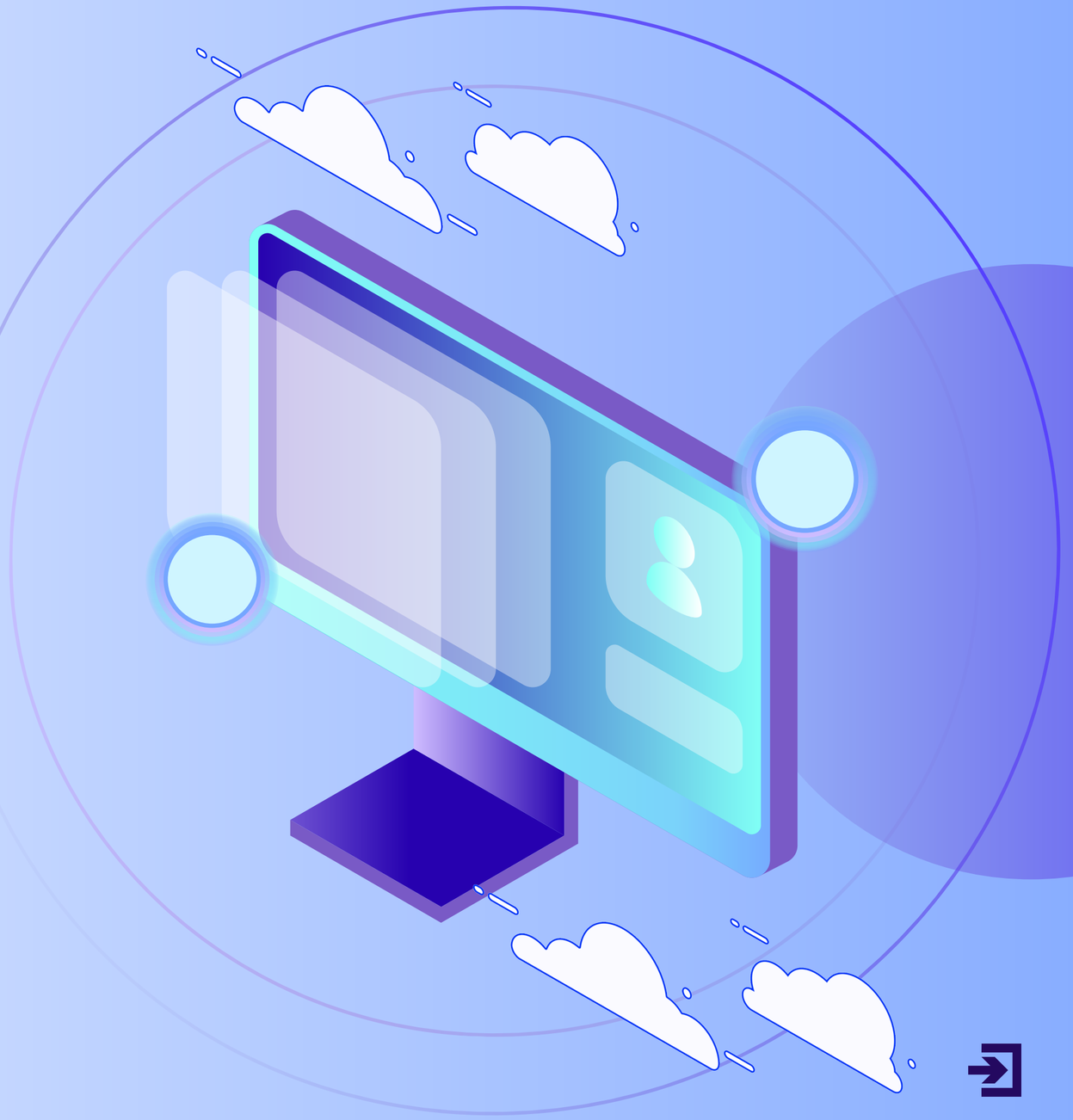
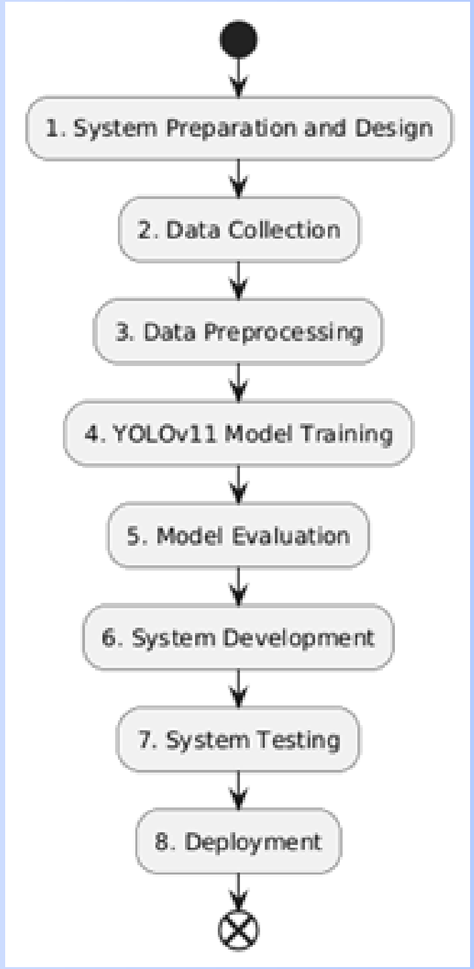
SKIN DISEASE IDENTIFICATION

