

# SEEING. SENSING

## INTRODUCTION TO UNISPECTRAL

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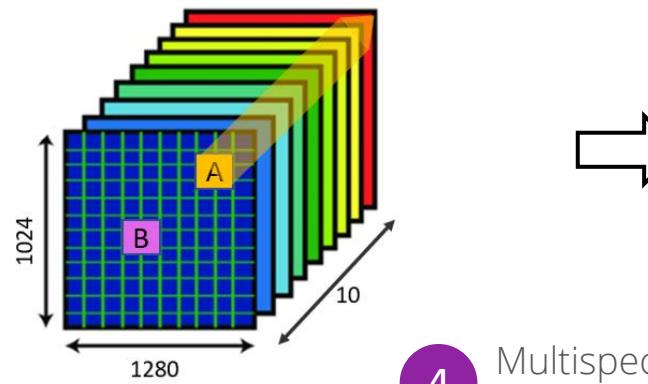
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# Multispectral Data analysis process

## 1 Multispectral Cube

- 10 bit – each pixel value in range [0-1024]

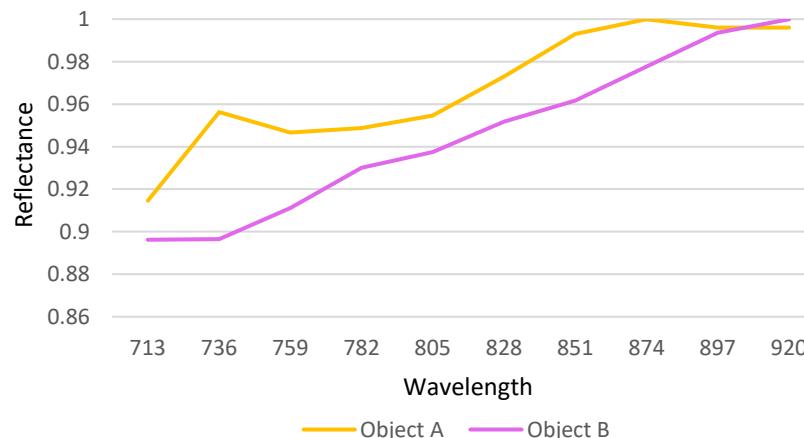


## 2 Spectral Data Extraction

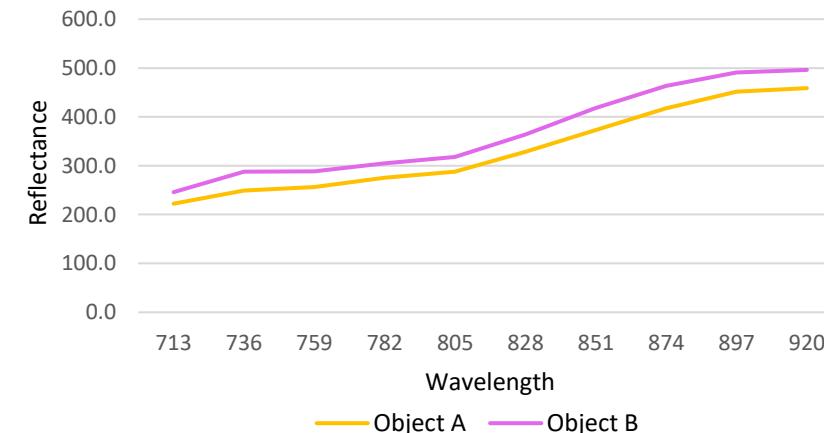
Objects region mean data reflectance values for each band wavelength

Wavelength	713	736	759	782	805	828	851	874	897	920
Object A	198.8	249.0	261.9	275.3	300.9	328.5	373.3	417.8	451.5	459.2
Object B	245.7	278.2	288.4	304.5	332.9	364.1	417.9	463.4	490.8	495.9

