Midterm 1

Write a program that estimates the true color of objects in the scene using dichromatic reflectance model:

$$L = L_D + L_S$$

$$L(\lambda, \theta) = L_D(\lambda, \theta) + L_S(\lambda, \theta)$$

$$L(\lambda, i, e, g) = L_D(\lambda, i, e, g) = L_S(\lambda, i, e, g)$$

$$C_L(x_{ij}) = m_D(x_{ij})C_D(X_k) + m_S(x_{ij})C_S$$

Where $x_{ij} \in X_k$ for superpixel $X_k$.

- You need to use a superpixel based segmentation algorithm to segment the image into smaller regions.
- For each pixel inside the superpixel assume $C_D$ is same.
- $m_D$ and $m_S$ for each pixel in the image is different
- $C_S$ for the entire image is the same.

After this step minimize the cost

- $E(m_D, m_S, C_D, C_S) = \sum_{i=1}^{N} \sum_{j=1}^{M} r_{ij}^2$

$$r_{ij} = m_D(x_{ij})\mathrm{C_D(X_k)} + \mathrm{m_S}(x_{ij})\mathrm{C_S} - \mathrm{C_L(x_{ij})}$$

You need to constantly push your project to GitHub.