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## Quality Control of Quilted Products with a Computer Vision Approach

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## Abstract

This ongoing research examines the consistency of fill distribution in down and synthetic quilted comforters manufactured by Cuddledown in Yarmouth. Automated visual inspection uses a digital camera that captures an image of down distribution in a production cell. The captured image is then fed into a computer for processing. The project's primary goal is to determine the feasibility of augmenting and/or replacing the existing manual quality control process with a computer vision system.

## The Challenge

The specific tasks are to determine accurate and repeatable measures of product quality from a database of acquired images, to formulate quality requirements based on these measures, and finally to use these measures to grade and flag products coming off the production line.

## Background

This project examines the consistency of fill distribution in down and synthetic quilted comforters manufactured by Cuddledown in Yarmouth, Maine. When completed, this project will reduce the amount of waste, improve and speed up the quality control process, and reduce cost.

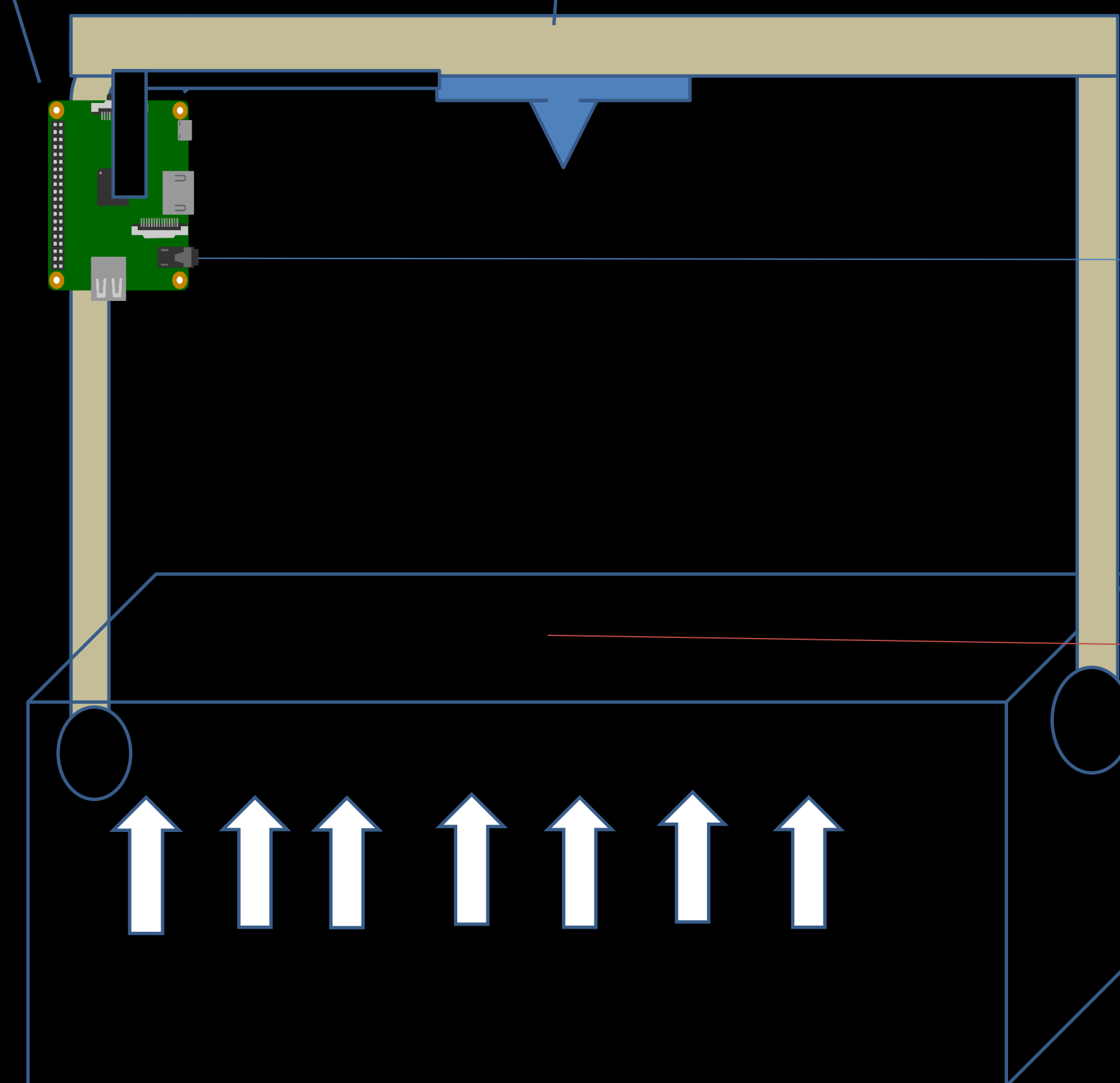


**Raspberry Pi:**  
Uses a NodeJS application to control the camera

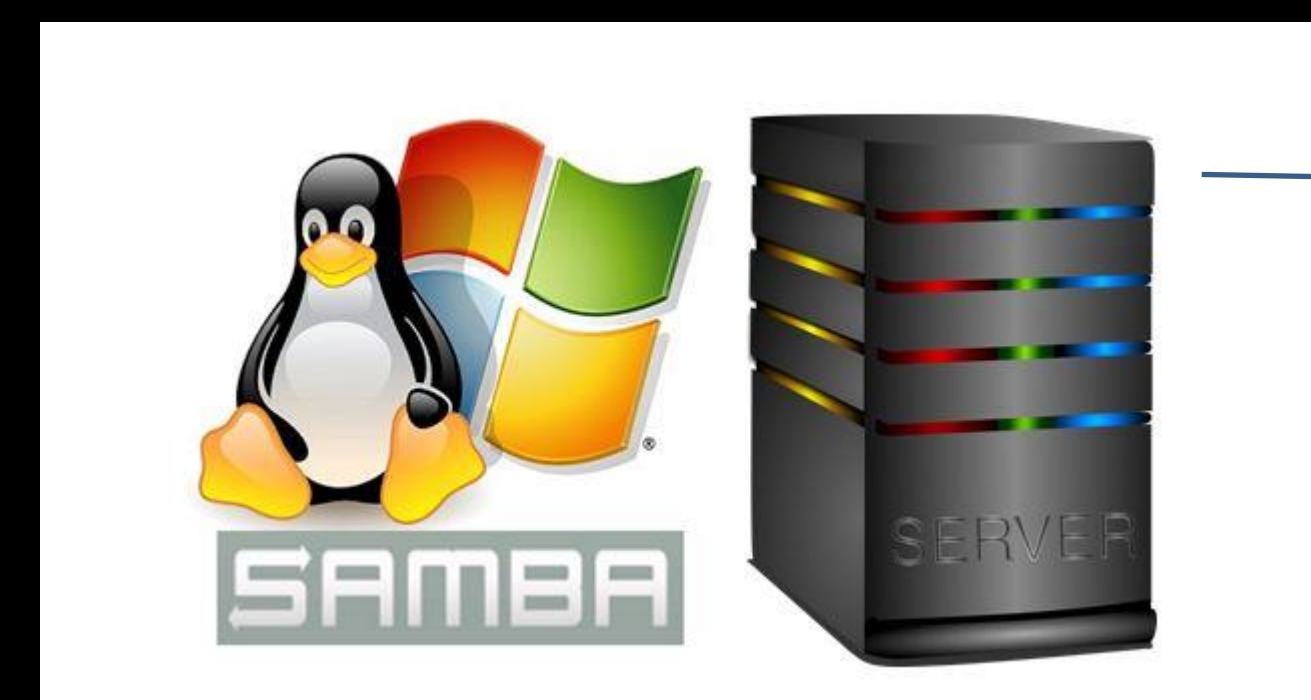
**Raspicam:**  
Takes pictures



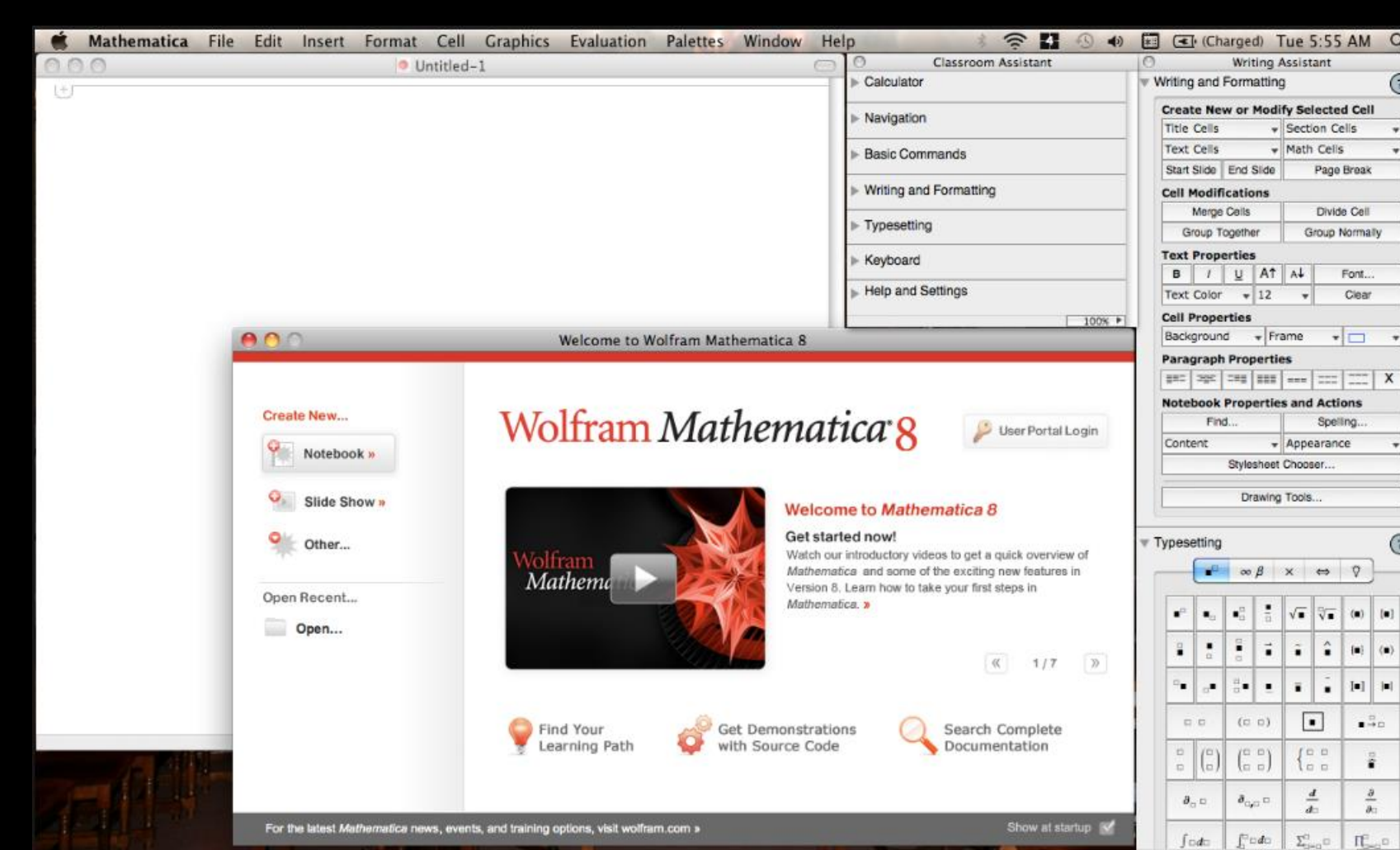
Raspberry Pi with a raspicam



Picture: Prototyping light table

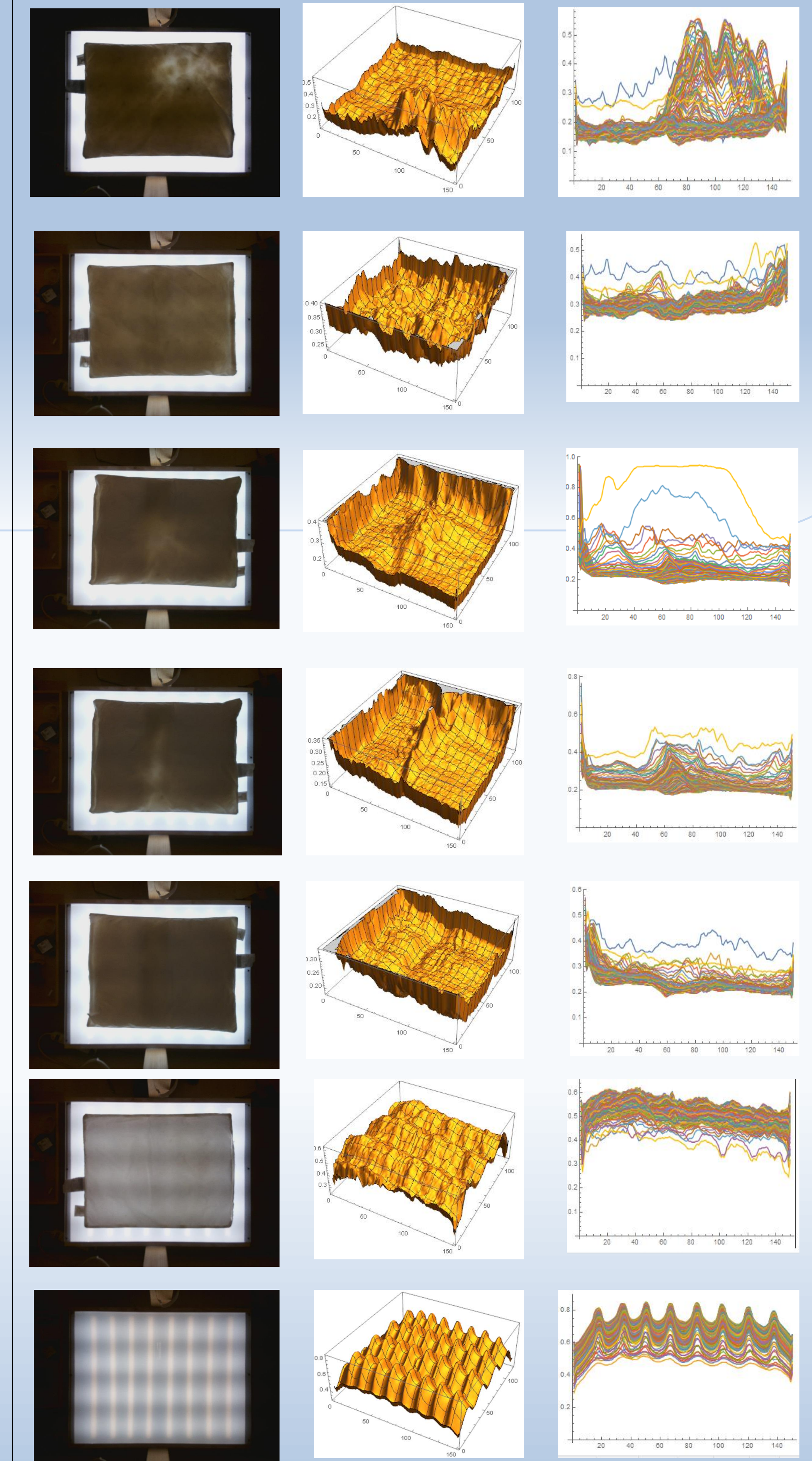


**Samba software:**  
Samba sets up network share between the Raspberry Pi and the laptop



**Mathematica:**  
Processes images using computer vision techniques