## 4 Multispectral footprint Normalized

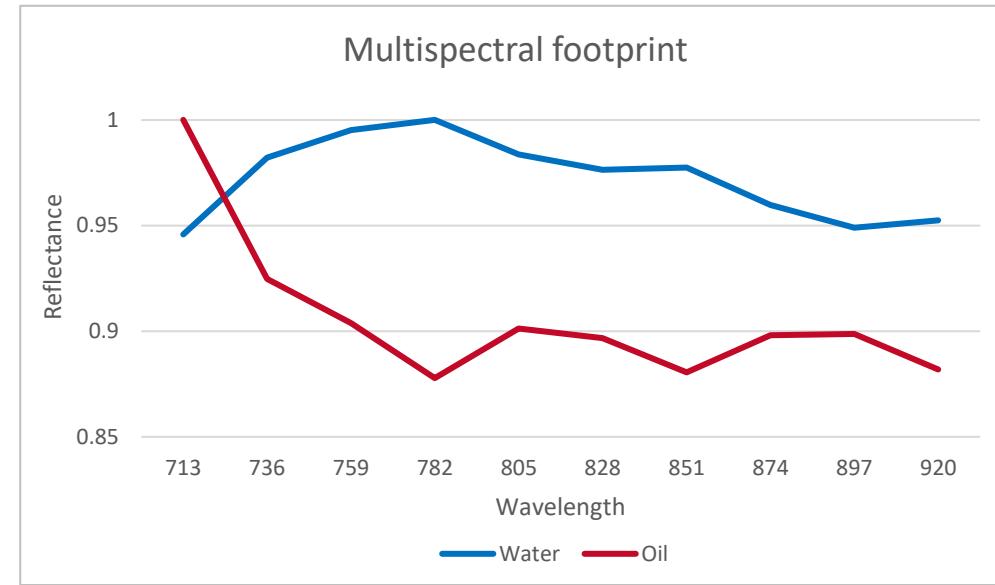
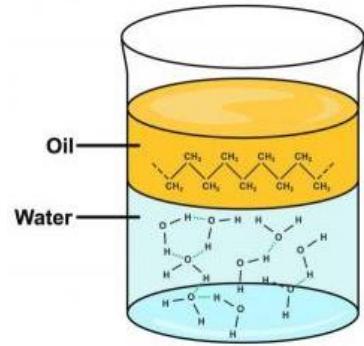


## 3 Multispectral footprint Raw data



# Multispectral test: Oil vs Water

Classification



RGB



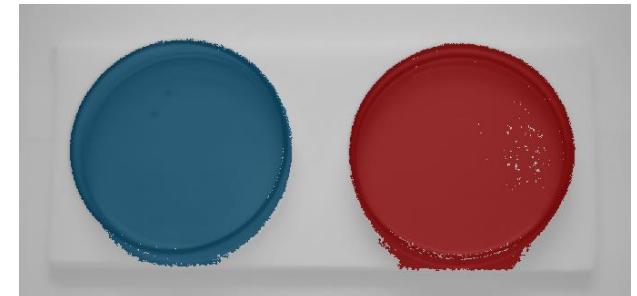
Water

Oil

NIR (850nm)

