

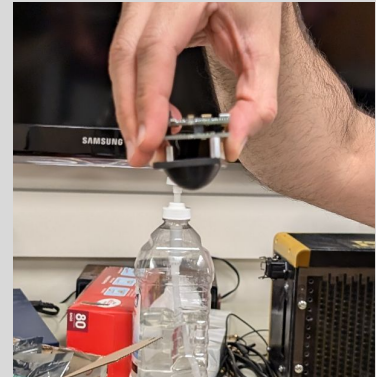


Product Research

Project Overview

The project we are working on is a millimeter wavelength scanner that makes use of the open source Voron 3D printer platform.

We will be utilizing the firmware already available for the Voron system and building a web enabled user interface. With the click of a button the scan head should move across a predetermined path to cover the scan bed.

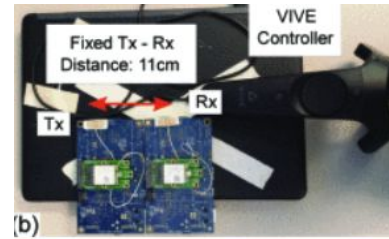


Problem Statement

Scanning can be a time consuming process and there are often not enough scanners to go around. Simply buying a scanner would be an option if they were not exorbitantly expensive. Fortunately with a single millimeter wave radar scanner and an open source 3D movement system from a Voron printer we can build a cheap scanner with large scan volume. With the addition of a simple user interface that can be remotely accessed; Scanning at CNDE will be better than it ever has been for the technicians, leadership, and clients.

Related Products

- airport scanner ProVision ATD
 - This is purpose built to scan the entire body in one go and automatically detect any threat the subject may possess.
- Creality Ender 3 3D printer
 - This has a large printing size that achieves more printing requirements and ideas along with precise positioning and stable structure
- MilliCam - Handheld millimeter wave scanner
 - This is the first handheld millimeter wave imaging system that produces high-quality imaging



Market Gap

- Safe and Sound Pro mmWave Meter: \$849.00
 - Detects and measures 5G in the high mmWave band
 - 20 GHz to 40 GHz
- Mole 3D Scanner - Premium Edition: \$629.50
 - Up to 0.05mm accuracy for high-precision scans
 - 0.1mm resolution captures intricate details
- CR-Scan Raptor 3D Scanner: \$1499.00
 - Metrology Grade Accuracy, up to 0.02mm
 - Objects between 5-2000mm



New Ideas

Higher than traditional frequency range (119 - 134 GHz vs 24 - 30 GHz)

Moving a single scan head around to cover a volume of space.

Simple UI that can be operated remotely.

It may be possible to extract more information from the scan such as material composition

Cost effective design (only one scan head, cheap parts, designed in house)

All of these ideas packaged into one neat package that is easy to use will be what gives our project an edge and value to those who will use it.

Conclusions

This product we have been tasked with creating will differ from current market millimeter wave scanners in the cost and controls categories by utilizing Voron parts and creating our own specifically designed software. This scanner will allow for remote scanning for CNDE lab workers and greatly speed up the scanning process in the lab while allowing access to higher frequencies. Lastly, it will be in one contained system and will be able to move in three dimensions. It will be of great use in the Center for Nondestructive Evaluation and possibly markets beyond.



Thank You