

UNIVERSITI TEKNOLOGI MALAYSIA

PRESENTATION SLIDE

Image Restoration Browser Extension to Reverse Image Filtering

Name: Kristy Yap Jing Wei

Matric No.: A21EC0191

Course: 3 SECVH

Supervisor's Name: Dr. Pang Yee Yong

Video Link: <https://youtu.be/R4dwVPu4Ej8>

Overview

- 01 PROBLEM BACKGROUND
- 02 PROJECT AIM
- 03 PROJECT OBJECTIVES
- 04 PROJECT SCOPES
- 05 LITERATURE REVIEW
- 06 SYSTEM DEVELOPMENT METHODOLOGY
- 07 REQUIREMENTS ANALYSIS AND DESIGN
- 08 PSM 2 EXECUTIVE PLAN
- 09 CONCLUSION

CHAPTER 01

INTRODUCTION

Problem Background

On social media, images are often enhanced and filtered to create a favorable impression, which can hide information and damage authenticity. This manipulation can facilitate deceptive behaviors, such as spreading fake information and false advertisements. Individuals and businesses use these filtered images to attract more engagement and customers, respectively. However, this makes it challenging for users to identify tampered images and reverse image filtering systems are not widely available or understood. To address this, a browser extension for reverse image filtering is proposed to help users verify image authenticity on social media.

Project Aim

This project aims to develop an image restoration browser extension to reverse image filtering.

Project Objectives



To investigate a mathematical algorithm that can reverse the image filtering and restore the original image.

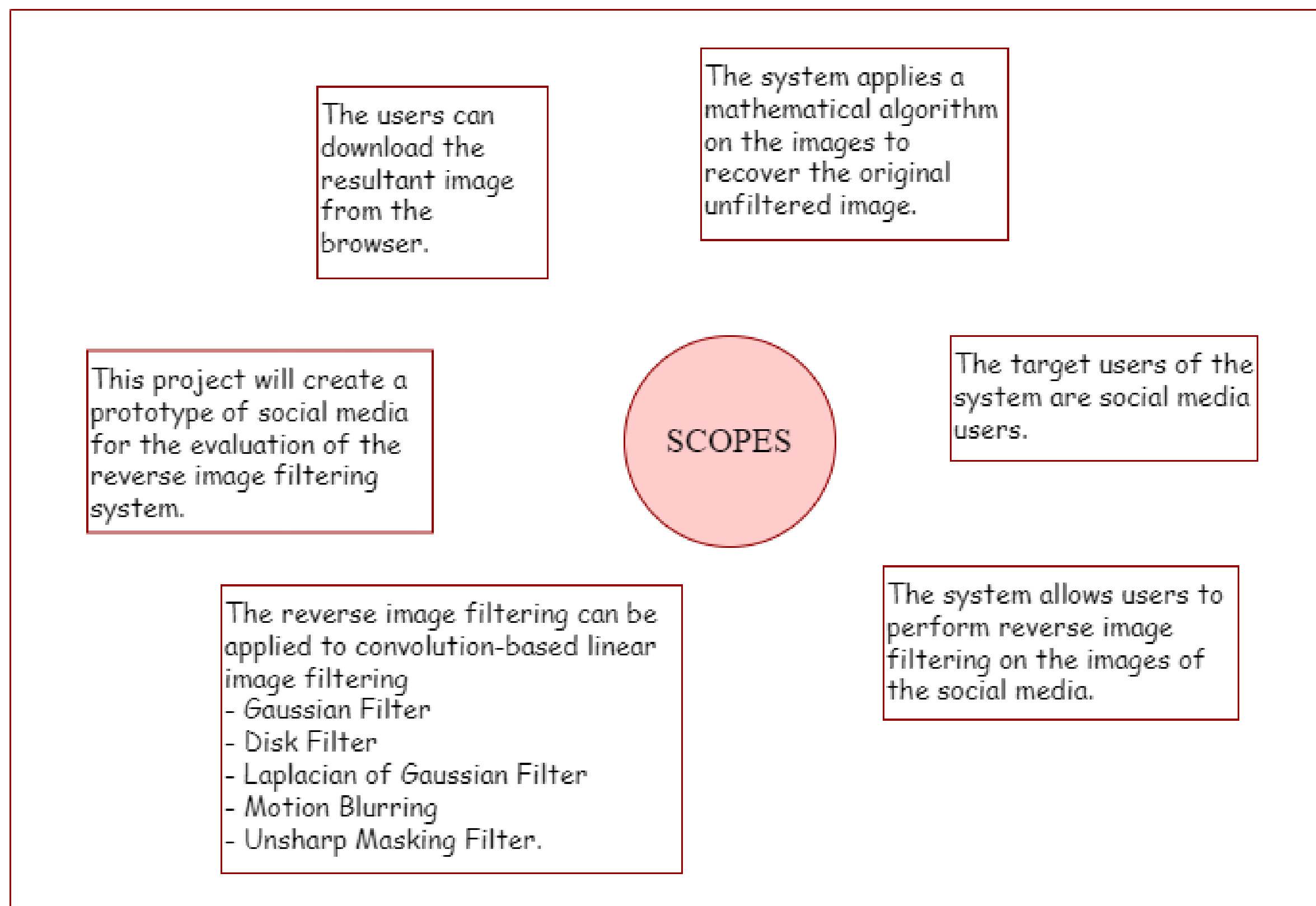


To design an image restoration browser extension based on the requirements collected from the social media users.



To test and evaluate the accuracy of the image restoration browser extension in reversing the image filtering.

Project Scopes



CHAPTER 02

LITERATURE REVIEW

Reverse Image Filtering Techniques

Techniques	Strengths	Limitations
Zero-Order Reverse Filtering	Easy to implement, fast speed, low computational cost	Not accurate for complex filters or significant distortions, less adaptable
Iterative First-Order Reverse Image Filtering	High accuracy, good adaptability	High computational cost
Total Derivative Approximation (TDA) and Accelerated Gradient Descent (AGD)	High precision, high efficiency	High complexity
Landweber-like Iteration Method	High robustness, high versatility	High complexity

Current Existing System

Systems	Strengths	Limitations
Snapseed	Free of cost, User-friendly interface, Comprehensive editing tools	No web version, Storage and performance
BunnyPic	Easy to be access from any device	Performance depends on Internet, Need Internet connection, Free and premium feature
Fotor	Cross-platform devices, Easy to use, Variety of templates and filters	Free and premium feature, Lack of precision of more advanced editing tools

Comparison of Strengths and Limitations between the Current Existing System.

Browser Extensions

01

Browser extension is written in HTML, CSS, or JavaScript. It aims to enhance web browsers by adding features like content translation, ad blocking, and website functionality improvements, thereby enriching the browsing experience.

02

Google Chrome extension is available from the Chrome Web Store and can enhance user experience and security by adding functionalities to the browser. It runs in a secure, sandboxed environment and utilizes the Chrome Extension API for development.