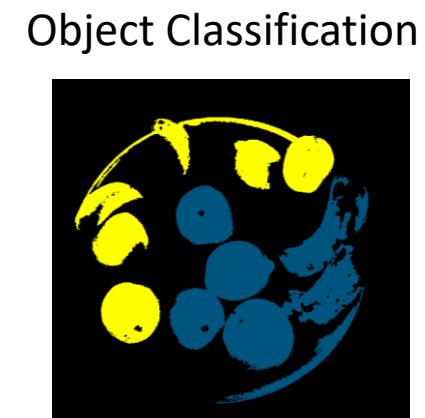
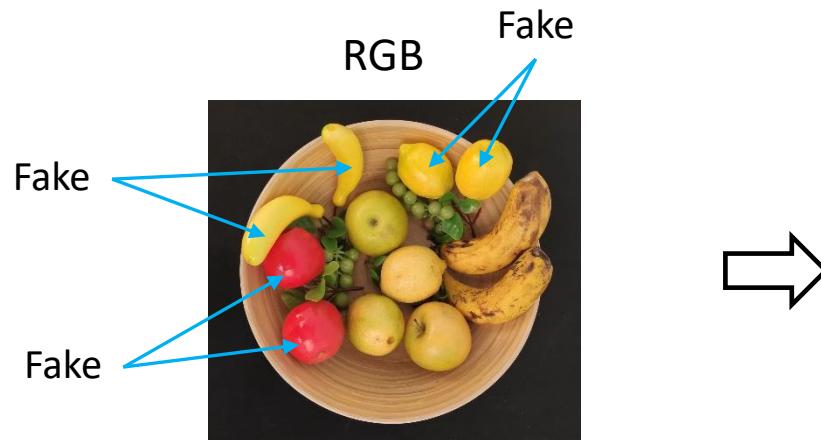
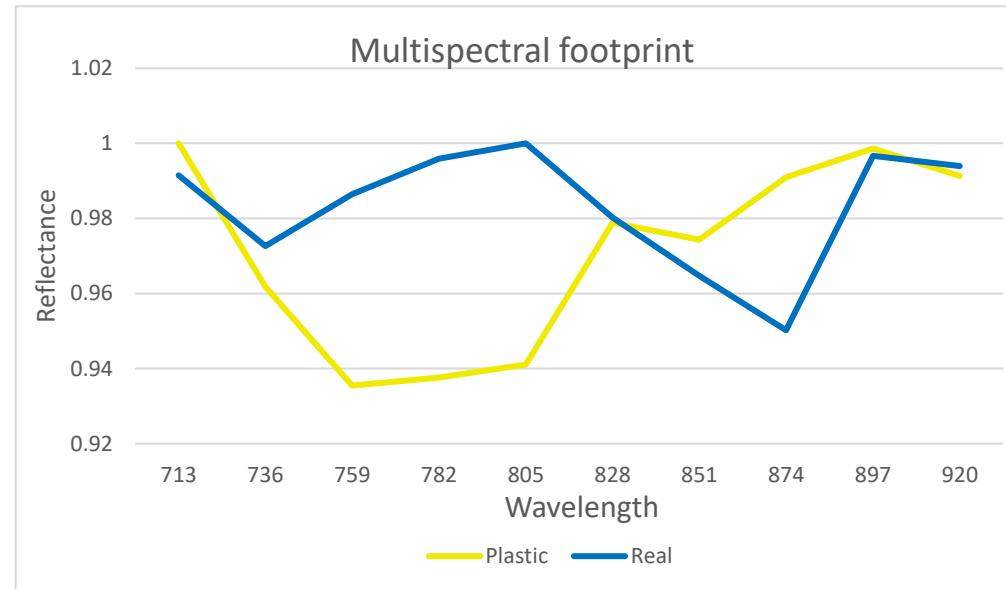


Object Classification



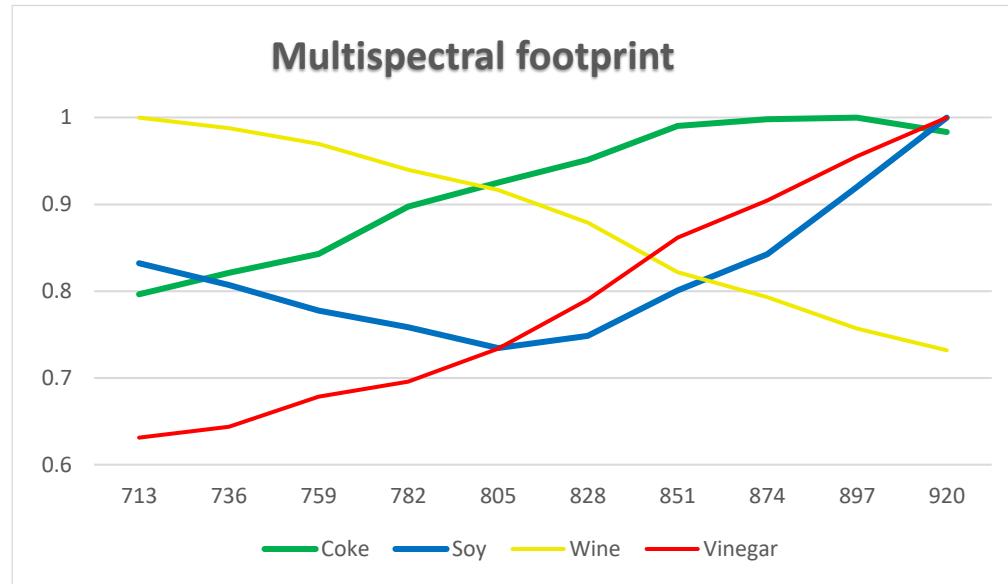
# Multispectral fruits test: Real vs Plastic

