

# Condition Assessment of End-of-Use Products for Remanufacturing



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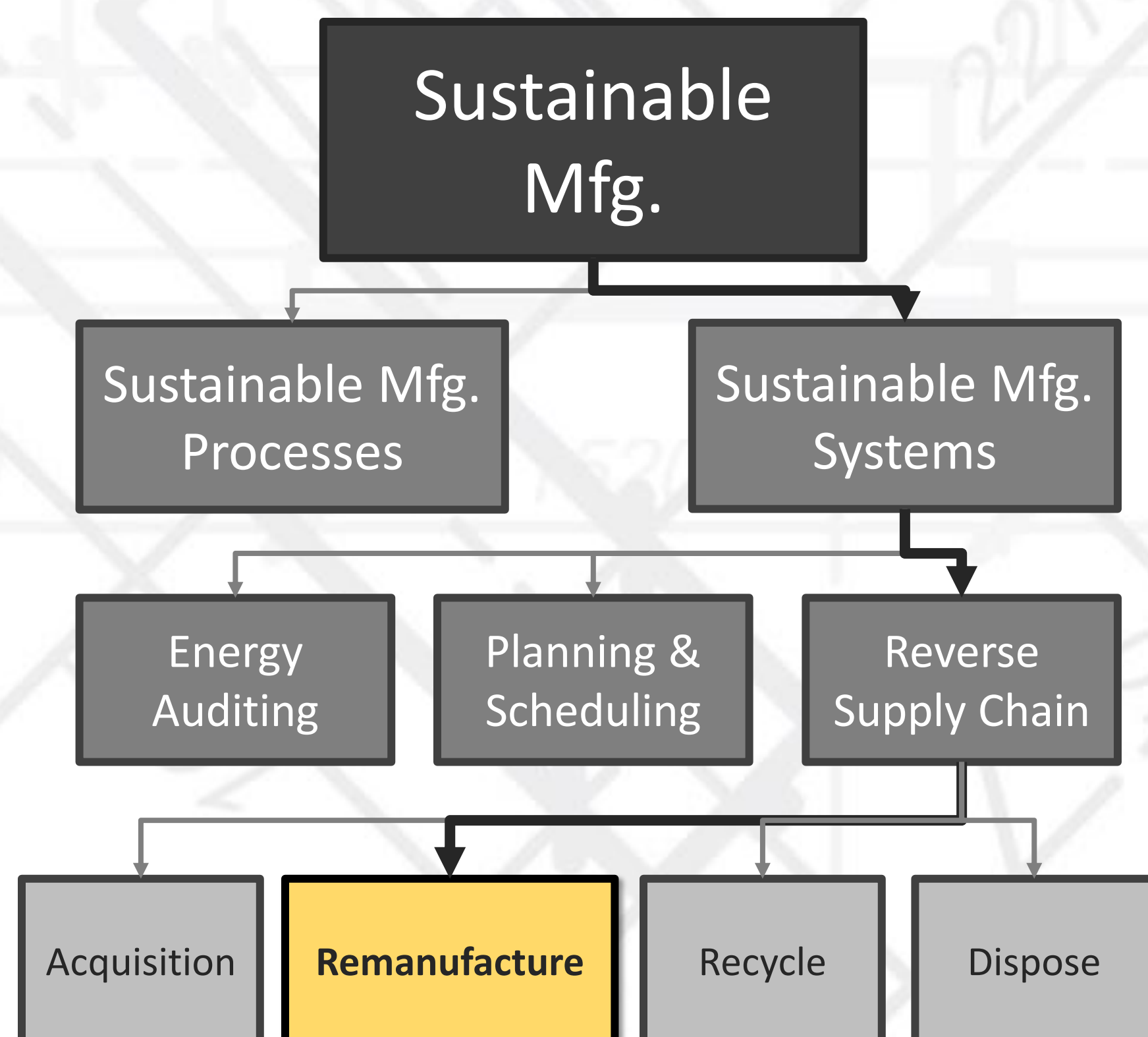
## About Me

As a Detroit native it has been a long life dream to become a leading force in the engineering industry. It is one of my greatest pleasures to present some of my work to innovative minds like myself. I've had a long journey and my way has not been clear, but today as a junior Industrial and System Engineering student my path is getting clearer everyday

## Project Introduction

Remanufacturers encounter high uncertainty in component quality. Inspection and assessment reduces this uncertainty to make downstream cleaning and reprocessing operations efficient. The goal of my project is to use an automated 3D laser scanner to assess and compare point cloud measurements of capnuts in order to detect damages or corrosion.

