

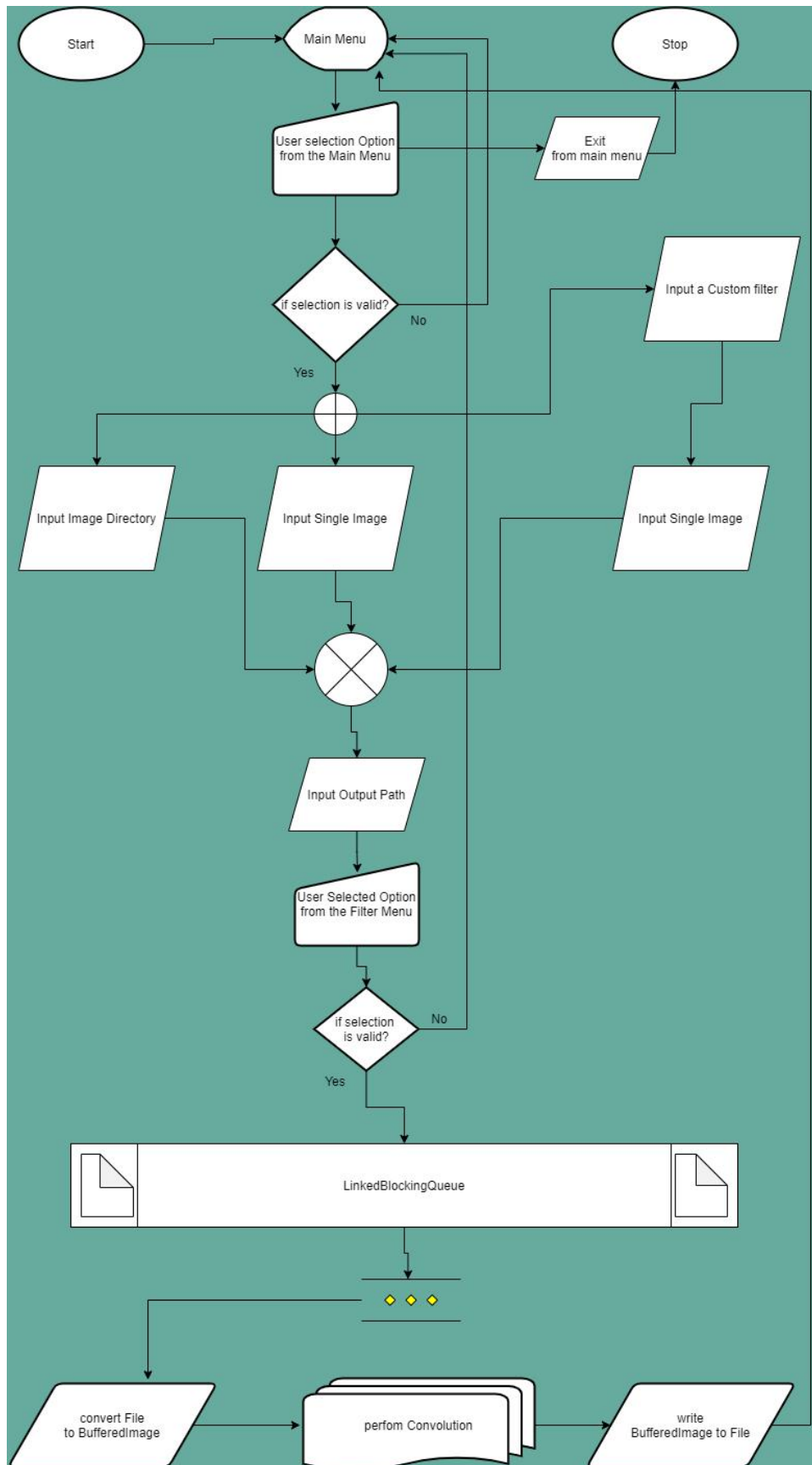
Table of Contents

General Info.....	2
Flowchart.....	3
UML Class Diagram.....	4
Features.....	5
Screen-shots.....	6