Classification

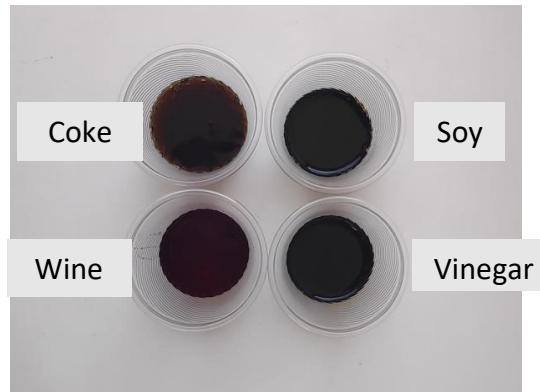


# Multispectral liquids test: Red wine / Vinegar / Coke / Soy sauce

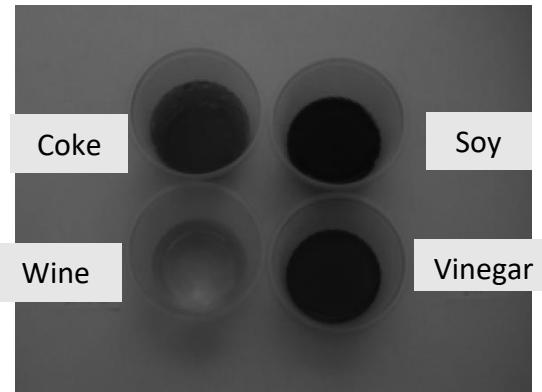
Classification



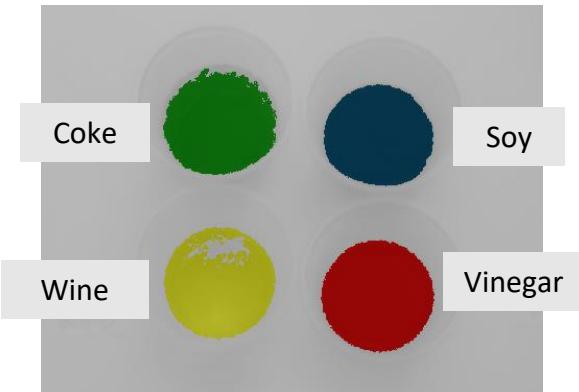
RGB



NIR (750 nm)