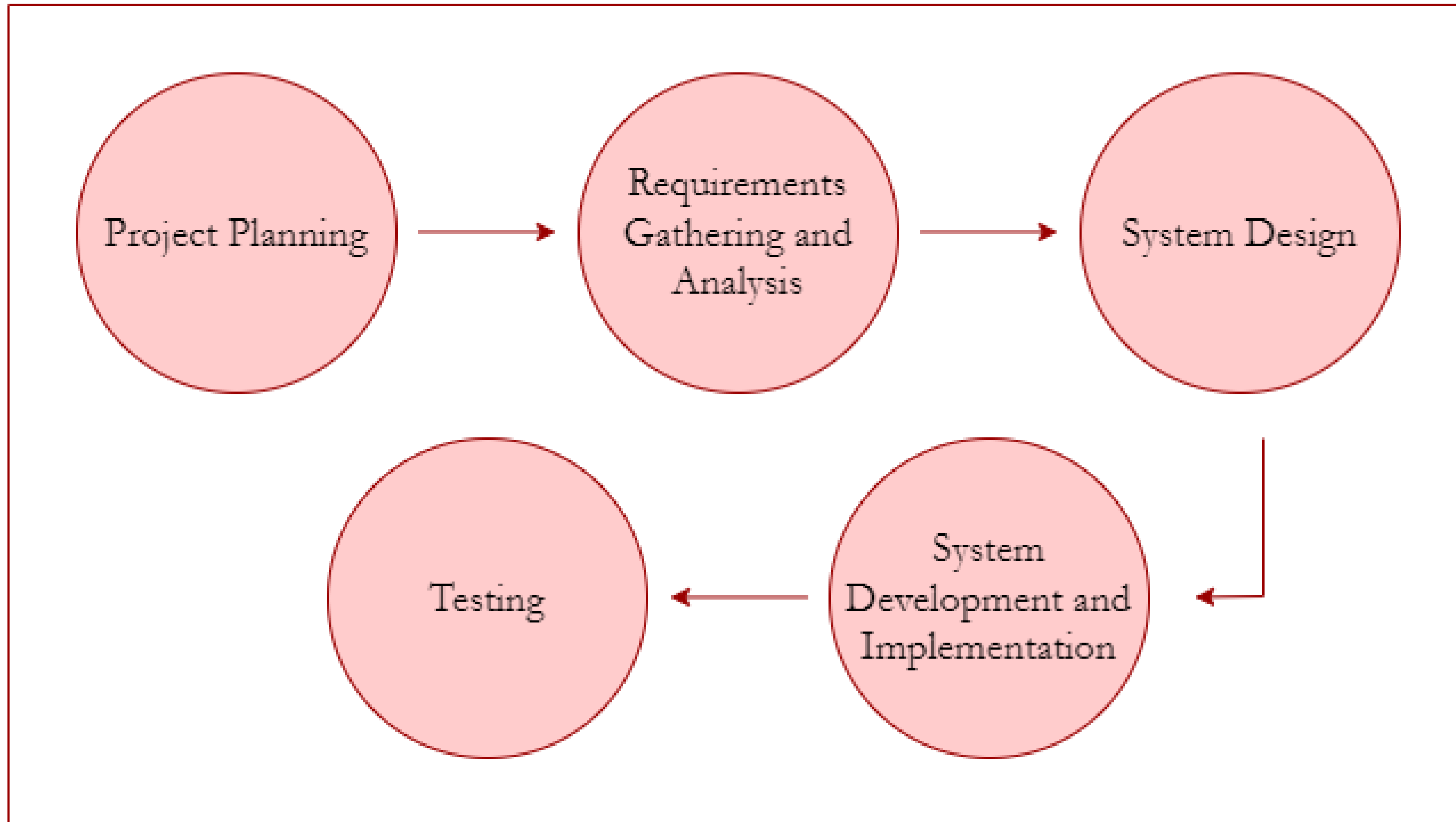
03

The Pixlr Editor extension illustrates how browser extensions can offer advanced tools, such as image editing, directly within the browser. It allows users to edit images with professional-level capabilities without needing standalone software.

CHAPTER 03

SYSTEM DEVELOPMENT METHODOLOGY

Agile Methodology



Project Planning

- Project flow is scheduled in Gantt Chart.
- To define the objectives and scope of the project.
- To define problem background and proposed solution.
- To study and research for the techniques required.

- Conduct a survey with social media users to collect their insights and opinion on reverse image filtering techniques.
- To gather users requirements in order to define the functional and nonfunctional requirements.

Requirements Gathering and Analysis

System Design

- Design use case diagram, system architecture, database and user interface (UI).
- Serve as a guideline in the next phase.

System Development and Implementation

- Develop the proposed image restoration browser extension to reverse image filtering.
- Develop a social media prototype for testing.

Testing

- Test the accuracy of the system by checking the similarity between input and result image.
- Conduct UAT to ensure that the system is accepted by the target users.

Technologies Used

01 Visual Studio Code (VS Code)

02 HTML, JavaScript, CSS

03 Python

04 OpenCV

05 Git Hub

06 Firebase

Hardware and Software

Hardware Requirements

Hardware	Usage
Laptop	Research
	Documentation
	Coding
	Project implementation

Software Requirements

Software	Functionality
Visual Studio Code	Project development
Jira	Project management
Draw.io	Creating UML diagram
Microsoft Word	Documentation
Google Chrome	Browser extension

CHAPTER 04

Requirement Analysis and Design

Survey Results

01

- Google Form
- 10 questions

02

Target
respondents:
Social Media
Users

03

receive 30
responses (social
media users of
different age)

04

83.3% of
respondents
experienced
online image
fraud.

05

only 36.7% respondents experienced
with remove image filters application or
system before (eg: Snapseed, Photo
Editor Pro, Fotor, Adobe Photoshop).

06

96.7% of respondents agree with the
system role of checking the
authenticity of online image.

07

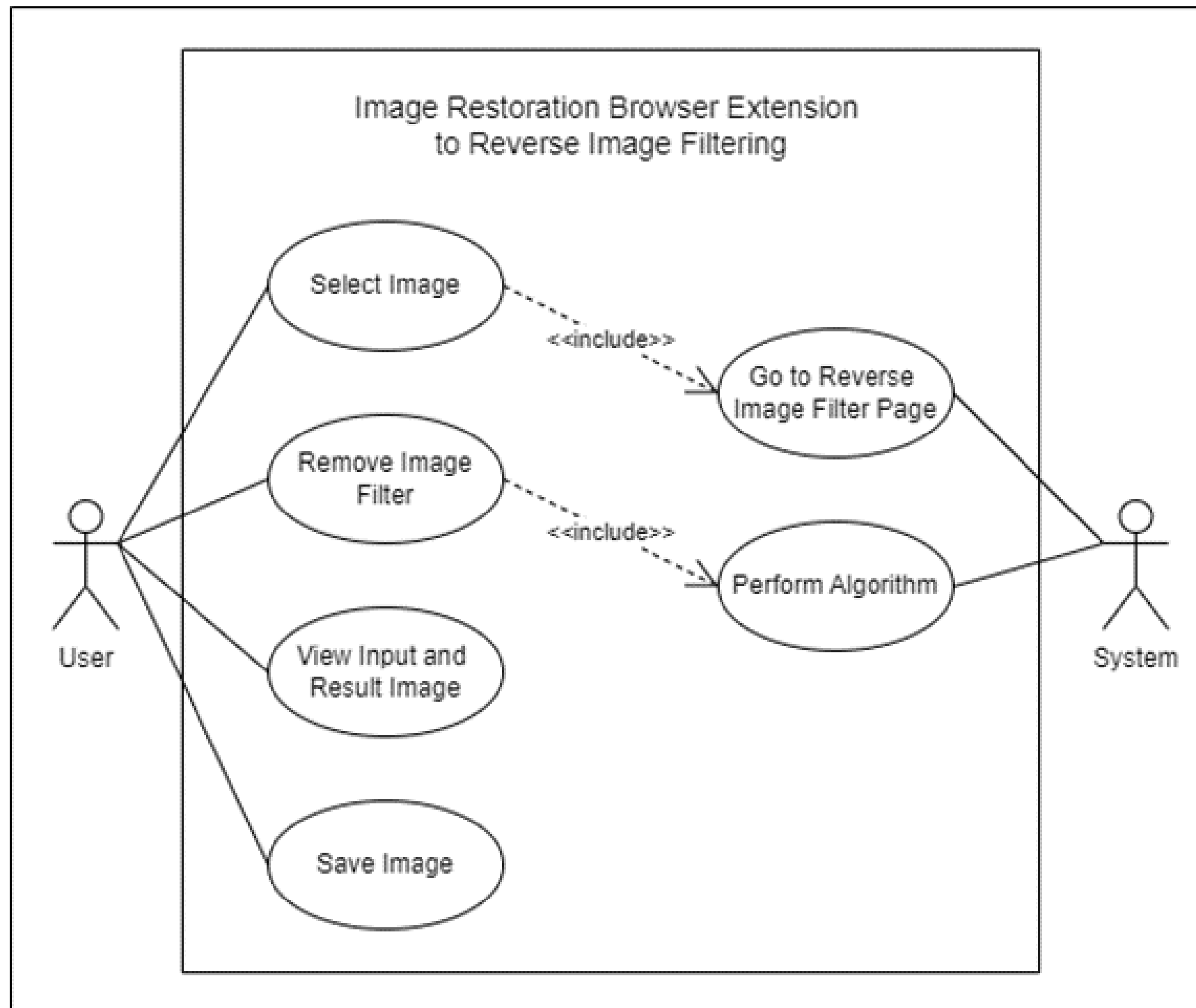
96.6% of respondents are likely to use
the reverse image filtering system if
they access to such a tool.

