Digital Image Processing Final Project

Group 10

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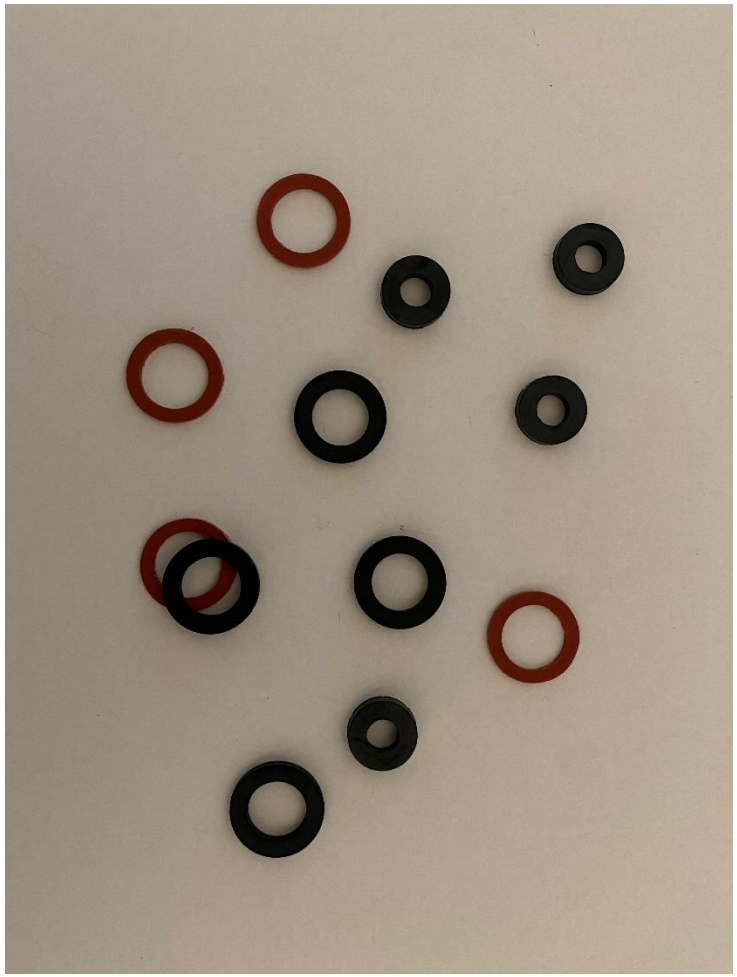
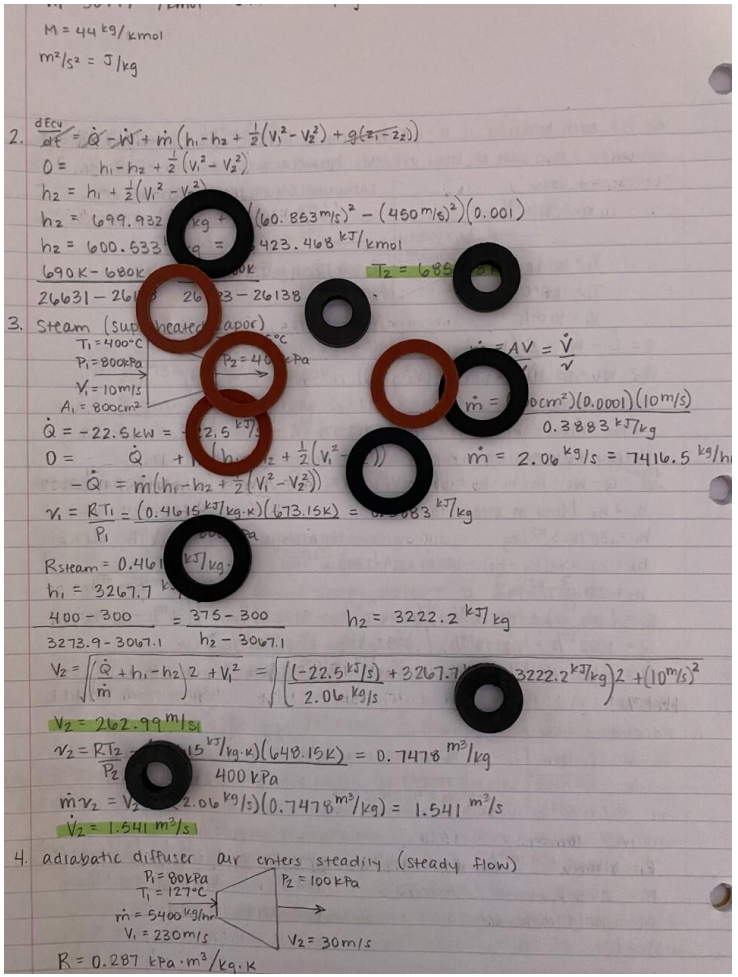
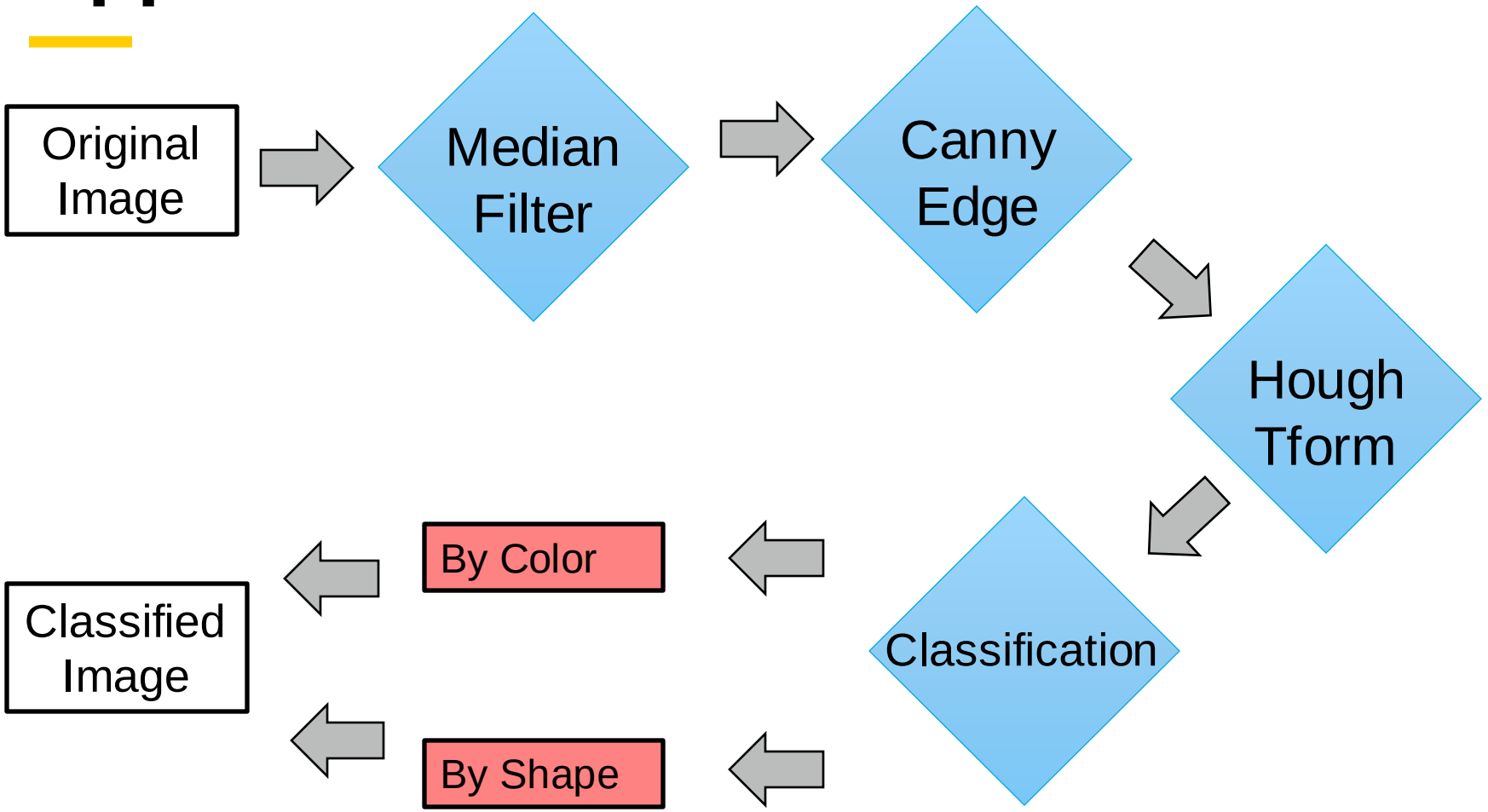
Initial Images