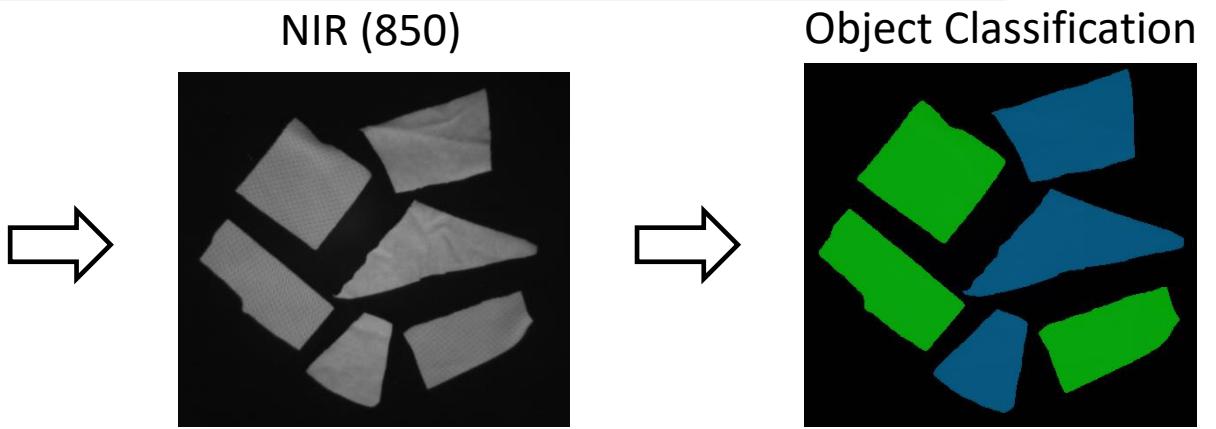
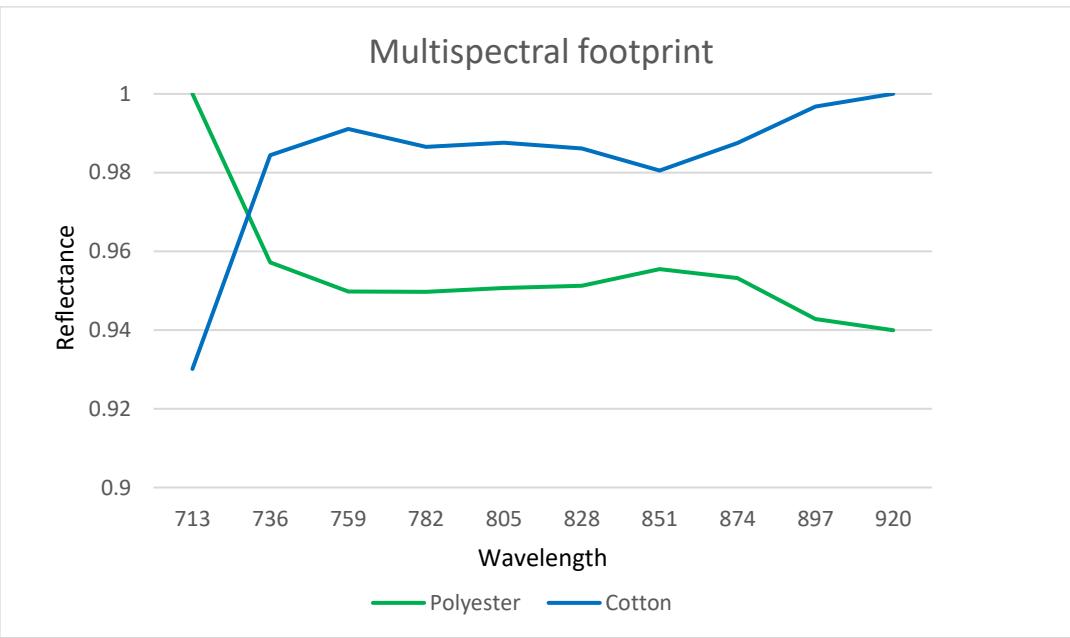
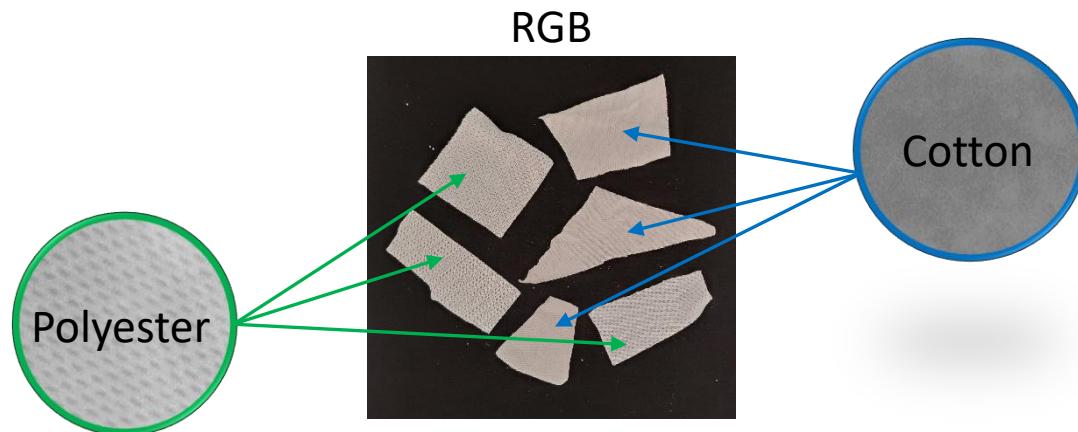
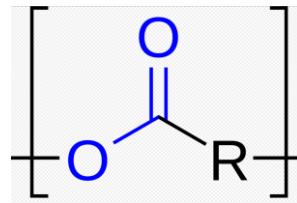


