

# **COLORIZATION OF GRAYSCALE IMAGE**

**This thesis is represented in partial fulfillment for the award of the Bachelor of  
Engineering (Hons) Electrical Engineering Universiti Teknologi MARA**

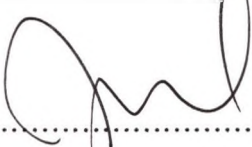


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## **DECLARATION**

It is hereby declared that all the materials in this thesis are the result of my own work and all the materials, which are not result of my own work, have been clearly acknowledgement in this thesis. I certify that the work is original and has not been previously submitted for assessment in other course and institution, except where specifically stated.

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## ABSTRACT

Colorization refers to an image processing task which recovers color of gray scale images when only small regions with color are given. This project introduces a methodology for adding color to grayscale images. Colorization represents a computer-assisted process of adding color to gray-scale still images or monochrome movies. Since the mapping from gray-scale pixel to color pixel is not unique, this process generally requires some user interactions to help confine the color selection.

The project presents a simple yet effective user-guided colorization method. In this method the user only required to annotate the grayscale image with the desired color scribbles in the interiors of the various regions. Two constraints are imposed, one as a constrained least-squares (CLS) which computed the intensity of neighbouring pixels. The other one is linearly constrained quadratic optimization (LCQO) that blends the computed color region in the chrominance images. These constraints are formulated as an optimization problem that automatically propagates the scribbled colors to produce a completely colorized image. The basic premise is that neighbouring pixels having similar intensities in the monochrome data should have similar colors in the chromatic channels. The colorization method requires neither precise manual image segmentation, nor accurate region tracking.