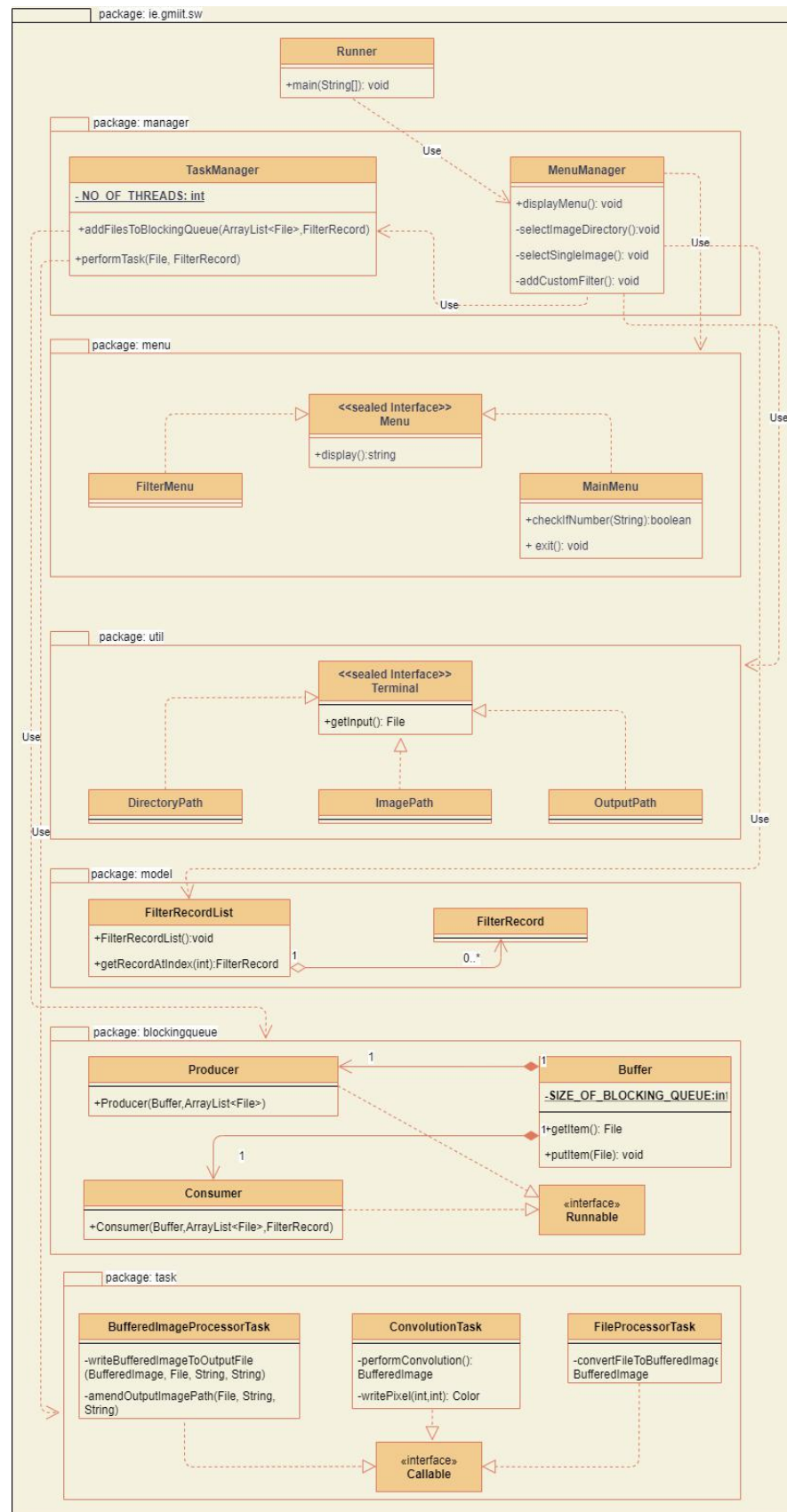
General Info

Types/Data Structure used in the Application	Description
Record	To store filterId, filterName, filterMatrix
Enum	To store valid image type like gif, jpg, png
Scanner	To accept input from the user
ArrayList	To store list of files
LinkedBlockingQueue	Bounded queue that is thread safe, to insert and remove files
2D Array	To store kernel matrix
Runnable	Implemented by class, whose instance is to be executed by thread
Callable	Implemented by class, executed by thread and returns a results
Future	To handle the result of the asynchronous task
ExecutorService	Submit and execute the asynchronous task.
Switch	Execution of case block based on the user selection