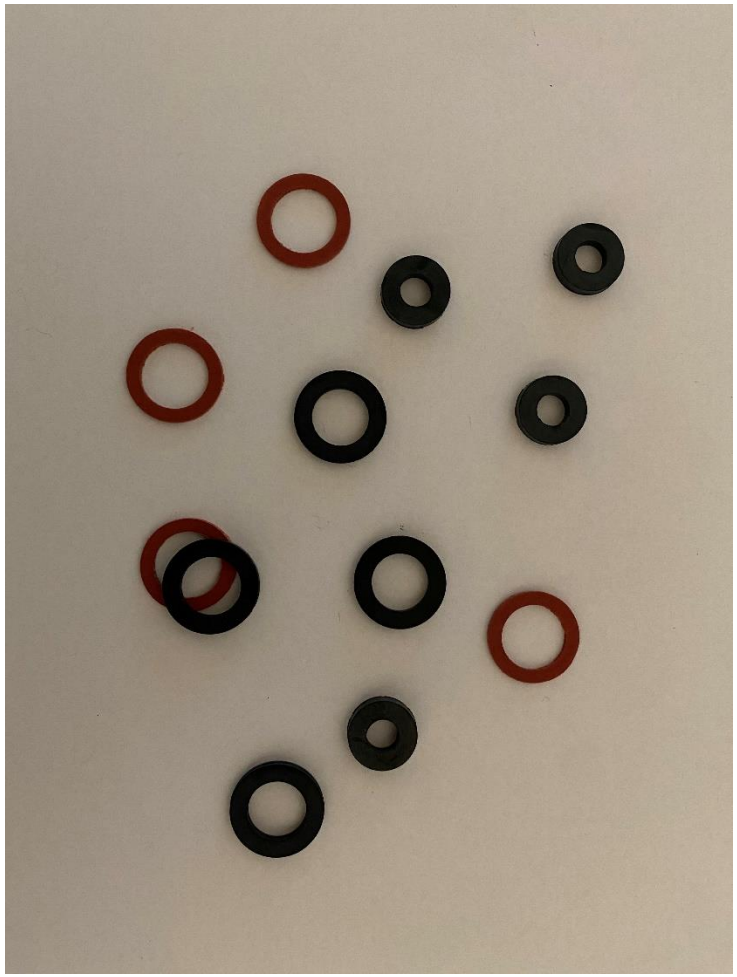




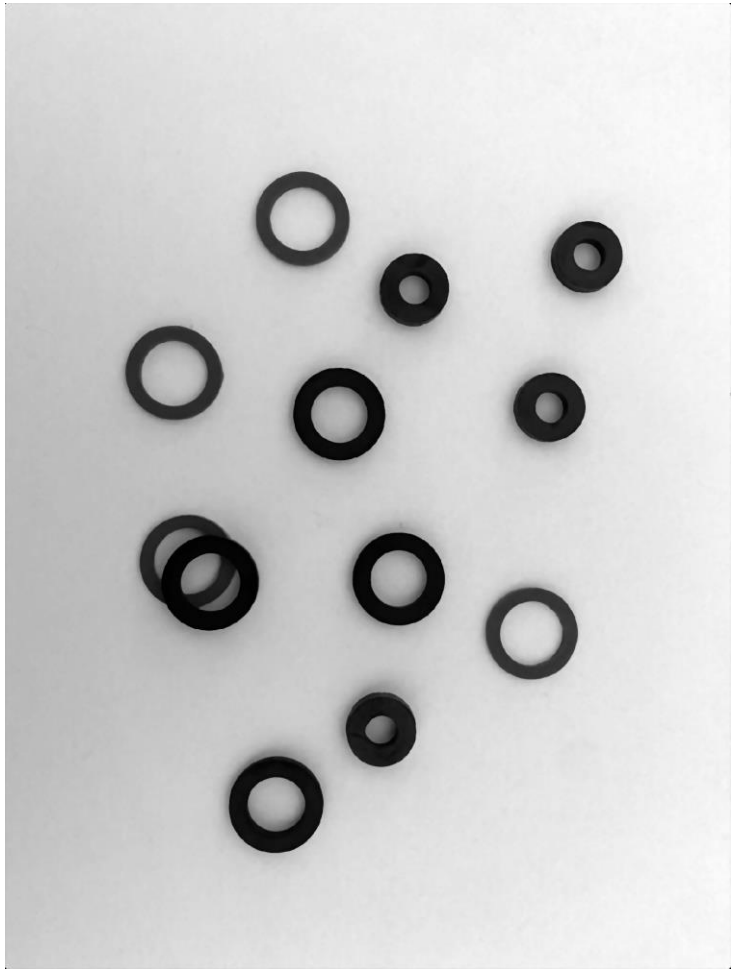
Approach Overview