08

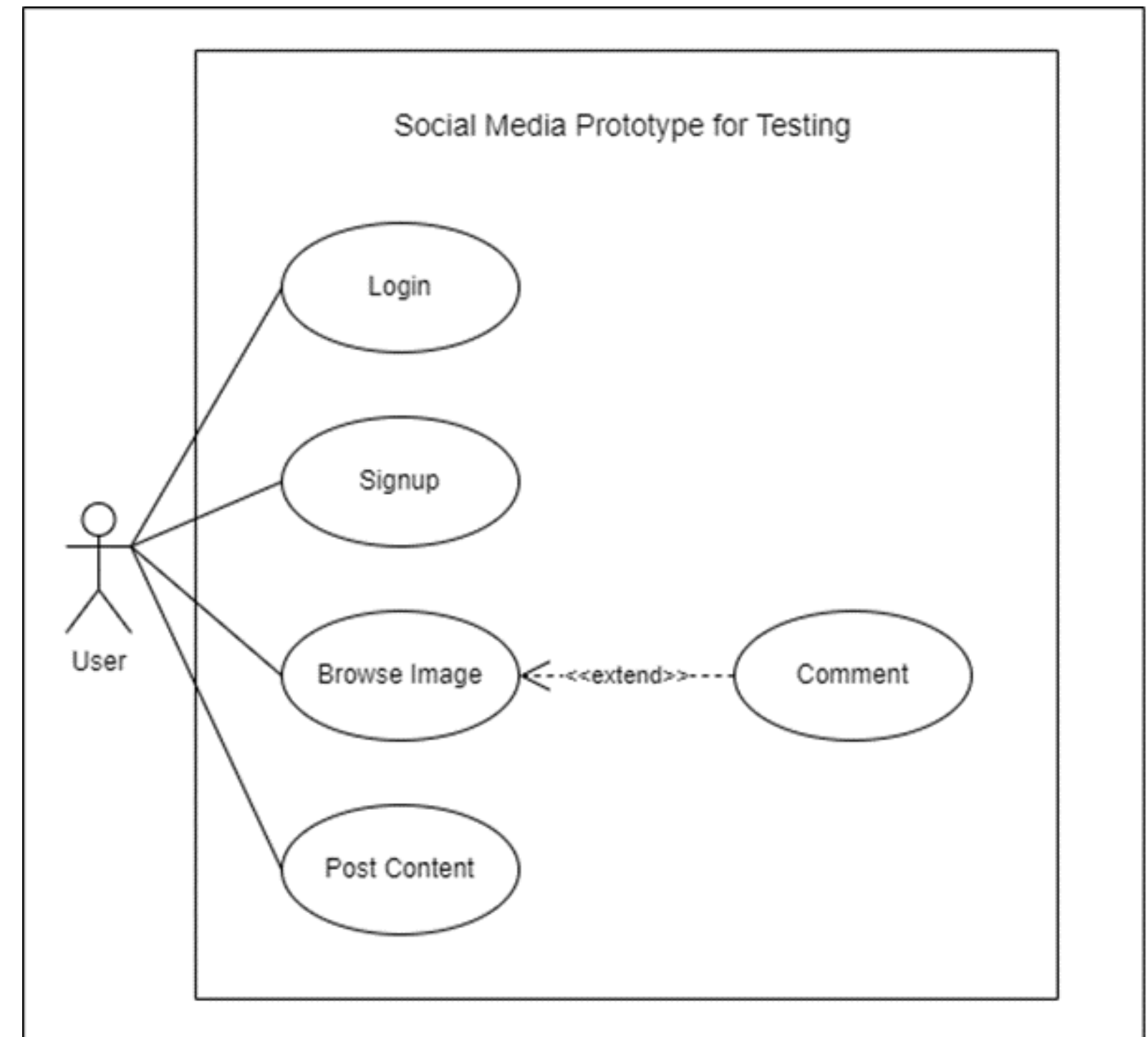
This questionnaire results suggest a
strong interest and need for the reverse
image filtering system that can remove
or undo the image filters