https://skindisease-detect.streamlit.app/



PROJECT IMPLEMENTATION METHOD



PROJECT IMPLEMENTATION METHOD

1. System Preparation and Design

In the system preparation and design stage, this research begins with an in-depth literature study on the YOLO algorithm, specifically its latest version, YOLOv11. This stage is crucial for understanding the basic concepts, advantages, and limitations of the YOLO algorithm in object detection, as well as identifying factors that affect detection accuracy and speed. In the context of skin disease detection, the research team will review previous studies related to the application of YOLO in the medical field, particularly for image-based disease detection. Through this literature review, the team will also study the common characteristics of relevant skin disease datasets, including the classification of types of skin diseases typically found in visual diagnoses. After the literature review, system design is carried out by constructing the detection system architecture, including components such as data processing modules, the YOLOv11 model architecture, and the system performance evaluation mechanisms.

2. Data Collection

The skin disease data collected is obtained from publicly available datasets of images of human skin affected by skin diseases, where the stored images will be used to train and test the YOLO model. Data collection is crucial to ensure that the model can detect and identify diseases accurately. The goal of this stage is to gather representative data, which will be used in the training and testing process to enhance the accuracy and effectiveness of the detection and classification of skin diseases in the system.

PROJECT IMPLEMENTATION METHOD

3. Data Preprocessing
In this stage, data cleaning is performed to ensure the quality of the dataset used. This includes filtering out images that are blurry, have very low resolution, or contain excessive noise, as these can negatively affect the model's performance in accurately detecting skin diseases. Next, data labeling is done by tagging each image with the corresponding skin disease type. This labeling process is vital as it serves as the foundation for the model to understand and classify image patterns into specific disease categories. Labeling is done manually or with the assistance of annotation tools to ensure the labels are accurate and consistent.

4. YOLOv11 Model Training
The YOLOv11 model is trained using the processed data to recognize and classify skin diseases with high accuracy. This training process involves adjusting the parameters so that the model can better recognize and detect diseases with a high degree of precision. The goal of this stage is to create an effective skin disease detection model that works optimally.

5. Model Evaluation
Using test data, the trained model is evaluated to assess its performance in detecting and classifying diseases. This is done by using metrics such as accuracy, precision, recall, and F1 score, which indicate how well the model processes images and produces accurate results. These metrics provide a comprehensive overview of the model's performance, both in terms of detection accuracy and its ability to identify skin diseases correctly.

PROJECT IMPLEMENTATION METHOD

6. System Development

In the system development stage, the previously trained YOLOv11 model is implemented to detect various types of skin diseases. The YOLOv11 model used has gone through the training process with the skin image dataset, allowing it to recognize characteristic patterns in various categories of skin diseases. This implementation begins by integrating the model into the detection system, which is based on a web application or platform that has been designed. The model is connected to an image input module, allowing users to upload or capture skin images directly, and an output module, which displays the detection results, including the identification of the skin disease and the model's confidence level.