## Relation to Sustainable Mfg.



## Approach

- Test bed set-up and design
- Create 3D model using AutoCAD
- Prevent reflectivity with spray paint
- Acquire point cloud and compare with CAD dimensions
- Acquire 2D image for corrosion assessment

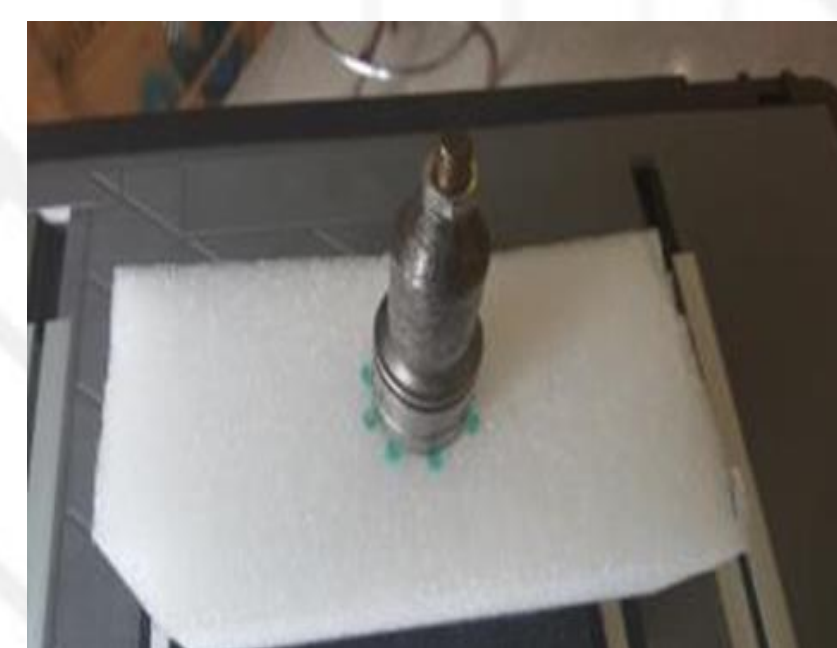


Figure 1  
Test bed and Capnut with marked parameters

