineering. This document shows the suggested format for manuscripts. Traditional 3D scanners are expensive; therefore, this project proposes a budget-friendly alternative using the Arduino Uno platform. This template is intended to be a tool to improve manuscript clarity.

2. Body of Paper

The body of the paper consists of numbered sections that present the main findings. These sections are organized to best present the hardware and software integration

2.1 System Architecture :The scanner operates by rotating an object on a platform while a sensor measures the distance. At the first occurrence of an acronym, we spell it out, such as Light Emitting Diode (LED).

- **Microcontroller:** Arduino Uno serves as the primary controller.

- **Sensor:** HC-SR04 Ultrasonic sensor for distance mapping.
- **Actuator:** Stepper motor for precise 360-degree rotation.

Table -1: Sample Table format

S.R	Component Name	Specification / Model	Quantity
A	Electronic Components		
1	Microcontroller	Arduino UNO R3 (ATmega328P)	1
2	Expansion Shield	Arduino CNC Shield V3	1
3	Stepper Motor Driver	A4988 (with heatsink)	2
4	Stepper Motor	NEMA 17 (17HS4401)	2
5	Distance Sensor	VL53L0X (ToF) or Sharp IR	1
6	Power Supply	12V, 2A DC Adapter	1
7	Wiring	Dupont Jumper Wires (Set)	1
B	Mechanical Hardware		
8	Structural Frame	2020 Aluminum Extrusions (Meters)	2
9	Frame Hardware	M5 T-Nuts, Bolts, Corner Brackets	1 Lot

10	Lead Screw	T8 (8mm dia, 2mm pitch, 300mm) + Nut	1
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The data collected is sent to a computer to generate a visual representation. Abbreviations such as SI and IEEE do not have to be defined. We avoid using abbreviations in the title or heads.



Fig -1: Figure

3. CONCLUSIONS

The project successfully demonstrates a functional 3D scanner. The online version of this research will be available for academic reference. This system proves that high-quality data collection is possible with low-cost components in the field of Mechanical Engineering.

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The heading is treated as a 3rd level heading and is not assigned a number. The authors thank Samarth Polytechnic Belhe for providing the technical resources.

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BIOGRAPHIES

Author	Description
Ashwin Balu Adhav	Student of Diploma in Mechanical Engineering at Samarth Polytechnic, specializing in 3D automation.
Omkar Ashok Jundre	Final year Mechanical Engineering student with a focus on Arduino-based robotics.
Sujal Tukaram Shinde	Interested in mechanical design and computer-aided manufacturing.
Deepak Dattatray Gagare	Project team member focused on hardware testing and calibration.