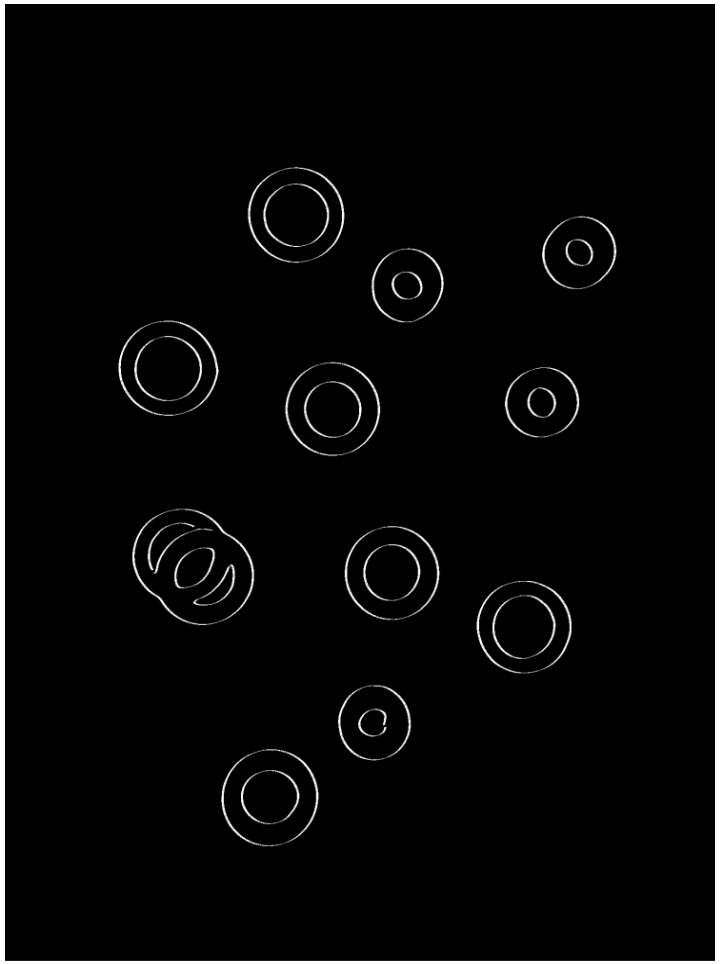


Median Filtering

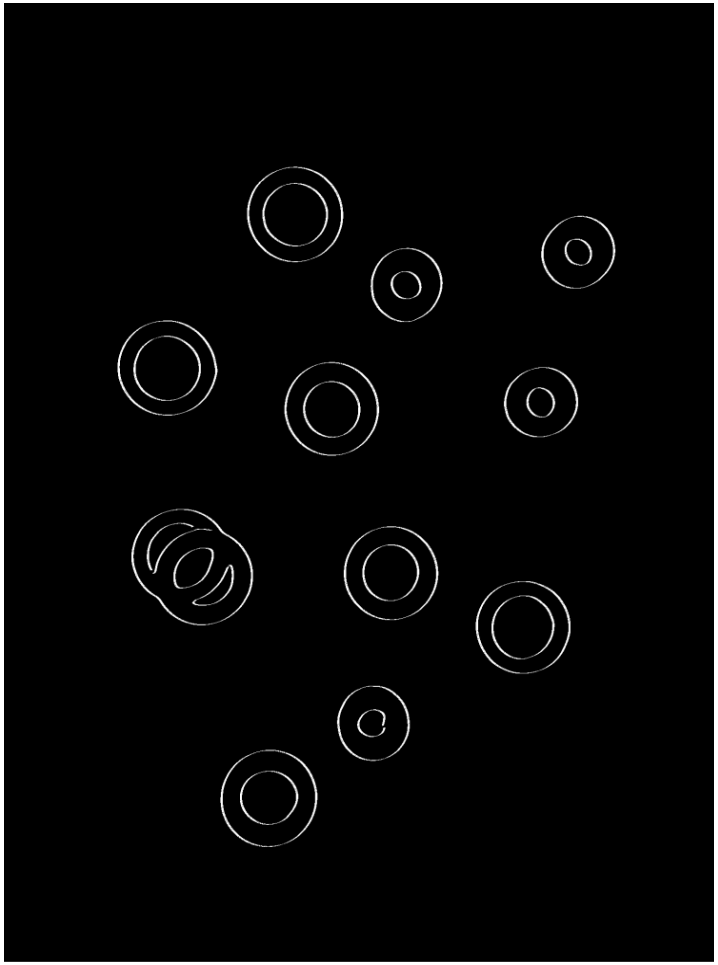


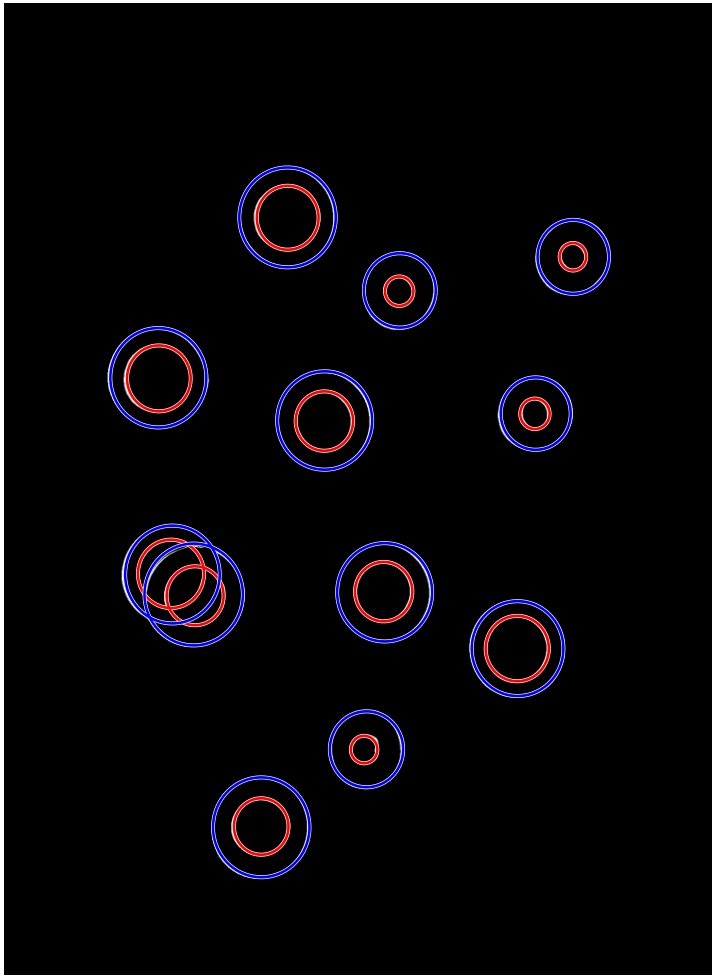
