



North South University

Department of Electrical and Computer Engineering

CSE215 Project

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Group no: 05

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Section: 7

Course : CSE 215

Image Processing Application

1. Introduction :

Image Processing Application is a Java-based desktop project that allows users to load, edit, convert, and save photos through the use of a GUI. It will include basic image manipulation functionalities such as photo rotation, application of filters (grayscale), among others, and saving of manipulated images. The major objective is to provide a simple platform on which small image processing tasks can be executed with ease.

2. Features :

Image Load and Display:

- The application allows users to import photographs from their system.
- The program window displays the resized photos that have been loaded.

Filters:

- **Grayscale Filter:** Converts an image into grayscale tones

Transformations :

- **Rotation:** Rotates the image by 90° clockwise.

Image Saving :

- Edited images can be saved to the user's system in the desired location.

Graphical User Interface :

- Images can be loaded, edited, and saved using interactive buttons.
- preview of changes and modifications in real time.

3. Tools and Technologies Used :

- **Programming Language:** Java
- **Libraries:**
 - javax.swing for the GUI
 - java.awt.image for image manipulation
 - java.awt for rendering graphics
 - javax.imageio for handling image input and output

4. Project Workflow :

- 1. Load Image:**

Using a file chooser, users pick an image file from their system.

To fit in the application window, the chosen image is downsized.

- 2. Apply Filter:**

The loaded image can have filters like grayscale applied to it.

The exhibited image is updated in real time by the program.

- 3. Apply Transformation:**

Rotation and other transformations are applied, and the results are instantly reflected.

- 4. Save Image:**

Users can save the modified image in the format of their choice to their computer.

5. Observed Shortcomings :

Despite the provided functionality, the project has the following drawbacks:

- 1. Image Rotation Issue:**

The rotated image occasionally fails to display properly.

The dimensions and alignment post-rotation are often inconsistent.

- 2. Image Not Saving After Edits:**

Edited images do not save accurately.

The file format is not consistently applied when saving.

- 3. Limited Features:**

Currently, only a grayscale filter is available; additional options such as sepia or brightness adjustments are absent.

Other transformations, including flipping or cropping, are not offered.

- 4. User Experience Issues:**

The absence of undo/redo functionality for edits is noticeable.

Buttons remain active even when no image is uploaded.

7. Conclusion :

The Image Processing Application showcases Java's potential in creating GUI-based applications for manipulating images. Nevertheless, the recognized limitations—such as problems with rotation, the saving function, and a lack of features—need to be resolved to enhance both usability and functionality. By applying the suggested fixes and improvements, the application's performance and user satisfaction will be greatly improved.