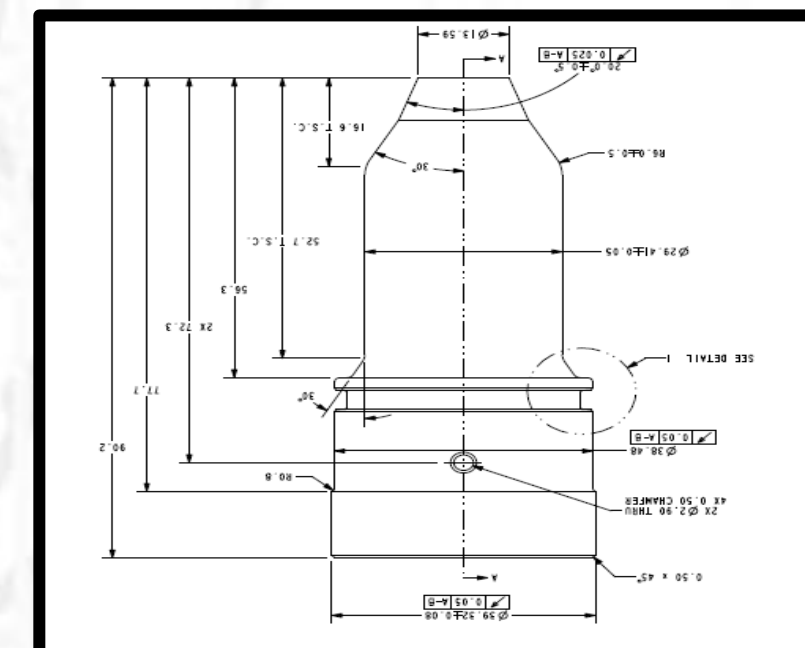


Figure 2  
2D model (Blueprint) to create CAD 3D model

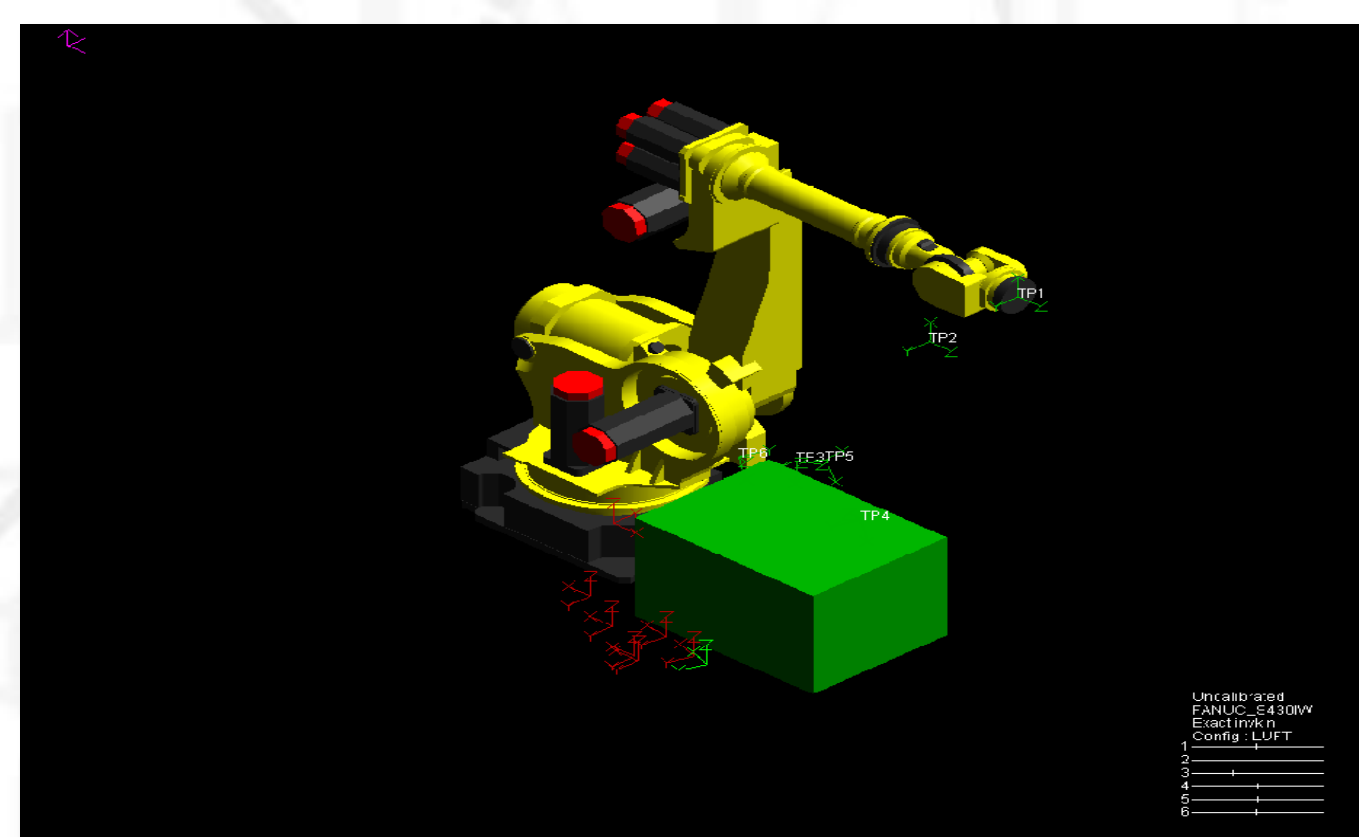


Figure 3  
This figure represents the simulation robot and 3D laser used for condition assessment and 3D modeling.



Figure 4  
Capnut to be assessed that can have physical wear or corrosion damage.