Canny Edge Detection





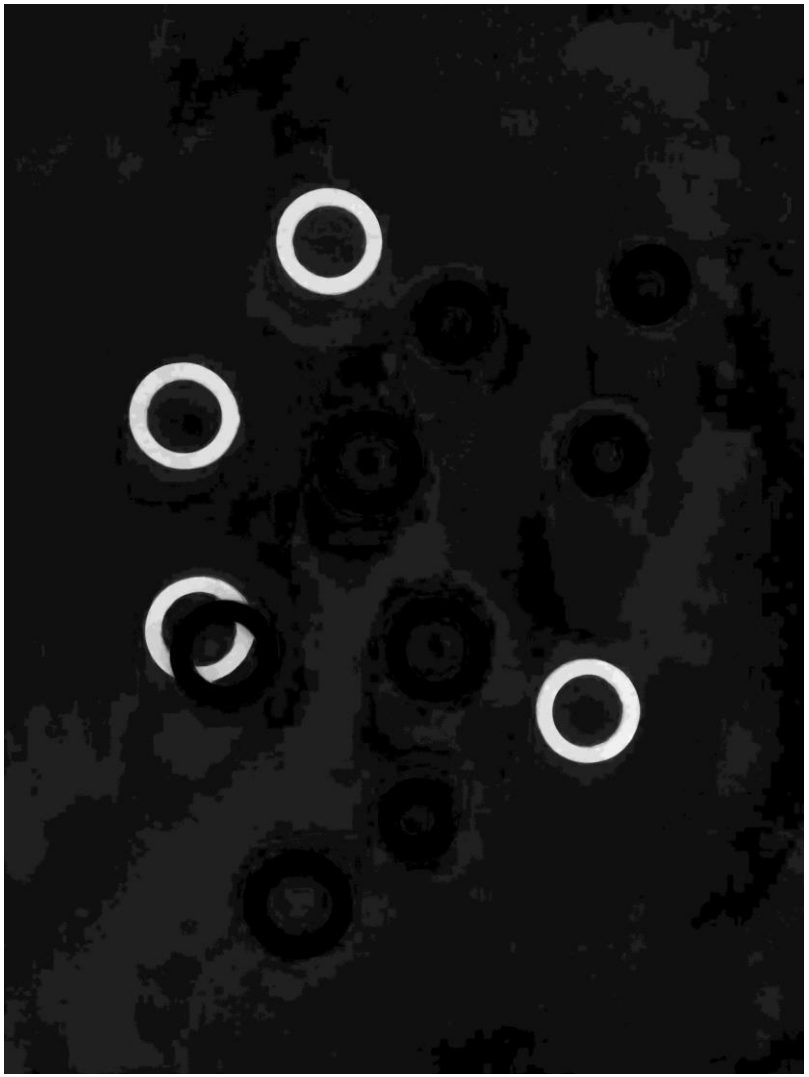
Circular Hough Transform





