

Abstract

Underwater images often suffer from blurriness and color degradation (bluish-green) as depth increases. Underwater image restoration aims to produce clear and natural looking images that accurately reflect the true underwater scene.

Problem Statement

The primary goal is to develop a UWIR system capable of effectively restoring images captured underwater.

Objectives

- 1.Improved Visibility: Reduce haze and scattering effects,leading to a clearer and morevisually interpretable image.
- 2.Enhanced Color Fidelity:Correct the dominant blue/green color cast caused by light scattering and restore a more accurate and balanced color representation of the underwater environment.

Requirement Engineering

Functional Requirements

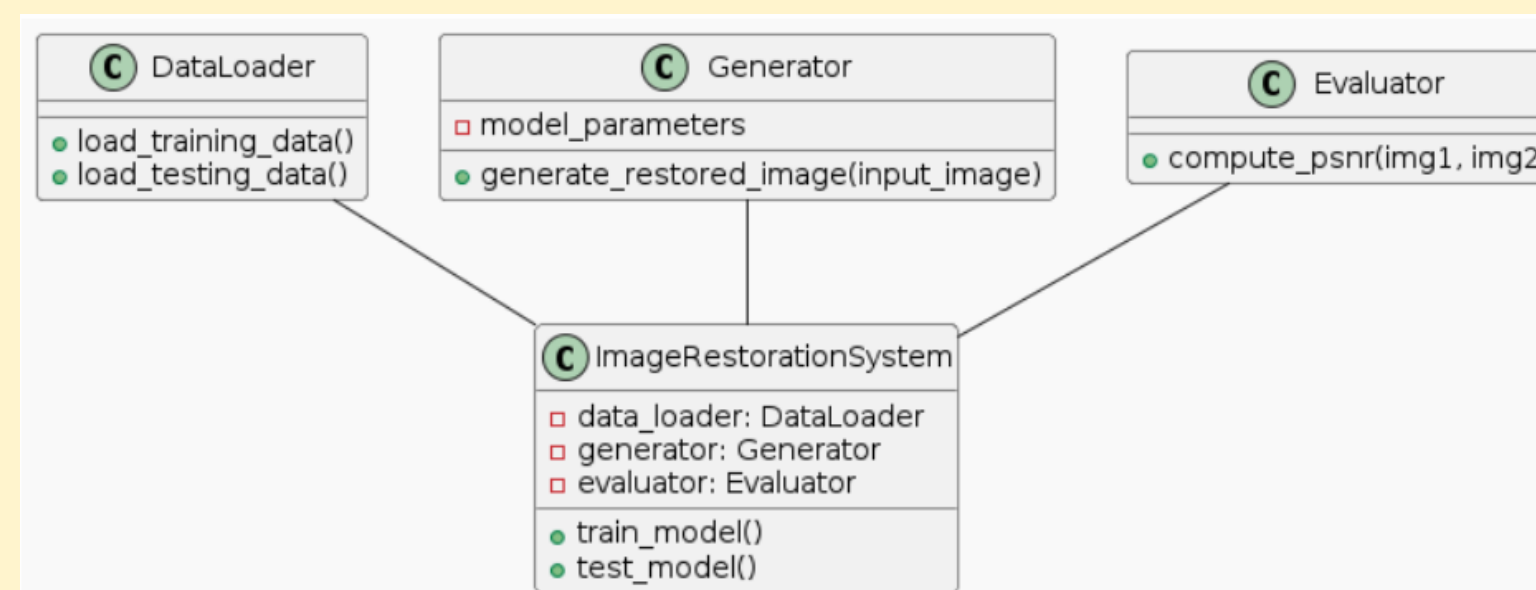
- 1.Image Enhancement
- 2.Enhanced Color Fidelity
- 3.Dehazing

