Aula Prática 2

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1. **RGB color space**
   - Build a function that can display the R, G, B individual components of an image.
   - Hints:
     i. Create 3 new images using objects of type ImagePanel.
     ii. Create 3 button/functions, one per RGB dimension, which processes the visualized image.

2. **HSI color space**
   - Create a function that can display the H, S, I individual components of an image.
   - Hints:
     i. \[ H = \begin{cases} \theta & \text{if } B \leq G \\ 2\pi - \theta & \text{if } B > G \end{cases} \]
     \[ \theta = \cos^{-1} \left( \frac{1}{2} \left( \frac{(R-G)+(R-B)}{(R-G)^2+(R-B)(G-B)} \right)^{1/2} \right) \]
     ii. \[ S = 1 - \frac{3}{(R+G+B)} \min(R,G,B) \]
     iii. \[ I = \frac{1}{3} (R+G+B) \]
     - There are values for which H and S are undefined. Why?

3. **Pseudocolor**
   - Create a function that applies a pseudocolor algorithm to a black and white image. Use any technique you want (intensity slicing, intensity to color)
4. Histograms
   - Build a function that calculates the Intensity (HSI) histogram of an image. This should be displayed on a new window (Frame).
   - Hints:
     i. \( I = (R+G+B)/3 \)
     ii. Change the function `paint (public void paint(Graphics g))` of the new window, that should draw a histogram based on an internal variable of type `int[256]`.
     iii. Use classes from `Java.awt.Graphics: drawLine, drawRect, etc.`