**Automatic gray images colorization based on**

**LAB color space**

The article discusses the challenges of image colorization, where colors are added to black and white images without any knowledge of the original colors. Traditional methods often require extensive human intervention and can be time-consuming, which is why researchers are trying to develop new algorithms for more efficiency.

The proposed automatic method utilizes a reference color image to guide the process, converting both the reference image and the grayscale image into the Lab color space. This approach normalizes the grayscale image’s lightness values and combines them with the reference image’s color channels to create a colorized output.

The effectiveness of this algorithm was evaluated through tests measuring Peak Signal-to-Noise Ratio and visual assessments against known colored images. The results indicate that the method performs well, particularly when the reference image closely matches the contents of the grayscale image. Comparisons with existing algorithms also show that the proposed technique achieves comparable results.