Object Classification



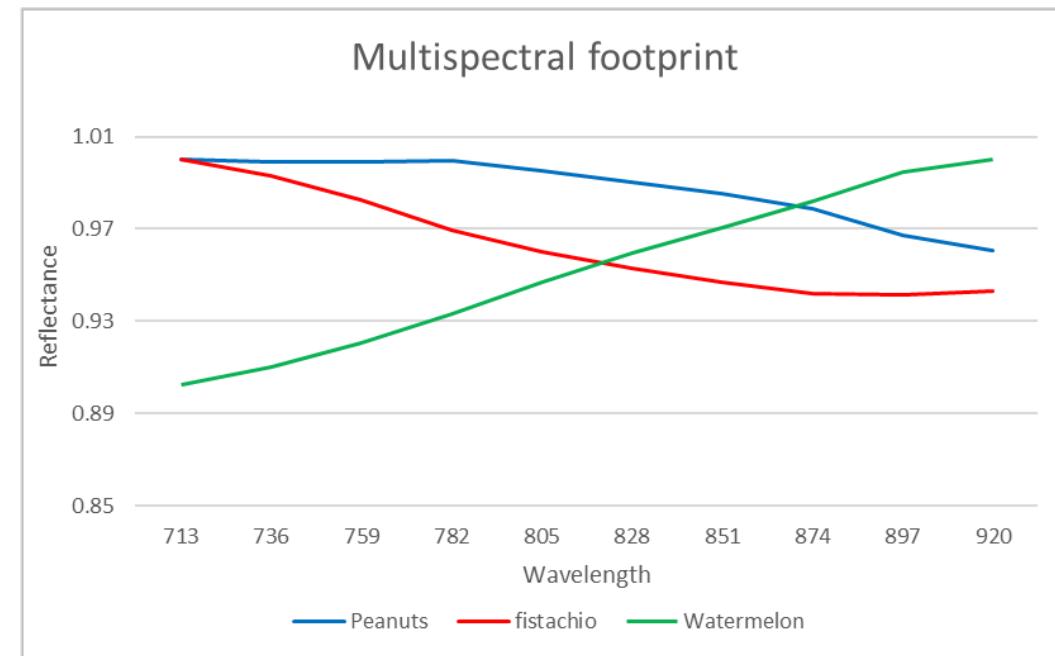
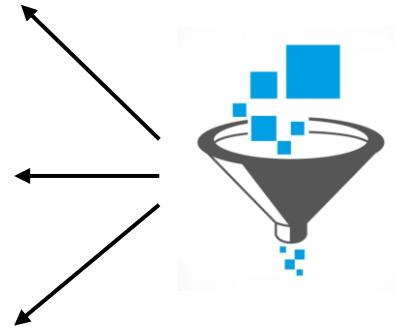
# Multispectral fabrics test: Cotton vs Polyester

Classification



# Multispectral seeds test: Peanut vs Watermelon vs Pistachio

Classification



RGB

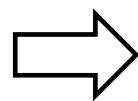
Peanut

Watermelon

Pistachio

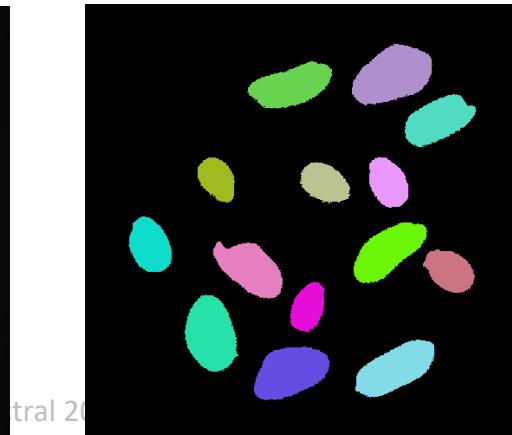


NIR (805nm)