Use Case Diagram

Image Restoration Browser Extension

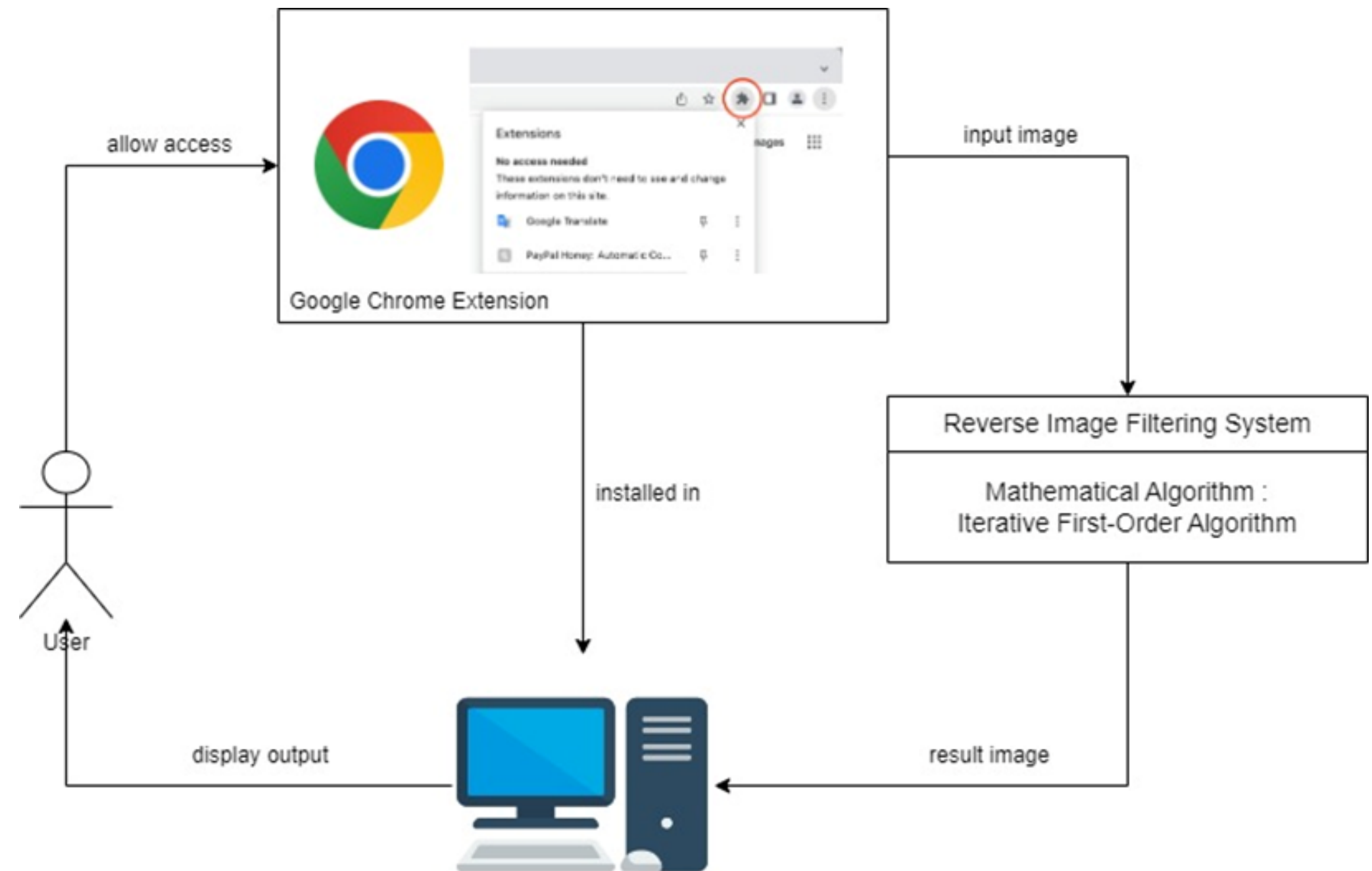


Social Media Prototype for Testing



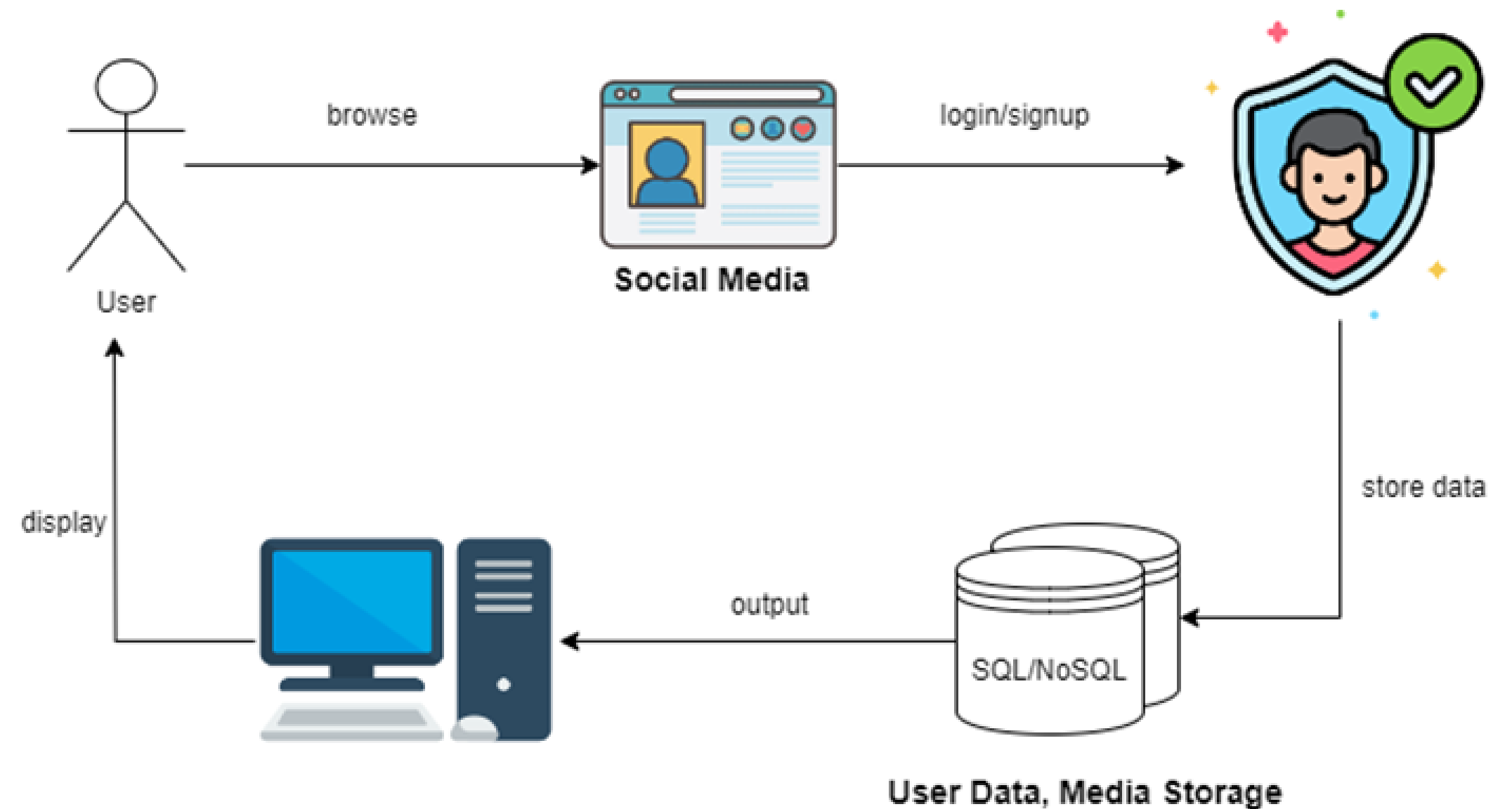
System Architecture Design

- Image Restoration Browser Extension



System Architecture Design

- Social Media Prototype for Testing



ERD

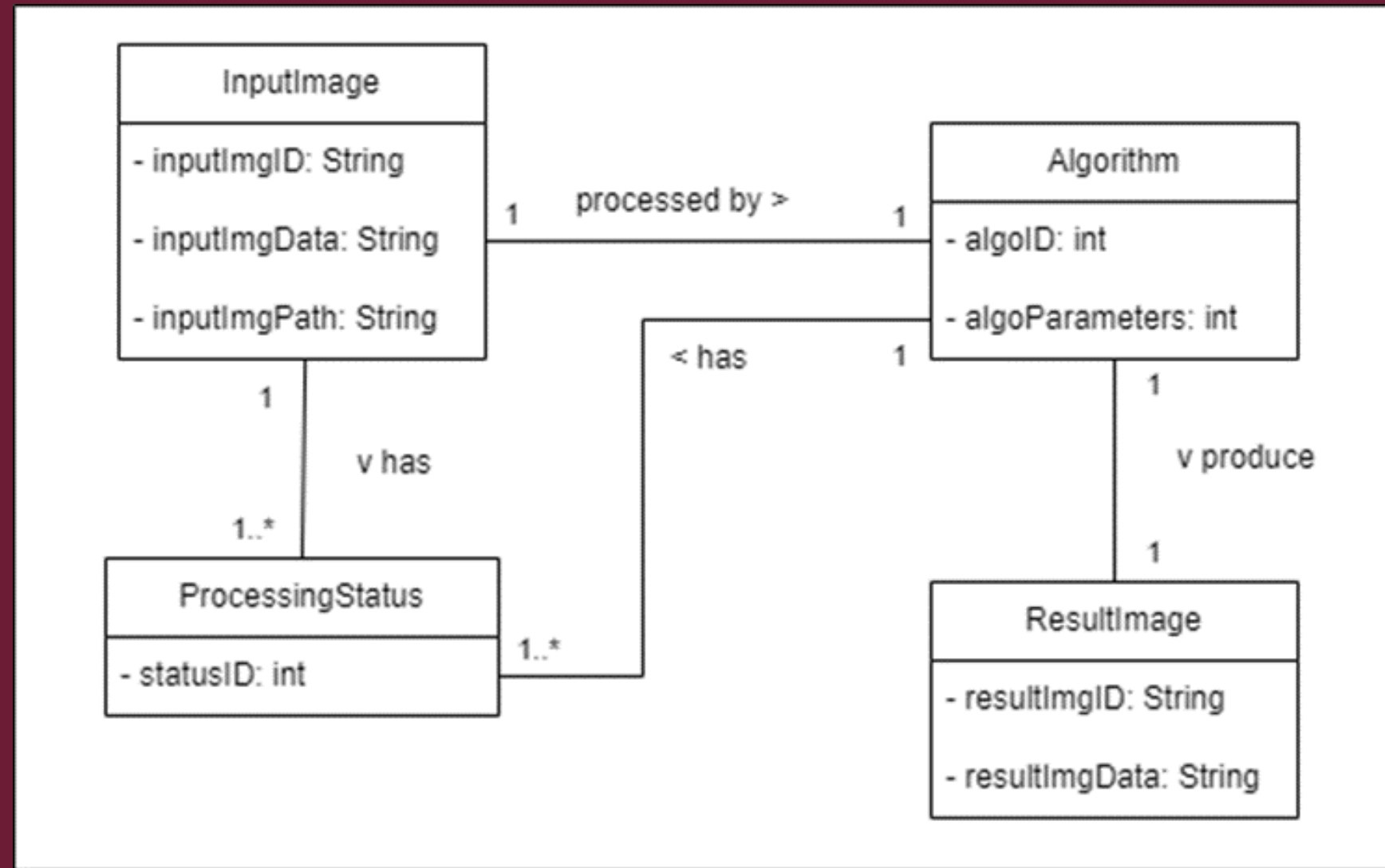
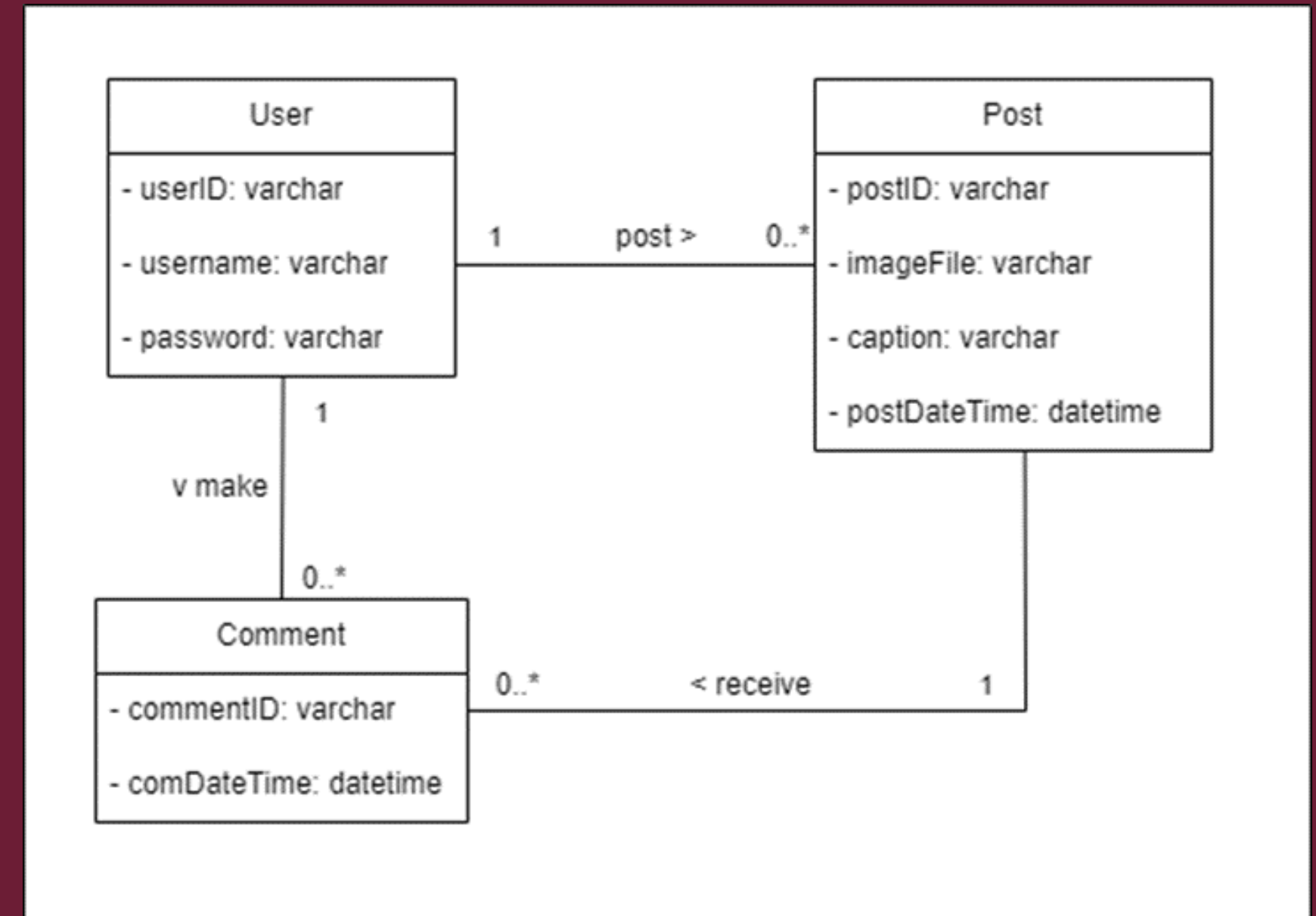