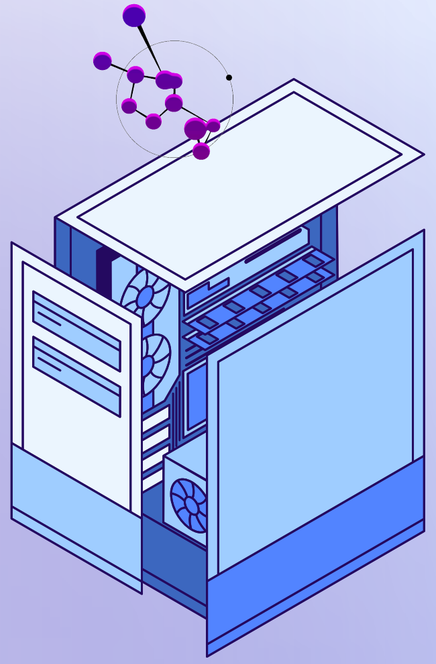
7. System Testing

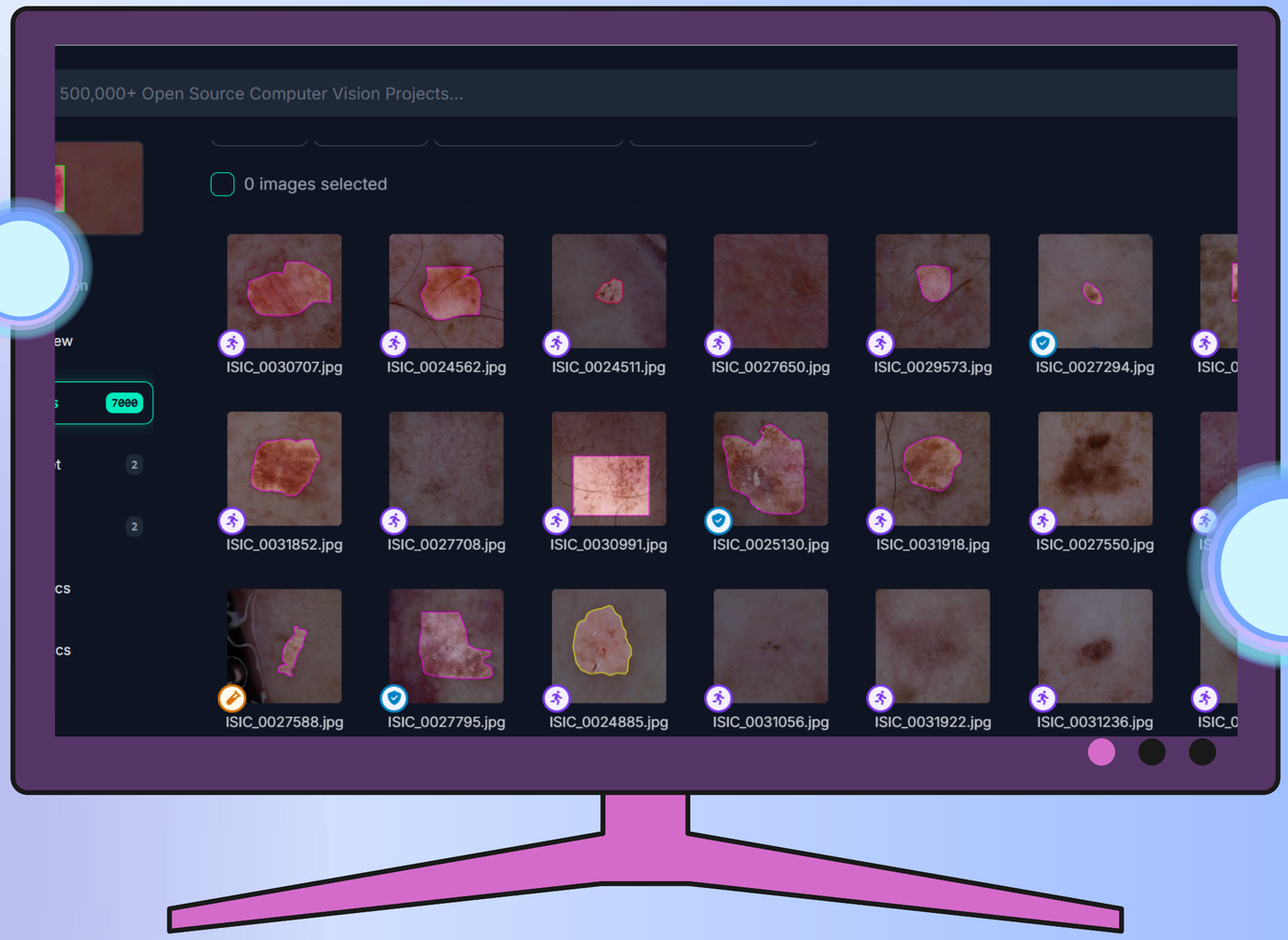
The developed system is tested using a test dataset containing skin disease images that the model has not seen before. This testing aims to evaluate the model’s performance in terms of accuracy, precision, detection speed, and error rates in identification. The results of this testing will be analyzed to identify areas for improvement, such as adjusting the model parameters or expanding the dataset, in order to enhance the reliability and accuracy of the skin disease identification system.

