HPC - 2.6.1

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Spring 2024

In this assignment, we explored the CIECAM02 color appearance model, focusing on computing the hue quadrature (H) and hue composition (H_c) for given hue angles. The hue quadrature helps to determine the perceived hue angle, while the hue composition provides the percentage contribution of primary hues.

The results for each hue angle are detailed below, including the computed hue quadrature and the percentage compositions of the primary hues.

Hue (degrees)	Hue Quadrature	Blue%	Red%	Yellow%	Green%
8.25	388.0	12.0	88.0	0.0	0.0
92.86	105.4	0.0	0.0	94.6	5.4
115.0	142.0	0.0	0.0	58.0	42.0
245.56	303.8	96.2	3.8	0.0	0.0

Hue quadrature is computed from

$$H = H_i + \frac{100\,\frac{h - h_i}{e_i}}{\frac{h - h_i}{e_i} + \frac{h_{i+1} - h}{e_{i+1}}}$$

and hue composition is calculated as follows:

$$H_c^i = \frac{\frac{h-h_i}{e_i}}{\frac{h-h_i}{e_i} + \frac{h_{i+1}-h}{e_{i+1}}} \times 100$$

and

$$H_c^{i+1} = \frac{\frac{h_{i+1}-h}{e_{i+1}}}{\frac{h-h_i}{e_i} + \frac{h_{i+1}-h}{e_{i+1}}} \times 100$$

Where i corresponds to main colors in this table:

	Red	Yellow	Green	Blue	Red
i	1	2	3	4	5
h_i	20.14	90.00	164.25	237.53	380.14
e_i	0.8	0.7	1.0	1.2	0.8
H_i	0	100	200	300	400

So, in summary:

- **Hue=8.25°**: The hue quadrature is 388.0 (as it is below 20.14, this color is between *i=4* and *i=5*) which indicates that this hue is predominantly red with a smaller blue component.
- **Hue=92.86°**: The hue quadrature is 105.4, this angle is primarily yellow (94.6%), with tiny amount of green tint (5.4%).
- **Hue=115.00°**: The hue quadrature is 142.0 and shows a balance between yellow and green, with compositions of 58.0% and 42.0%, respectively. This suggests a color that is in between yellow and green, likely appearing as a yellow-green hue.
- **Hue=245.56°**: The hue quadrature of 303.8 reveals a dominant blue composition of 96.2%, with a minor red component of 3.8%.