Non-Functional Requirements

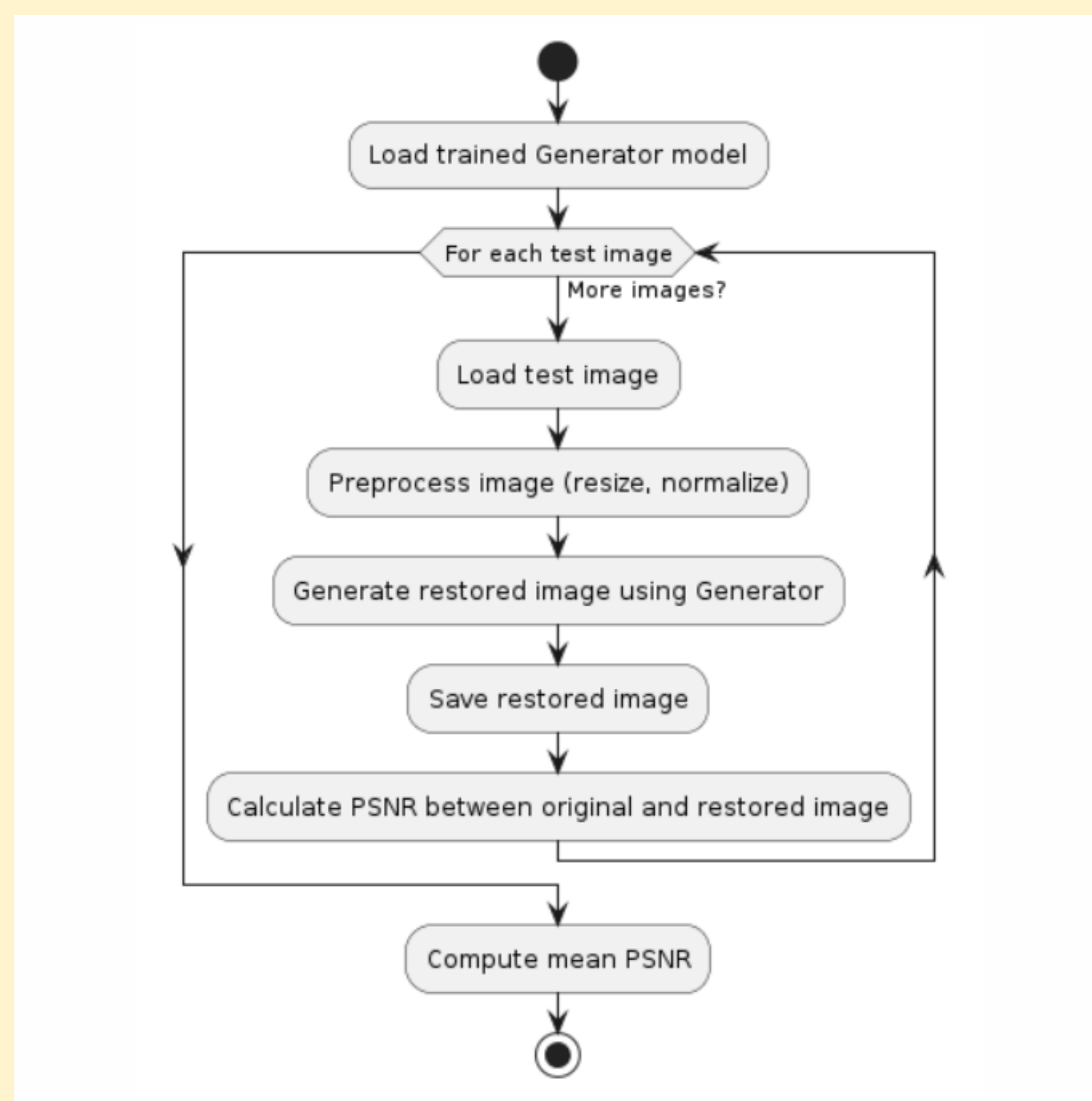
- 1.Minimal processing time.
- 2.Robust consistent performance across different scenarios.
- 3.user-friendly interface.