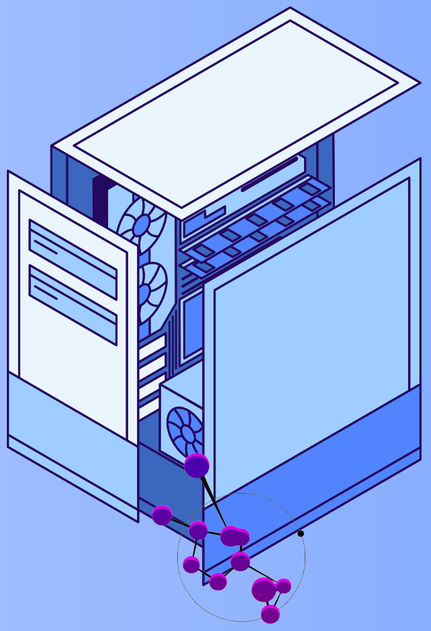
8. Deployment

The YOLOv11-based skin disease detection system is implemented using the Streamlit platform, which enables accessibility and ease of user interaction. With Streamlit, the system can be presented through a simple yet interactive web interface, allowing users, such as healthcare professionals or patients, to directly upload skin images for detection by the model. The deployment process begins by integrating the trained YOLOv11 model into the Streamlit application, including model configuration for image processing and real-time prediction. The interface components are developed so that users can view the detection results, including disease classification labels and the confidence level generated by the model.

DATA COLLECT







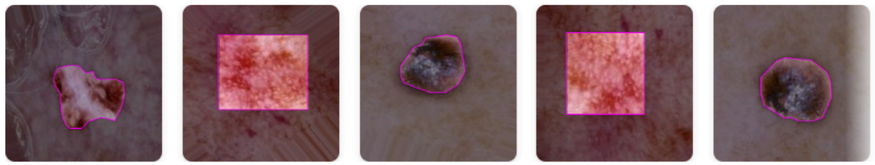
https://universe.roboflow.com/universitas-dian-nuswantoro-u3s2y/skin_diases_detection