## Experiments



## Future Scope

- ☐ Develop an active notification system to grade and flag down products
- ☐ Build an automated system at the production line that can distribute evenly the material.
- ☐ Explore other markets

## Discussion of Results:

The test results shown are preliminary considering further improvements which will be done on the lighting source. However, these results provide optimism and a strong foundation for further analysis .

Acknowledgements:  
Professor Mariusz Jankowski  
Alan Lucas, Mentor , Ci2 Lab



# Banner: A Descriptive Title

Your Name & Affiliation, Your Co-author's Names & Affiliations, Your Mentor's Name & Affiliation

## Abstract

(can be updated from what you submitted)

## Introduction or Background

Tell the reader what they need to know to put your study in context.

## Hypothesis/Question/Objective

Highlight using bullets, bolded font, etc.

## Methods

•This is a good section to use bullets rather than paragraphs.



Figure 1. Descriptive Caption



Figure 2. Descriptive Caption



Figure 3. Descriptive Caption

## Results

Make sure you refer to figures in your text (Figure 1). Give only general patterns, highlighting what your figures show.

## Discussion/Conclusions/Next Steps

- How does your work compare with published literature?
- What is the significance of your findings?
- Make sure you have answered the Hypothesis/Questions/Objective you outlined earlier.

### Acknowledgements

Remember to thank your classmates, mentors other professors who contributed or supported your work. Mention any grants or fellowship that supported your work. This can also be in a smaller font.

### References

These can be in smaller font, for those who are interested.