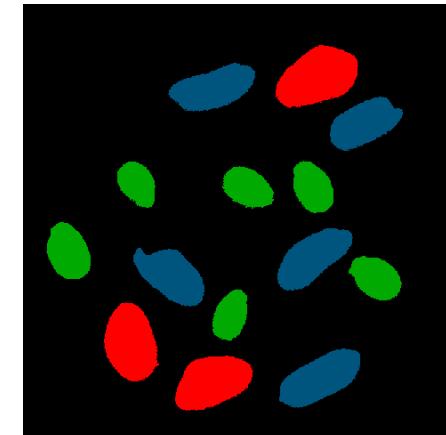
Unispectral in

Object Segmentation



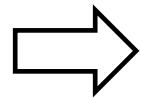
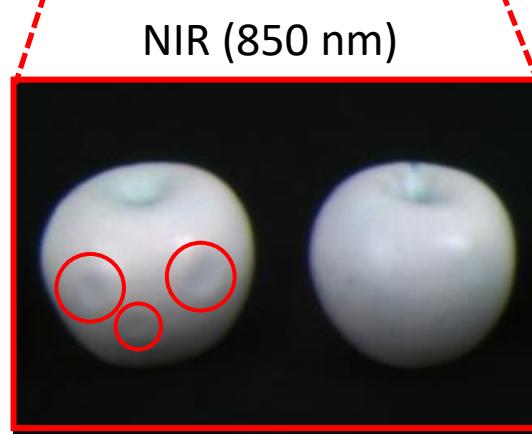
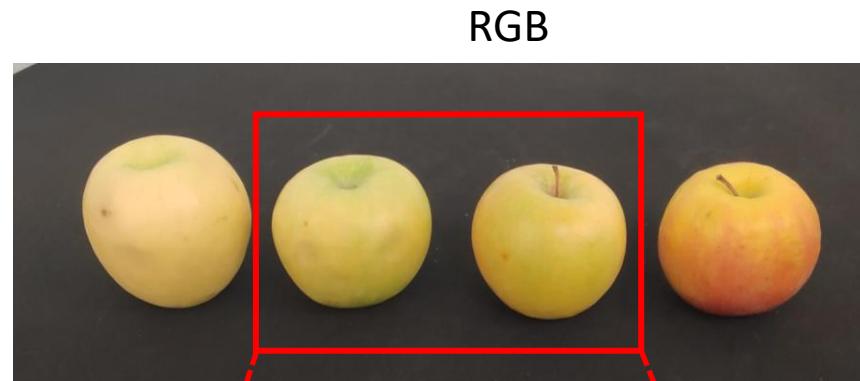
Central 20%