DATASET

Dataset Details

7000 Total Images

View All Images →



Dataset Split

TRAIN SET	VALID SET	TEST SET
80%	10%	10%
5600 Images	700 Images	700 Images

Preprocessing

Auto-Orient: Applied

Resize: Stretch to 640x640

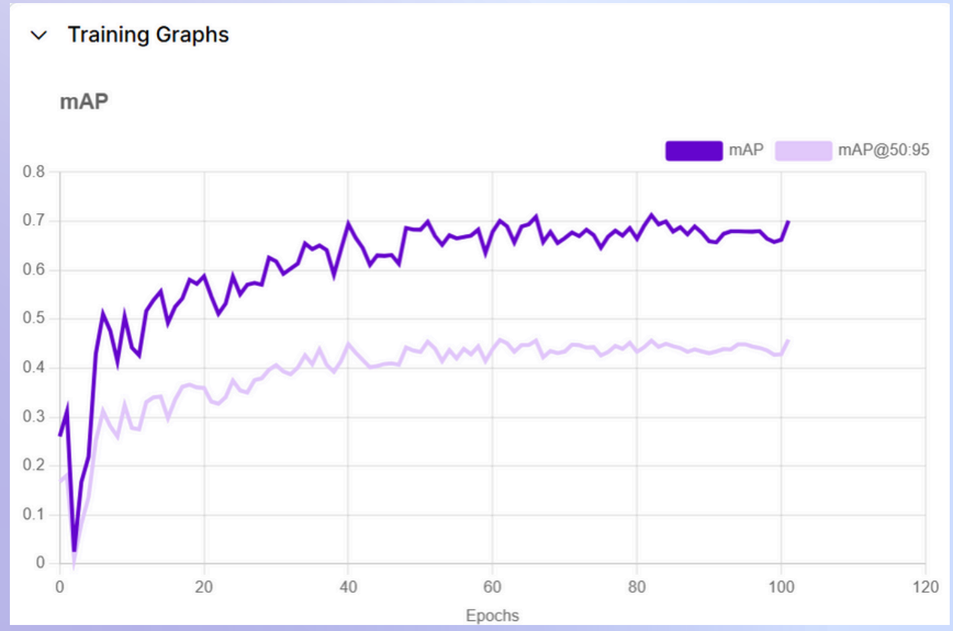
Augmentations

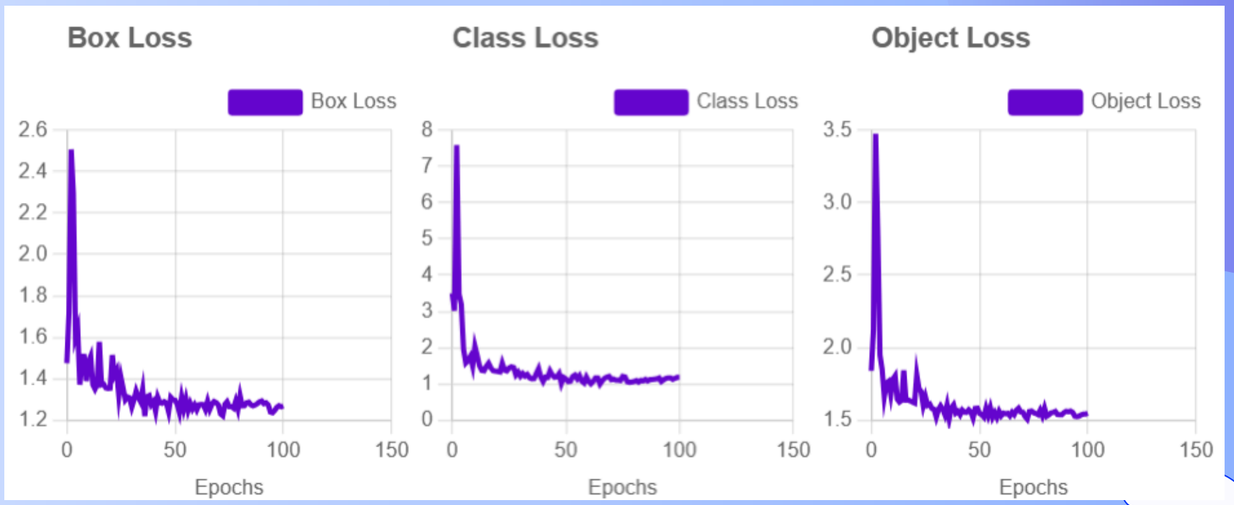
No augmentations were applied.