Design

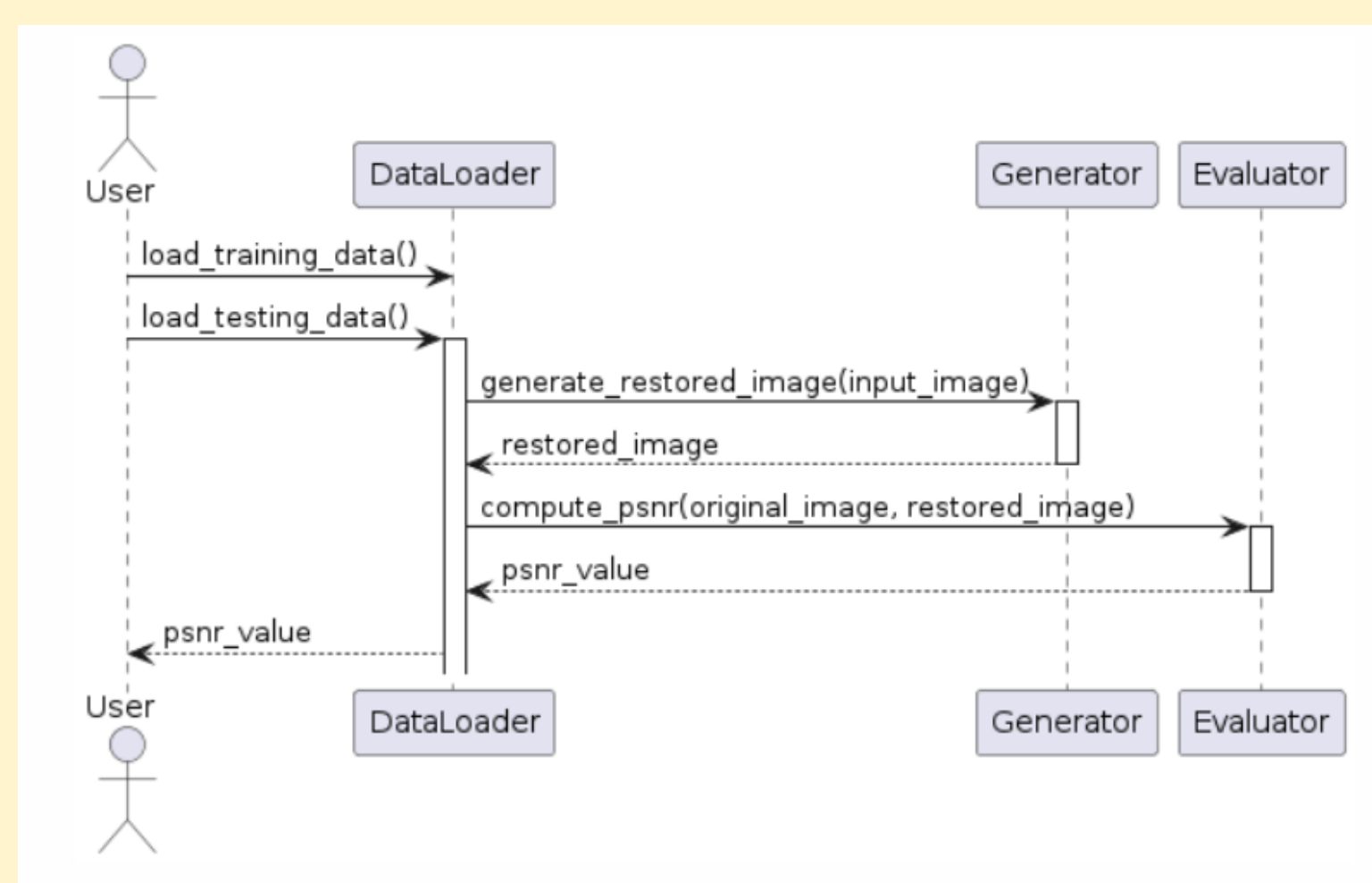
Class Diagram:



Activity Diagram:



Sequence Diagram:



Implementation and testing

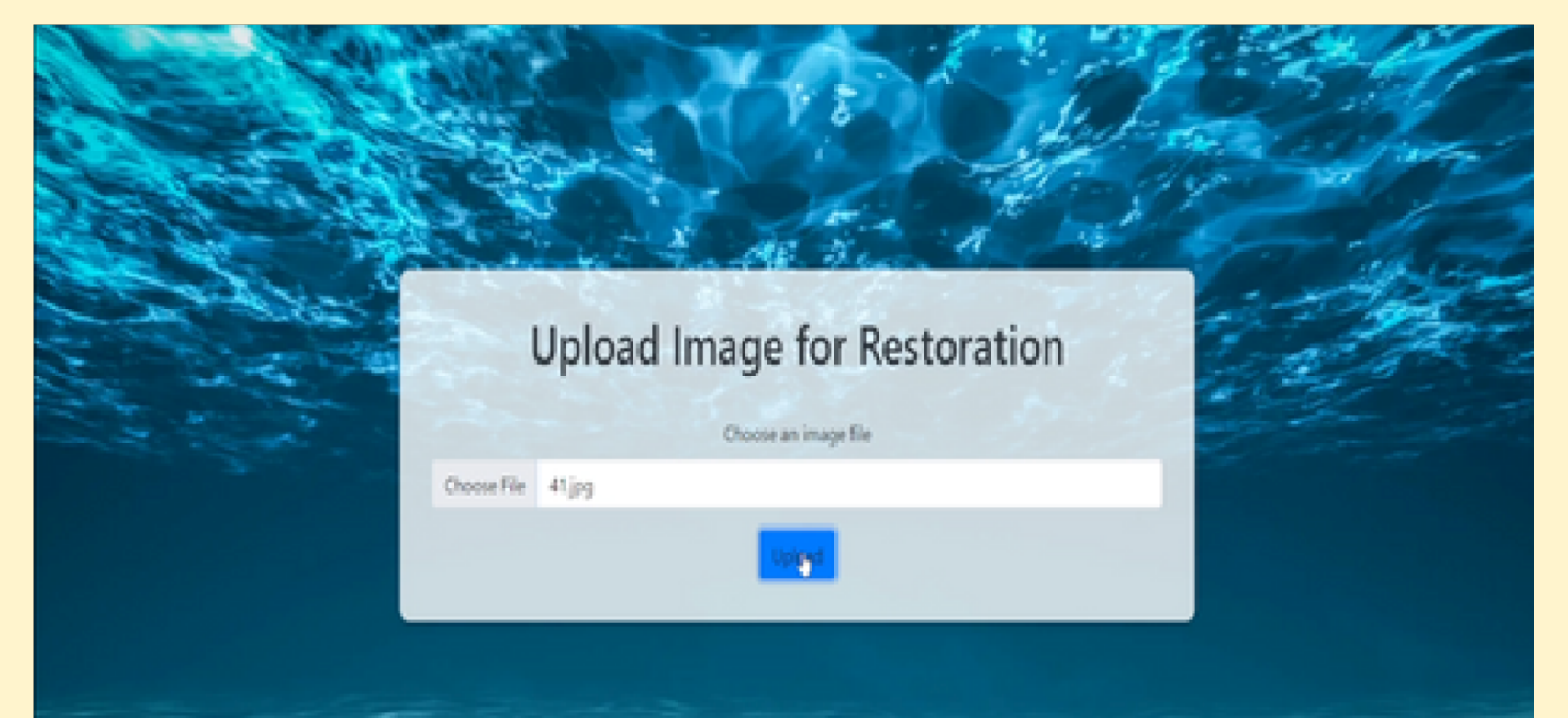
Platform : jupyter notebook, flask.

Parameters: PSNR, SSIM

Testing

ID	Description	Expected Result	Actual Result	Result
TC001	Upload a valid image file and check restoration	Image is uploaded successfully, and restored image is displayed with correct PSNR, SSIM values.	Image uploaded successfully, restored image displayed, and metrics calculated correctly.	Pass
TC002	Upload an invalid file type (e.g., .txt)	Error message indicating invalid file type.	Error message displayed indicating invalid file type.	Pass
TC003	Upload a very large image file	Image is uploaded and processed within reasonable time.	Image uploaded and but not processed within reasonable time.	False
TC004	Upload image with no file selected	Error message indicating no file selected.	Error message displayed indicating no file selected.	Pass
TC005	Refresh page after uploading an image	Page is refreshed and user can upload a new image.	Page refreshed successfully, and user can upload a new image.	Pass
TC006	Upload image when server is down	Error message indicating server is unavailable.	Error message displayed indicating server is unavailable.	Pass

Results and discussions



References

1. Yecai Guo, "Underwater Image Enhancement Using a Multiscale Dense Generative Adversarial Network", 2020.