Flowchart



UML Class Diagram



Features

Feature	Description
Formatted and Recurring Main Menu	Provides 4 options at the main menu and ask for user choice, and keeps repeating until user select exit option.
Formatted Filter Menu	Provides a list of 10 filters to be applied on the image.
InputMismatchException gracefully handled for menu options	If the user enters any character other than a number specified In the menu, it will a show a appropriate message, and program will not be terminated.
Accepts only Valid Image files	It accepts only GIF, PNG and JPG image file and it will show a appropriate message, if any other type of file is entered.
Accepts Image Directory	It accepts and check if the directory exist or not, displays a appropriate message
Accepts Single Image	It accepts and check for the valid image type and check if the file exist or not.
Accepts output path	It accepts a output path, where the image will be saved.
Accepts a custom filter matrix	It accepts a custom kernel matrix size and its element, stores it in a double dimensional array
Append filter name to the output image file	It appends the selected filter name to the output file name

Screen-shots

Option 1: Enter Image directory

```

Welcome To Image Filtering_System

1. Enter Image directory
2. Select Single Image
3. Add a Customer Filter
4. Exit

Enter Choice:1
Enter Input Image Directory
c:\input
Enter Output path
c:\output

Select Filter to Apply on Image

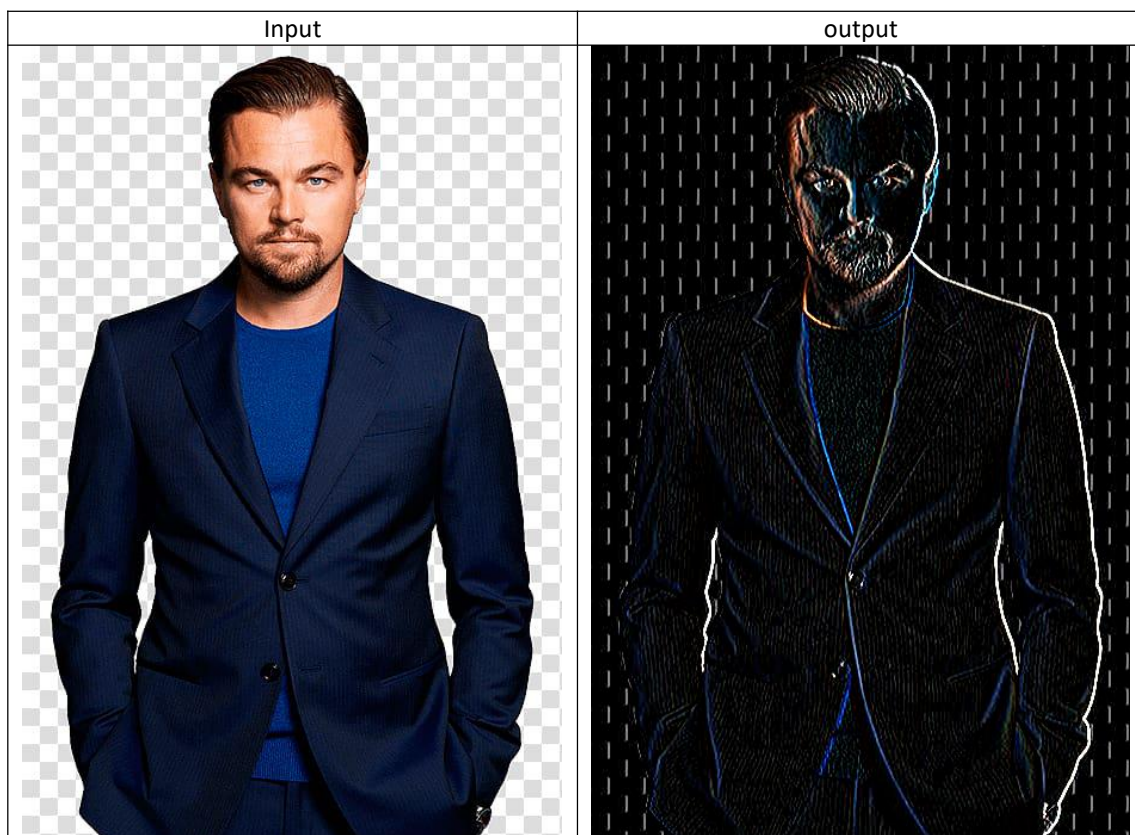
1. Identity Filter          6. Vertical Lines Filter
2. Edge Detection Filter   7. Diagonal Lines Filter
3. Laplacian Filter        8. Sobel Horizontal Filter
4. Sharpen Filter          9. Sobel Vertical Filter
5. Horizontal Lines Filter 10. box Blur Filter

Enter Choice:2
[*] Rendering the image...
[->] Output File::c:\output\art_EdgeDetection1_Filter.jpg
[*] Rendering the image...
[->] Output File::c:\output\leo_EdgeDetection1_Filter.jpg
[*] Rendering the image...
[->] Output File::c:\output\qrcode_57_EdgeDetection1_Filter.png
  