Object Classification

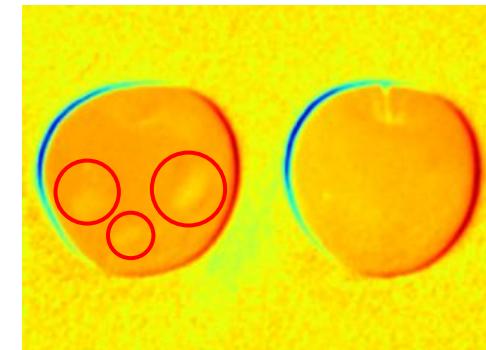


# Multispectral test: Apple's quality inspection

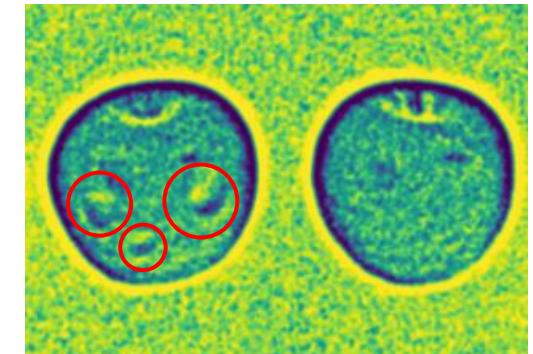
False Color



False Colorization

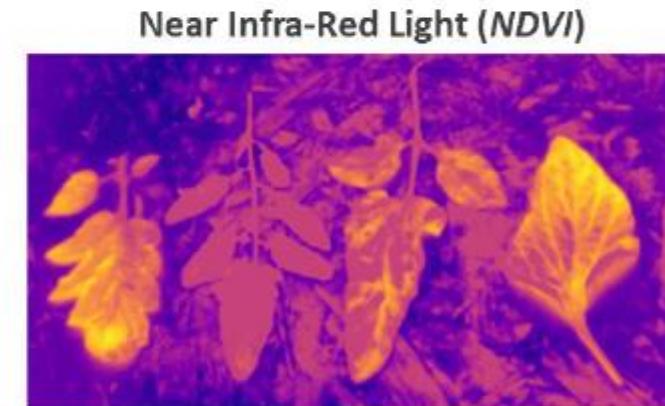
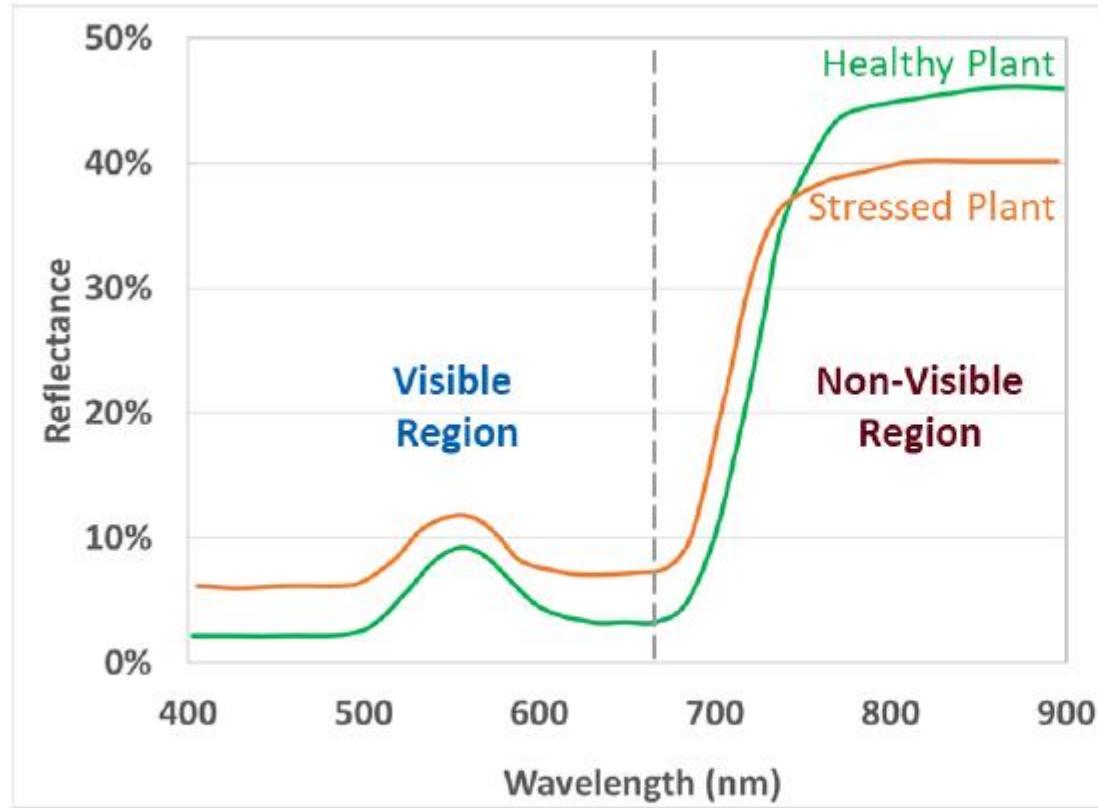


Adaptive Threshold



# Multispectral test: Leaves stress detection

False Color



# Thank You

Confidential