Color Classification

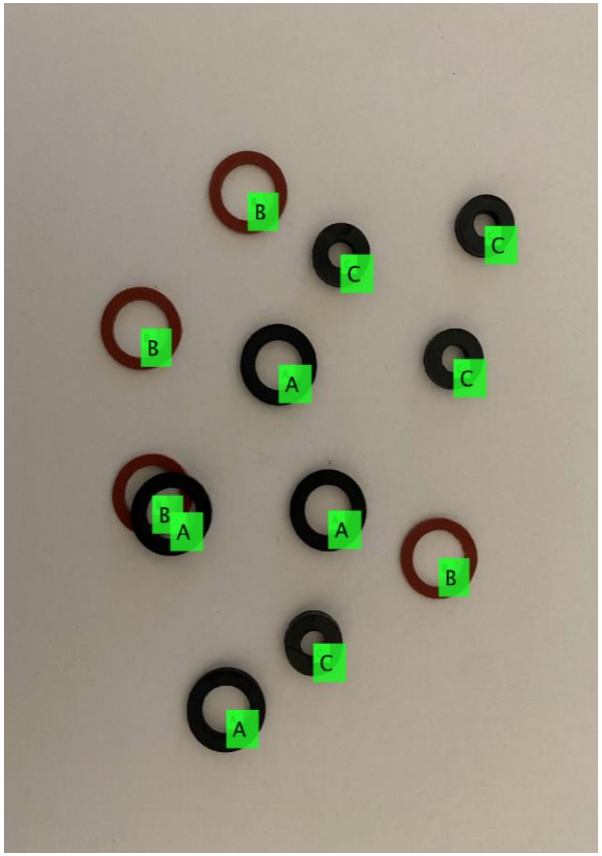
- Only kept Red & Blue Channels
- Provided maximum color contrast