```



Option 2: select single Image

```
-----
                        Welcome To Image Filtering_System
-----
1. Enter Image directory
2. Select Single Image
3. Add a Customer Filter
4. Exit
-----
Enter Choice:2
Enter Input Image path
"C:\input\leo.jpg"
Enter Output path
c:\output
-----
                        Select Filter to Apply on Image
-----
1. Identity Filter           | 6. Vertical Lines Filter
2. Edge Detection Filter    | 7. Diagonal Lines Filter
3. Laplacian Filter         | 8. Sobel Horizontal Filter
4. Sharpen Filter          | 9. Sobel Vertical Filter
5. Horizontal Lines Filter  | 10. box Blur Filter
-----
Enter Choice:8
[*] Rendering the image...
[->] Output File::c:\output\leo_Sobel_Horizontal_Filter.jpg
```



Option 3: add a custom Filter

```
-----  
Welcome To Image Filtering_System  
-----  
1. Enter Image directory  
2. Select Single Image  
3. Add a Custom Filter  
4. Exit  
-----  
Enter Choice:3  
Enter the Size of Kernel Matrix  
2  
Enter value at index(0)(0):1  
Enter value at index(0)(1):0  
Enter value at index(1)(0):1  
Enter value at index(1)(1):0  
Enter Input Image path  
"C:\input\leo.jpg"  
Enter Output path  
c:\output  
[*] Rendering the image...  
[->] Output File::c:\output\leo_Custom_Filter.jpg
```



Option 4: exit

```
|-----|
|           Welcome To Image Filtering_System           |
|-----|
| 1. Enter Image directory                               |
| 2. Select Single Image                               |
| 3. Add a Custom Filter                               |
| 4. Exit                                               |
|-----|
Enter Choice:4
Program Terminated
```

Not a number : entered any character instead of numbers

```
|-----|
|           Welcome To Image Filtering_System           |
|-----|
| 1. Enter Image directory                               |
| 2. Select Single Image                               |
| 3. Add a Custom Filter                               |
| 4. Exit                                               |
|-----|
Enter Choice:x
Invalid Choice: not a number
```

Invalid choice

```
|-----|
|           Welcome To Image Filtering_System           |
|-----|
| 1. Enter Image directory                               |
| 2. Select Single Image                               |
| 3. Add a Custom Filter                               |
| 4. Exit                                               |
|-----|
Enter Choice:9
Invalid Choice
```

Not a image file: entered a pdf file

```
|-----|
|           Welcome To Image Filtering_System           |
|-----|
| 1. Enter Image directory                               |
| 2. Select Single Image                               |
| 3. Add a Custom Filter                               |
| 4. Exit                                               |
|-----|
Enter Choice:2
Enter Input Image path
"C:\input\README.pdf"
Not an Image File.
```

File does not exist:

```
|-----|
|               Welcome To Image Filtering_System               |
|-----|
| 1. Enter Image directory                                       |
| 2. Select Single Image                                         |
| 3. Add a Custom Filter                                         |
| 4. Exit                                                         |
|-----|
Enter Choice:2
Enter Input Image path
"C:\input\noimage.png
File does not exist: "C:\input\noimage.png
```