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**HW03**

1. Exploring Color Spaces

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| **Image Name** | **Task to Perform** | **Best Channel** |
| ANPR\_IMG\_2387.jpg | Telling the license plate from the car color. | Green Channel, with a contrast of about 0.4 |
| Macbeth\_7457.jpg | Telling the red square from the black square. | Red Channel, with a contrast of about 0.7 |
| Michelle\_Carter\_first\_us\_shot\_put\_gold\_wi  nner\_2016\_\_credit\_Alexander\_Hassenstei  n\_via\_Getty\_Images\_2016.jpg | Detecting the name “CARTER” against the white background. | Saturation Channel, with a contrast of about 0.5 |
| TBK\_Kite.jpg | Telling the red patch of the  kite from the background sky. | Hue Channel, with a contrast of about 0.6 |
| peppers.png (matlab image) | Detecting the yellow pepper from the other objects. | Red Channel, with a contrast of about 0.7 |

2. Exploring Noise

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| **Image Name** | **Average Value** | **Standard Deviation** | **Observations about region of interest** |
| GRAY\_GC01\_7334 | 0.482 | 0.001 | Brightest image in the bunch so the darker specks of noise are more visible |
| GRAY\_GC02\_7354 | 0.363 | 0.001 | Slightly darker than the previous image but brighter than the next |
| GRAY\_GC04\_7370 | 0.34 | 0.001 | Slightly darker than the previous image |
| GRAY\_GC04\_7371 | 0.346 | 0.002 | Almost identical to the previous image |
| GRAY\_GC04\_7372 | 0.347 | 0.001 | Almost identical to the previous image, however, slightly patchier |
| GRAY\_GC10\_20170208\_104521 | 0.359 | 0.001 | The noise is a lot smoother in this image compared to the others |

3. Conclusions

From the first part of the assignment, I’ve learned that different color spaces interpret colors in different ways. For example, RGB describes color as percentages of red, green and blue, whereas HSV describes color in terms of hue, saturation and brightness. Thus, color spaces can provide different ways of emphasizing color, depending on the user’s purpose.

In the second part of the assignment, it can be seen how different angles and positioning of the camera as well as flash can affect the lighting of the same gray card.