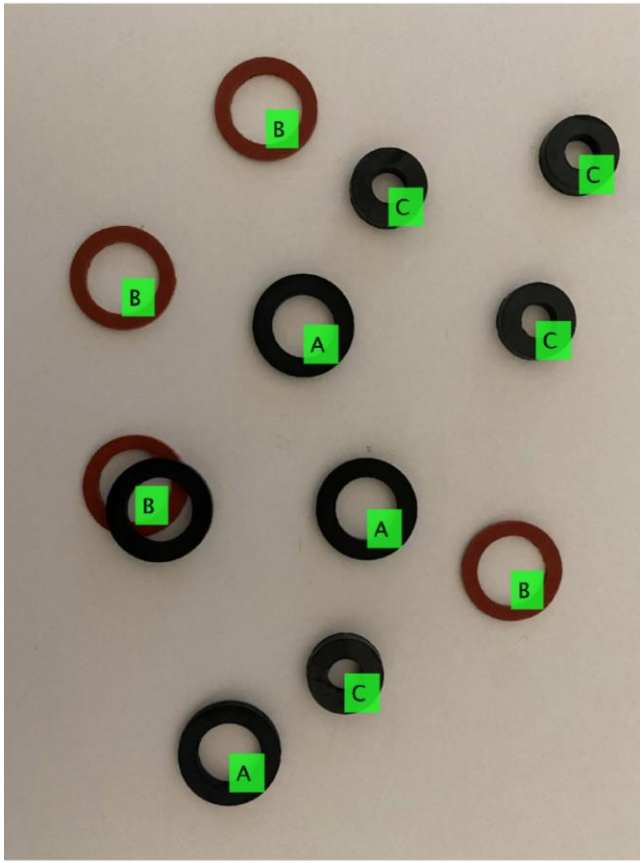


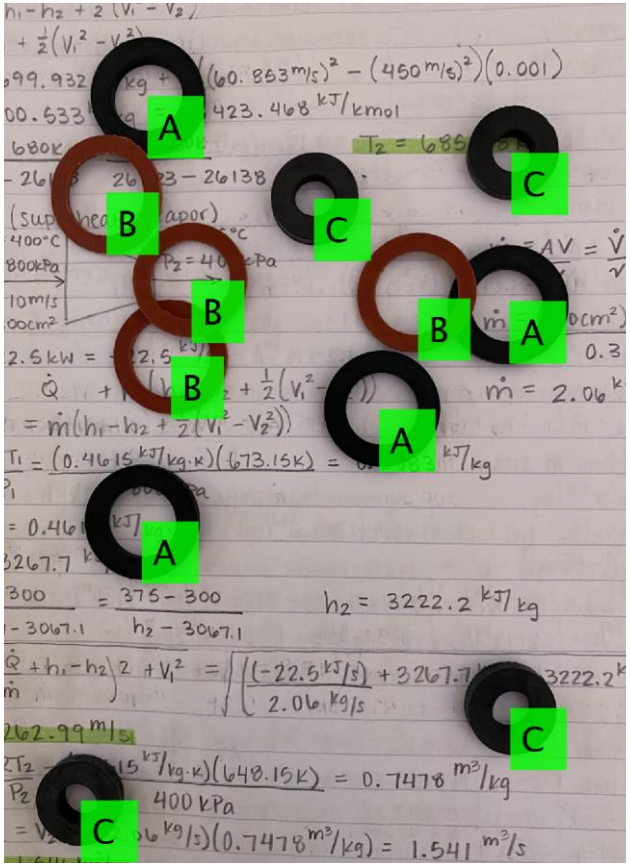
Results

		Type		
		A	B	C
Classification	A	21	0	2
	B	0	24	0
	C	2	0	22
	None	1	0	0

- 93% accurate across all images







Conclusions

- Performance: works 97.2% for solid background.

- Issues encountered:
  - Generalization of the algorithm
  - Difficulty to locate the pixels in washer annulus in challenging background.
  - High contrast dependent

- Insights: overall contrast and background scales influence object segmentation.

Thank You!