## Results

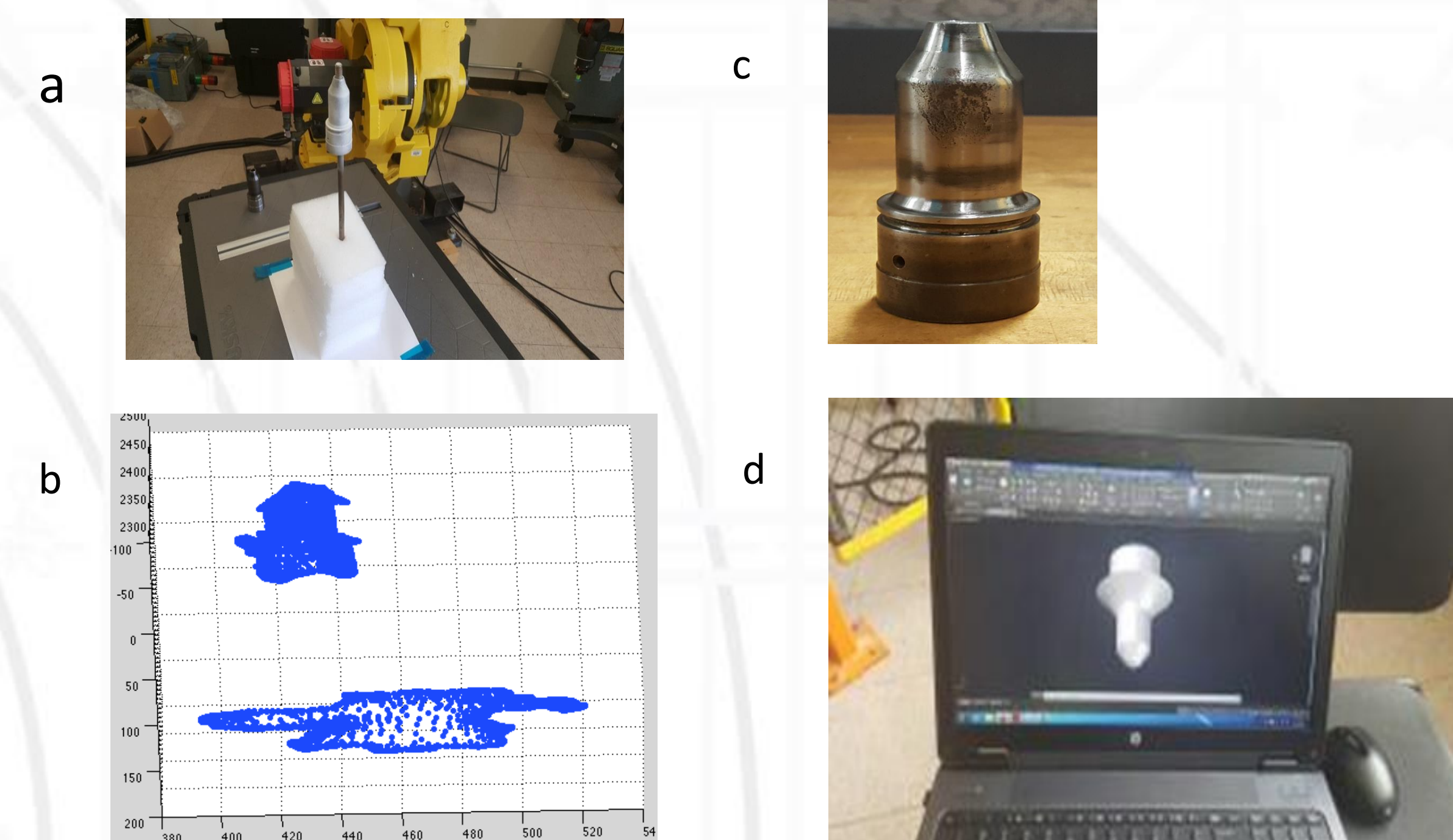


Figure 5  
a) Reflectivity prevention, b) Point cloud measurements, c) Corroded part, d) 3D model

## Conclusions

As a result of our experiment we were able to create a trajectory and scan a part. We discovered that the reflectivity of the part will affect the ability of 3D scanning. In the future this might limit the ability in 3D scanning to be used for inspecting specific part, and thus studying the parameters that affect the scan quality should be considered.

## Acknowledgements

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