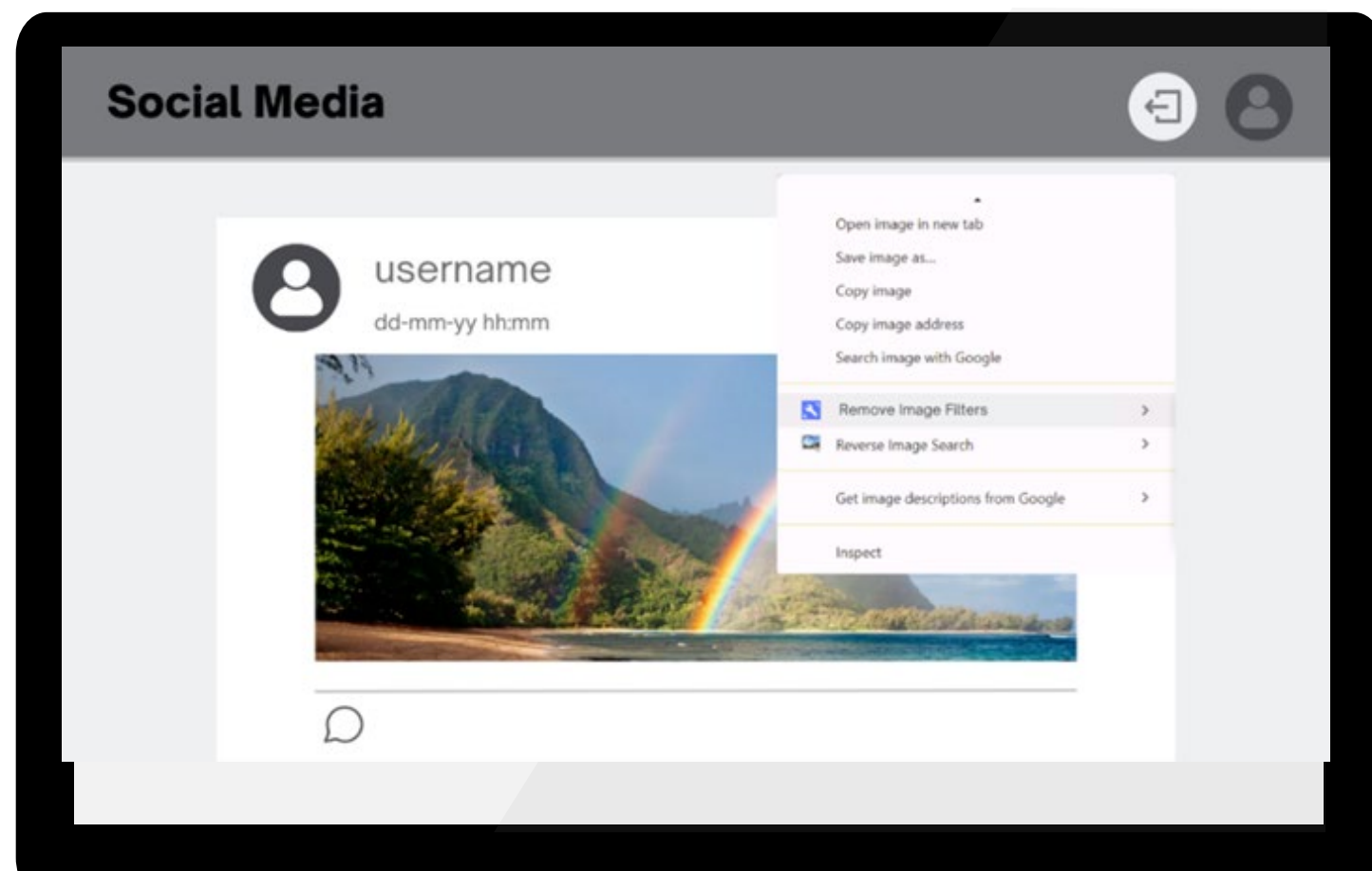
Image Restoration Browser Extension



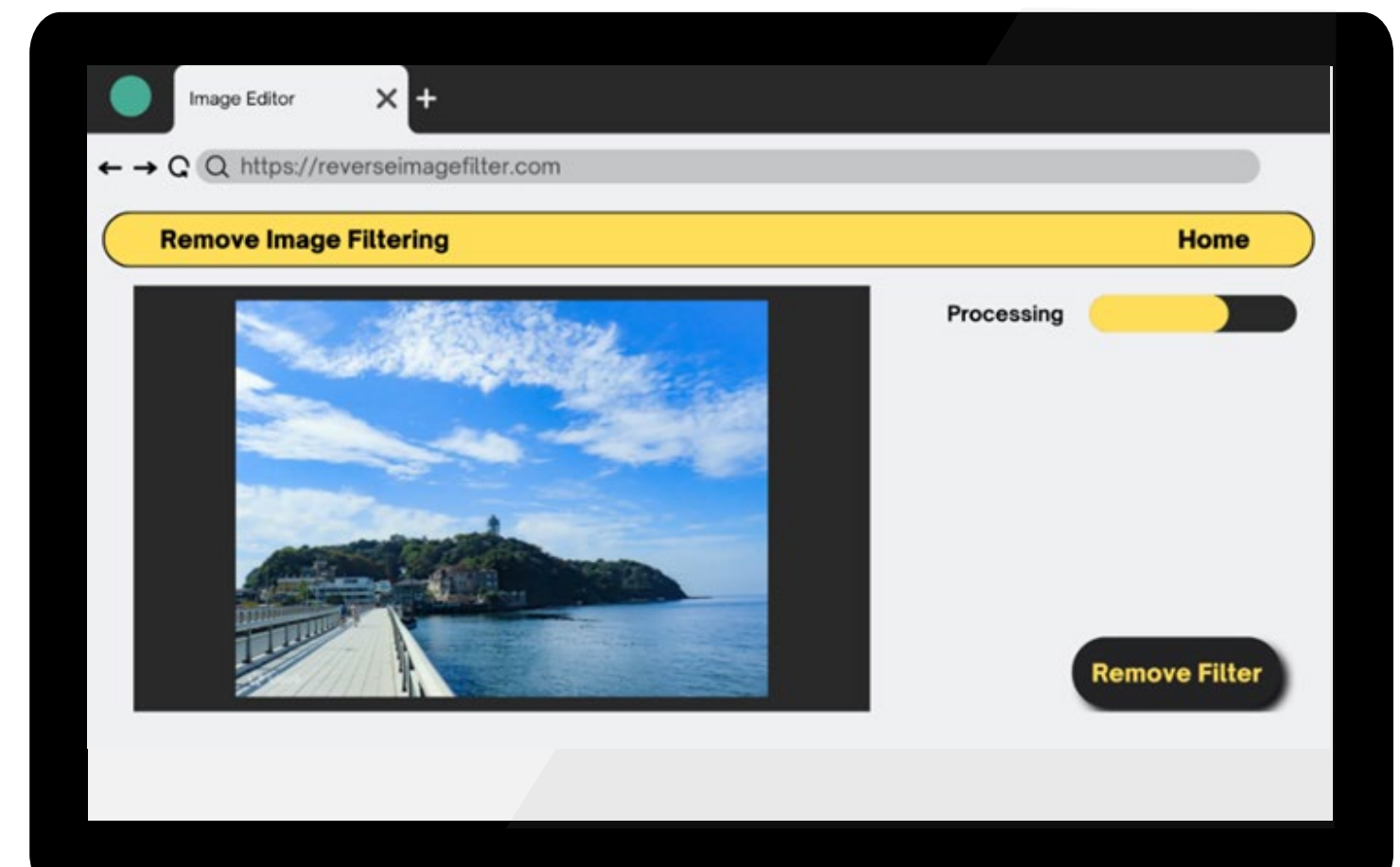
Social Media Prototype for Testing

User Interface Design

Image Restoration Browser Extension



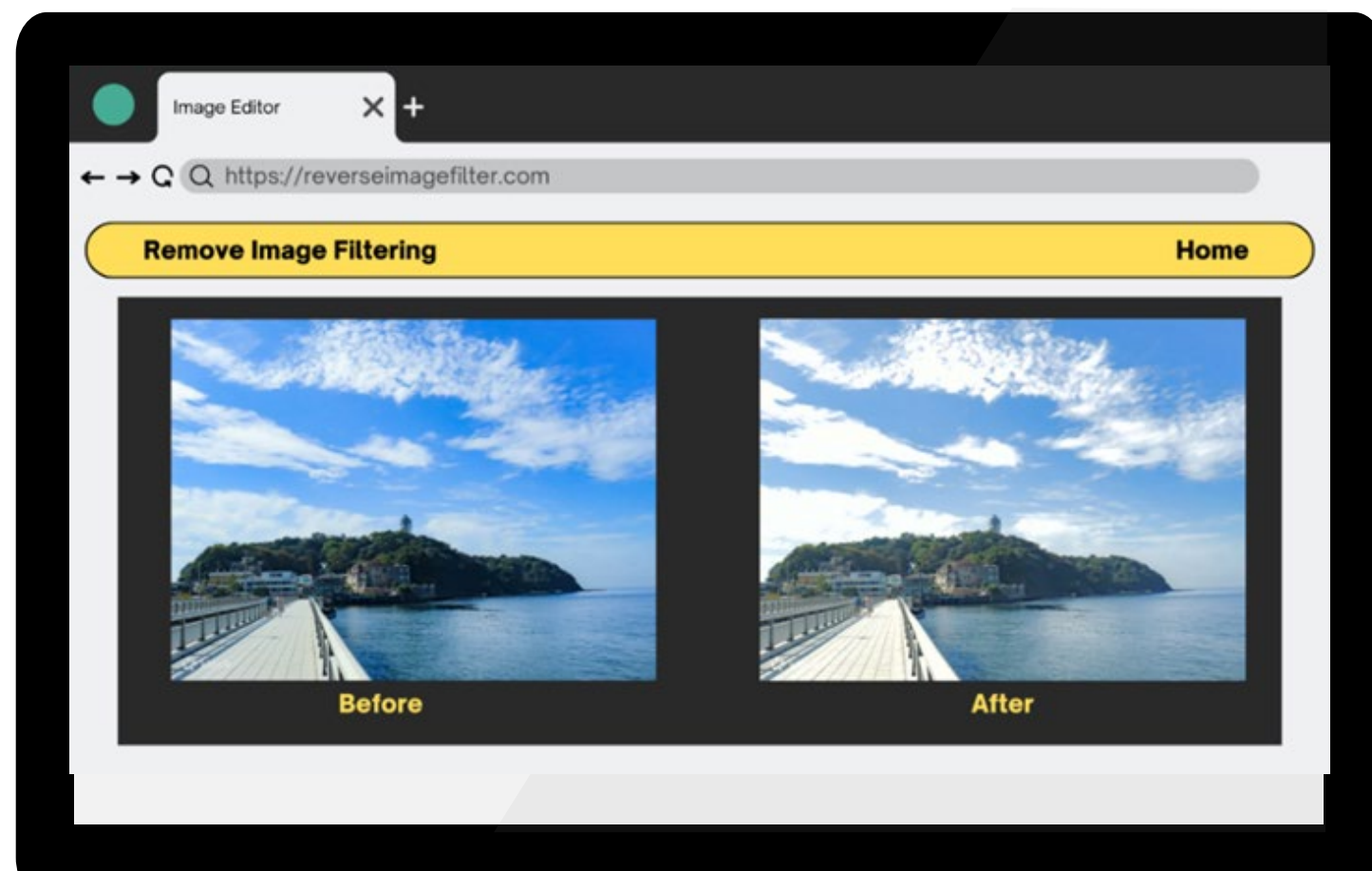
Browse and Select Image Page



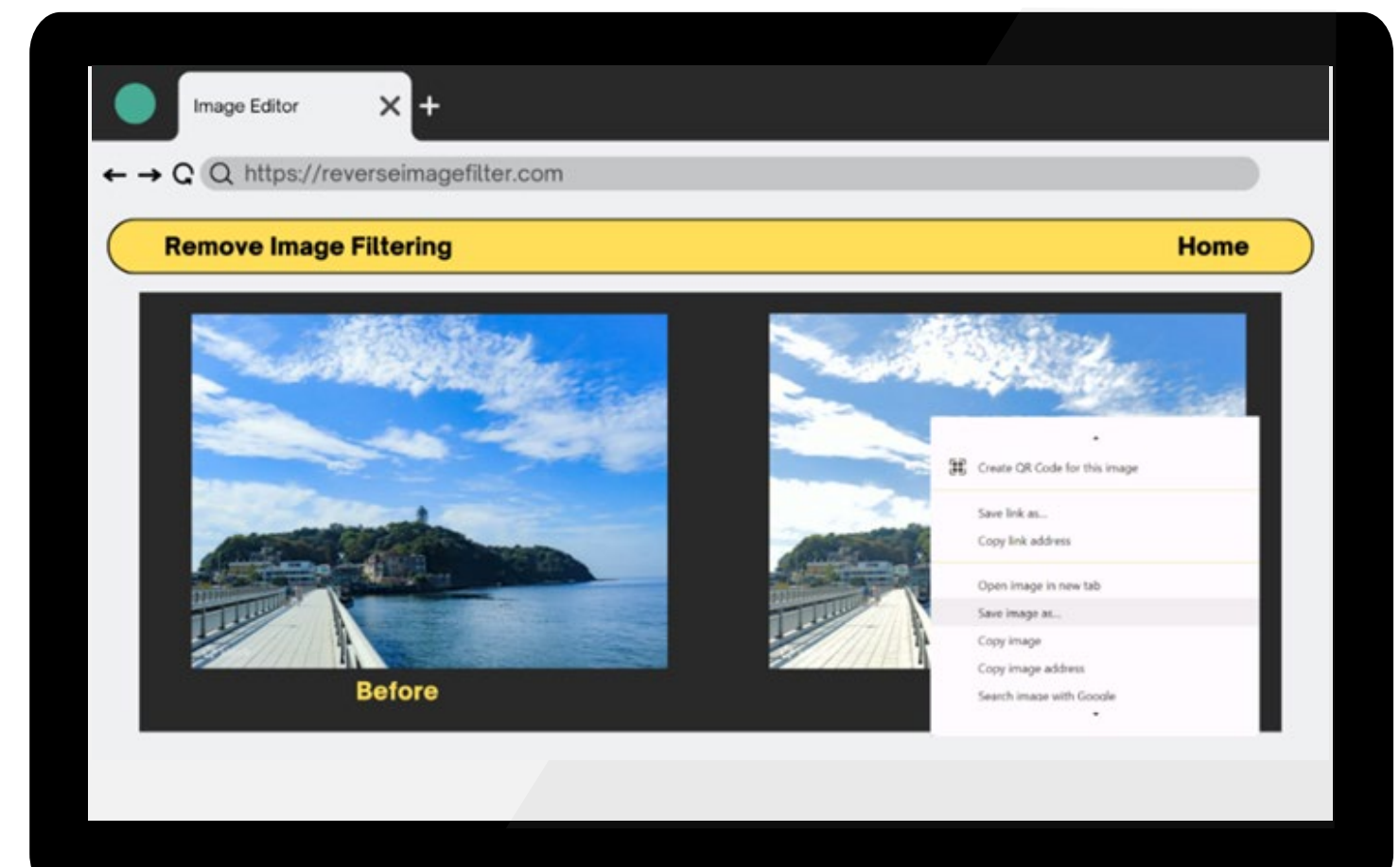
Reverse Image Filtering Page

User Interface Design

Image Restoration Browser Extension



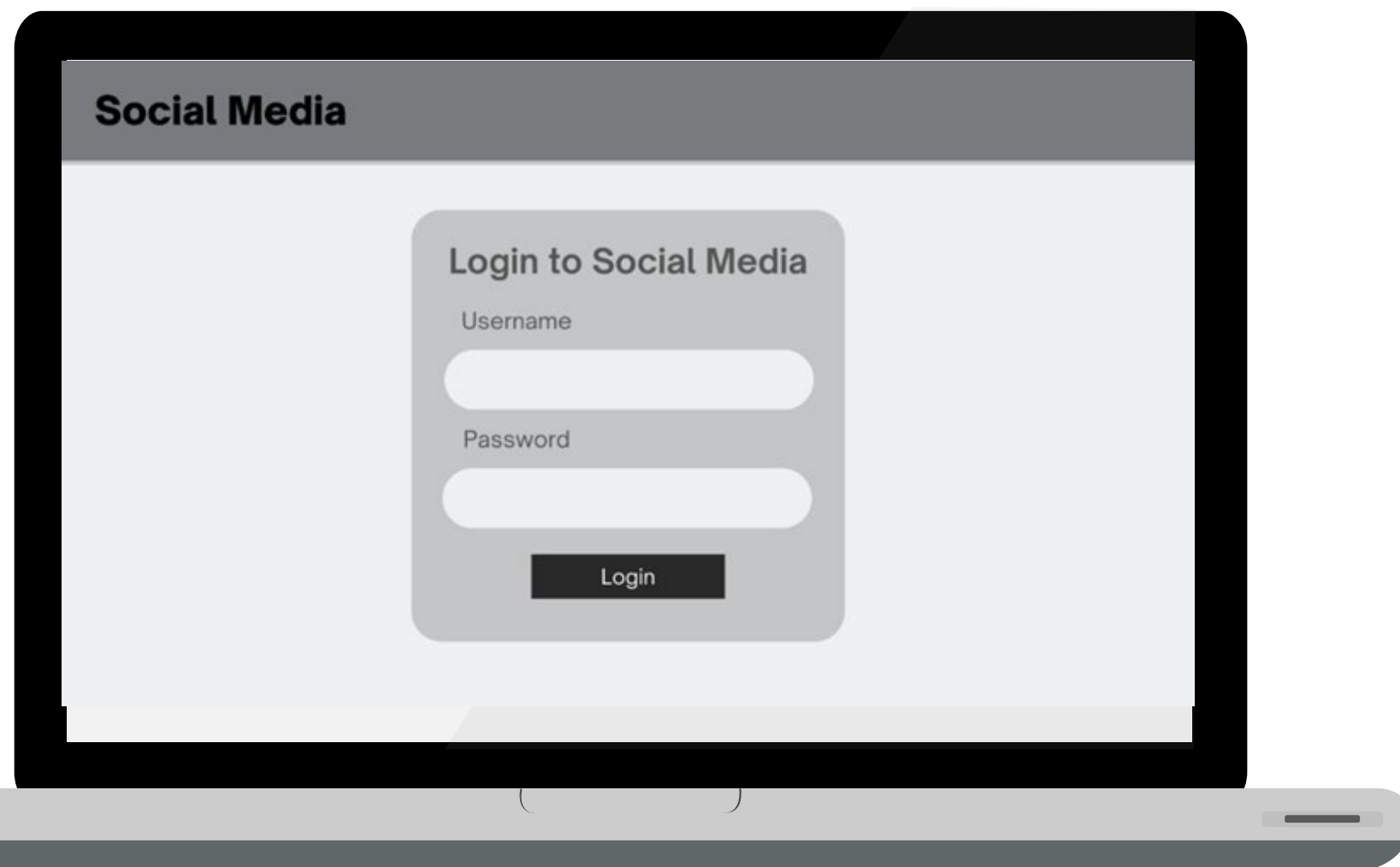
View Input and Result Image Page



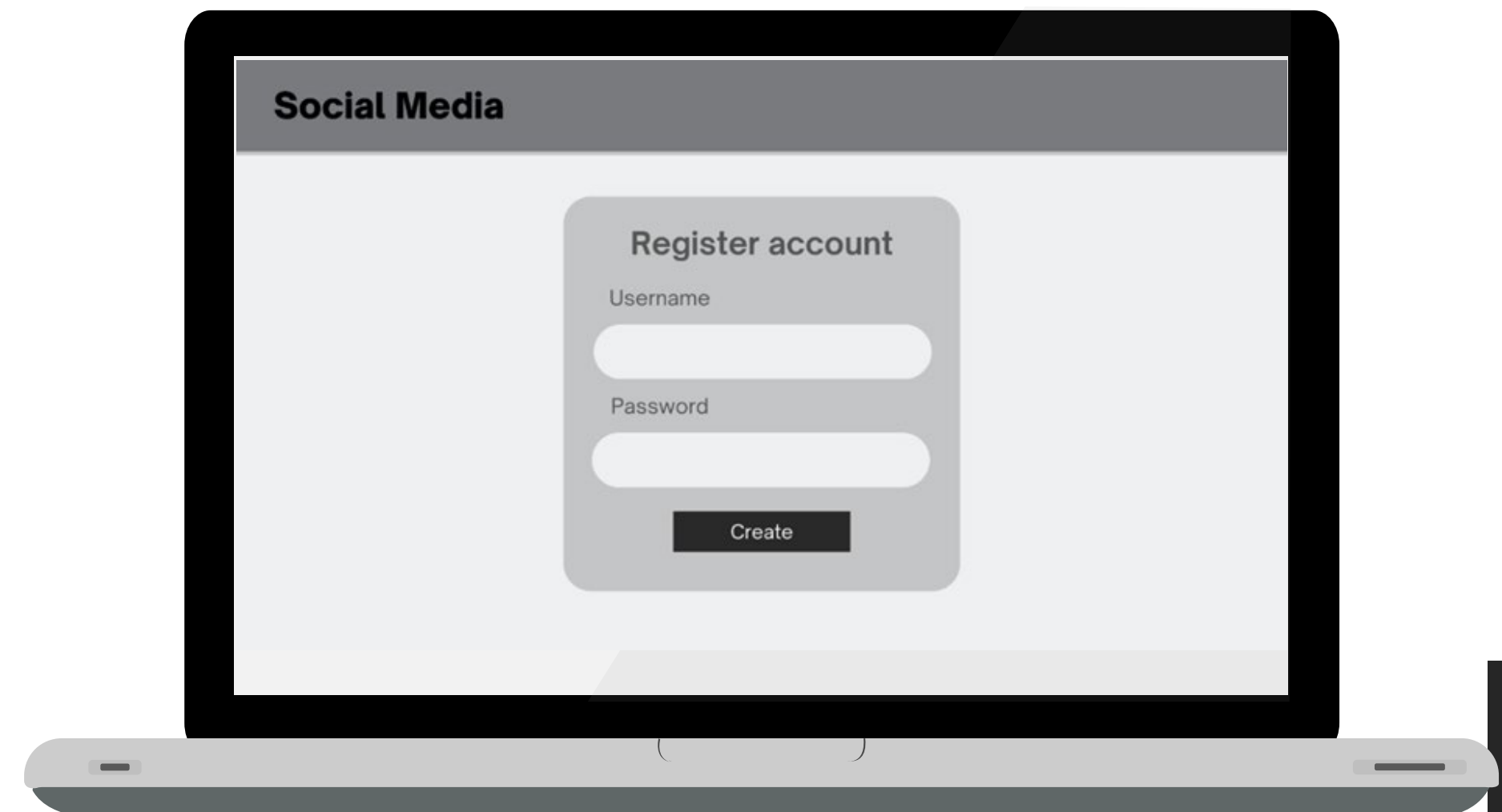
Save Image Page

User Interface Design

Social Media Prototype for Testing



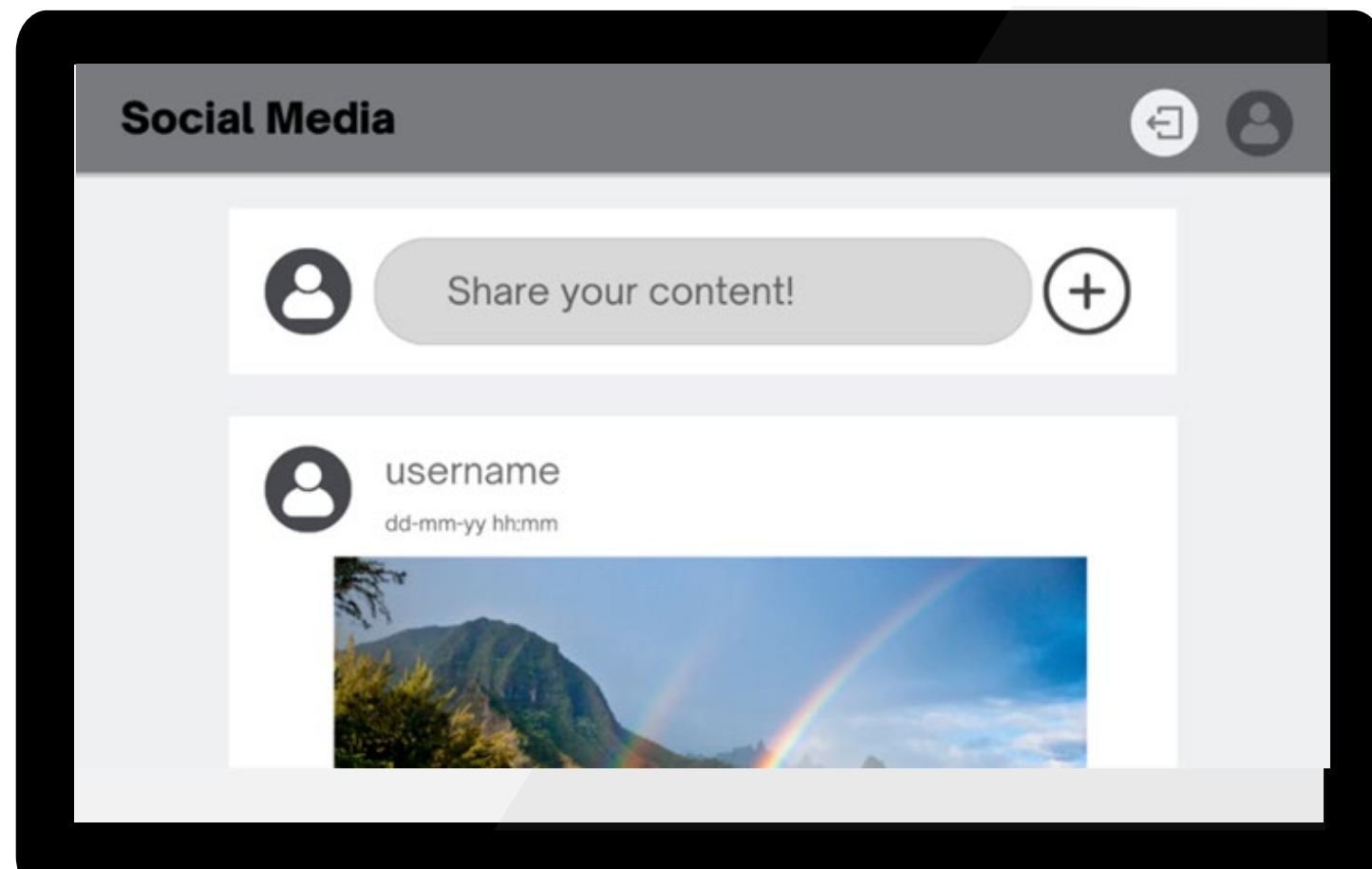
Login Page



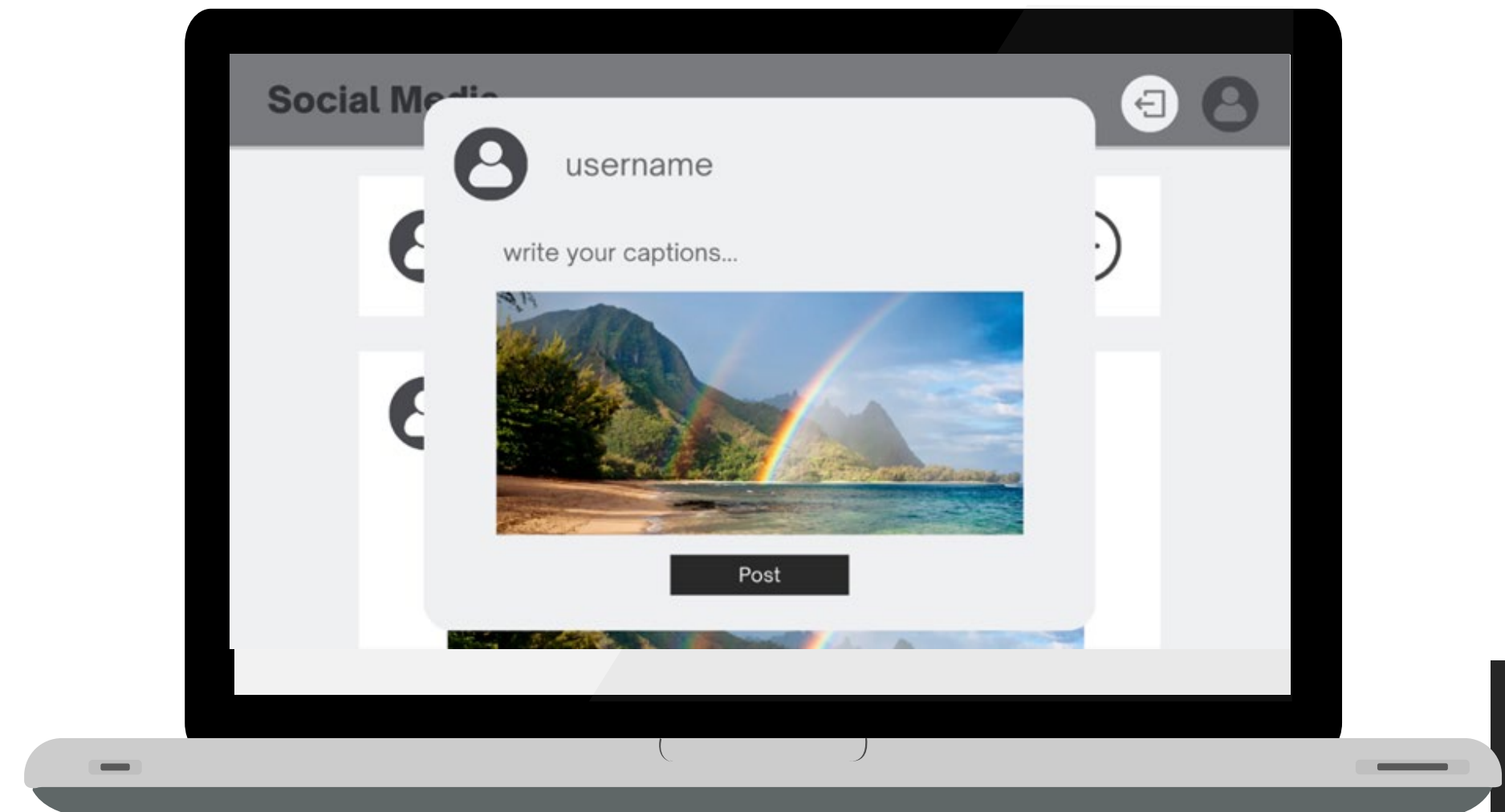
Signup Page

User Interface Design

Social Media Prototype for Testing

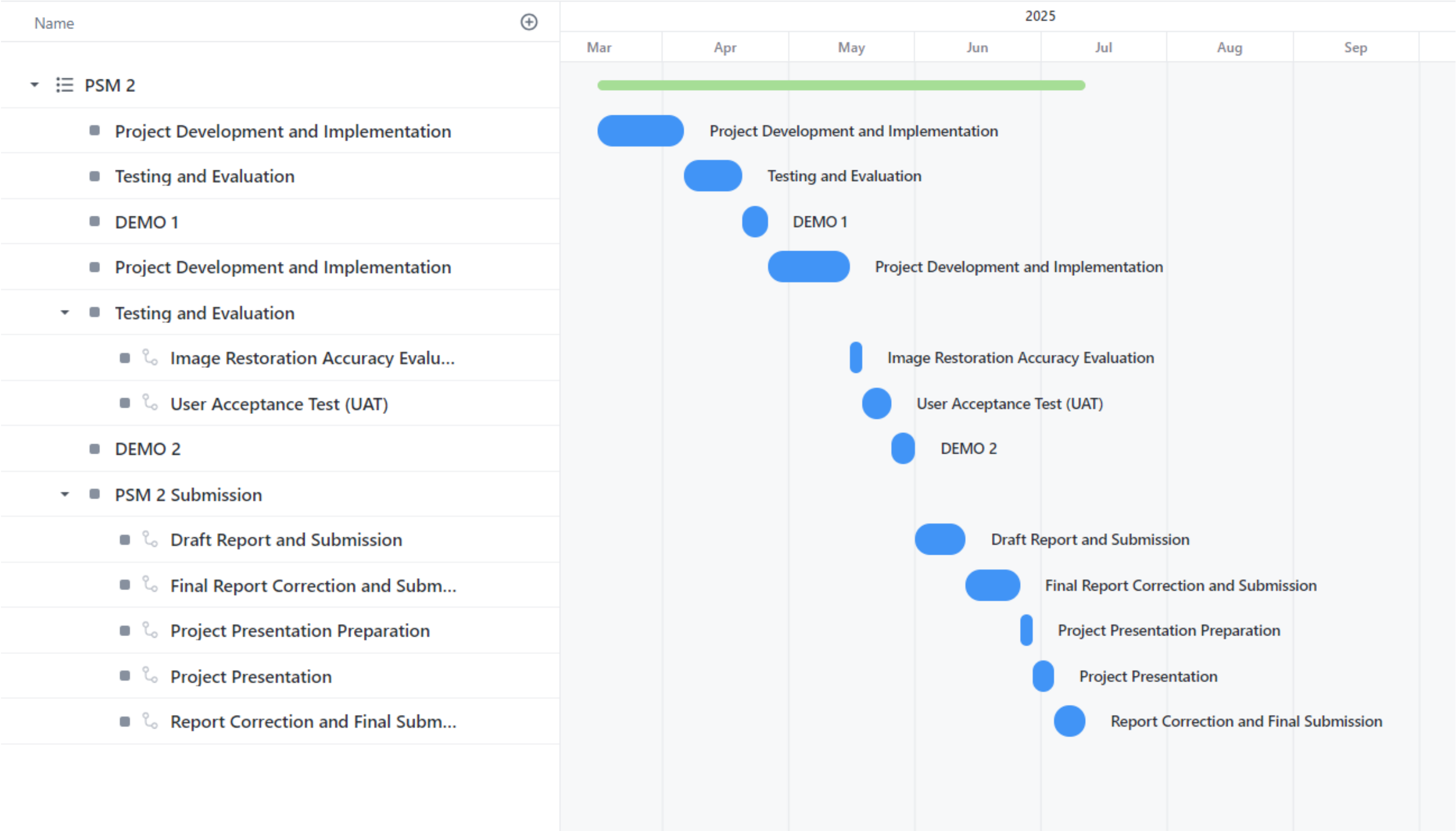


Browse Social Media Page



Post Content Page

Planning for PSM 2



Conclusion

PSM 2 will focus on system development and testing, beginning with the collection of filtered images and implementation of the Iterative First-Order Reverse Image Filtering algorithm. Following the main function's implementation, additional features such as database integration and user interface will also be developed. A social media prototype will be created for testing the system's performance and user satisfaction, ensuring the extension accurately recovers raw images and meets user expectations.

Objective 1 has been achieved, while objective 2 remains partially completed and will continue into 'Projek Sarjana Muda' 2 (PSM2). Objective 3 will also be extended into PSM2.

THANK YOU



univteknologimalaysia



utm.my

utmofficial