COLOR	CLASS NAME	COUNT
	BCC (Basal Cell Carcinoma)	1,000
	BKL (Benign Keratosis)	1,000
	DF (Dermatofibroma)	1,000
	MEL (Melanoma)	1,000
	NV (Nevus)	1,000
	VASC (Vascular Lesion)	1,000
	akeic (Actinic Keratosis)	1,000

TRAIN MODEL

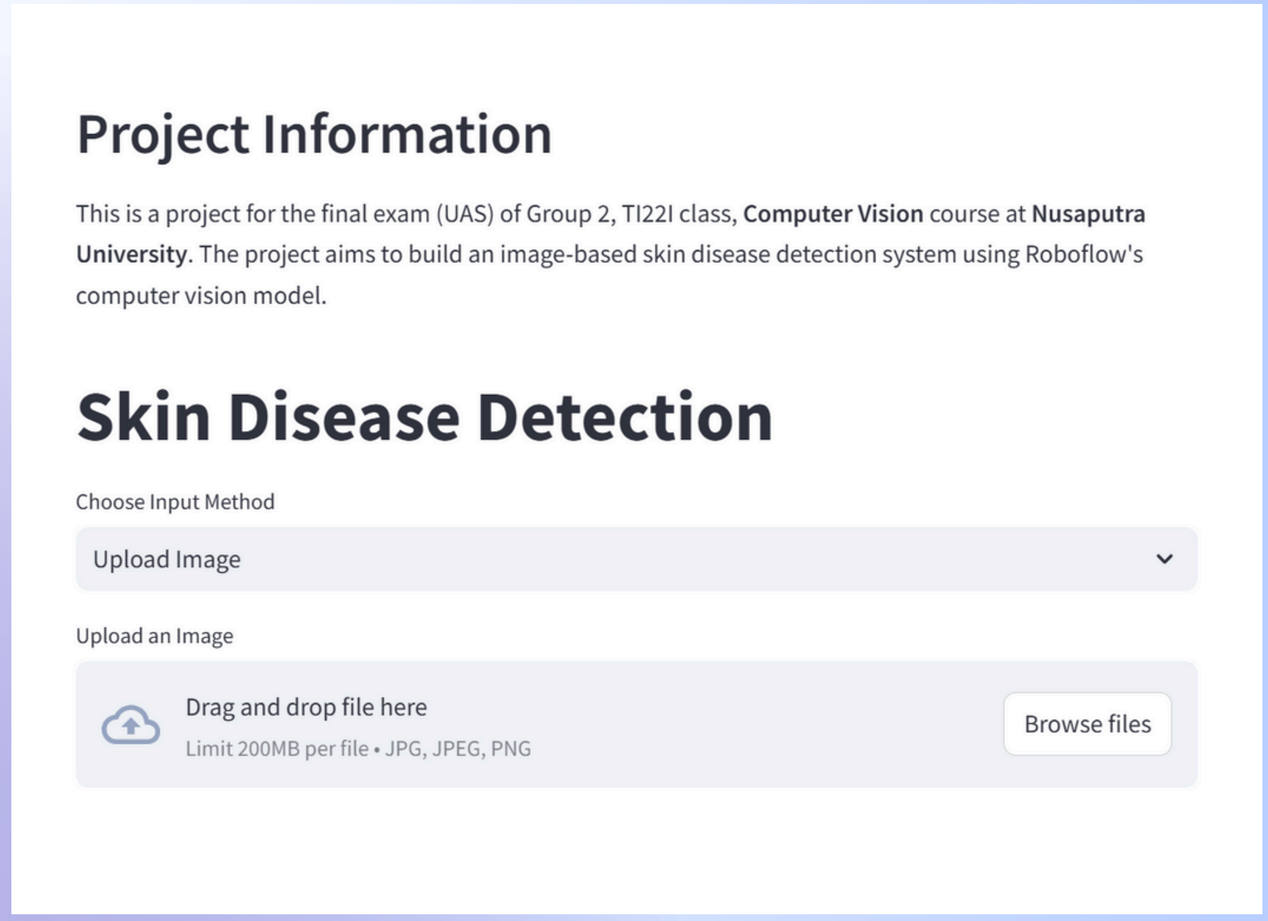
MODEL NAME	UPDATED	METRICS		TYPE
Skin_Disease 1 ID: skin_disease-y20fz/1	12/23/24, 11:37 PM	mAP Precision Recall	70.1% 69.5% 66.6%	YOLOv11





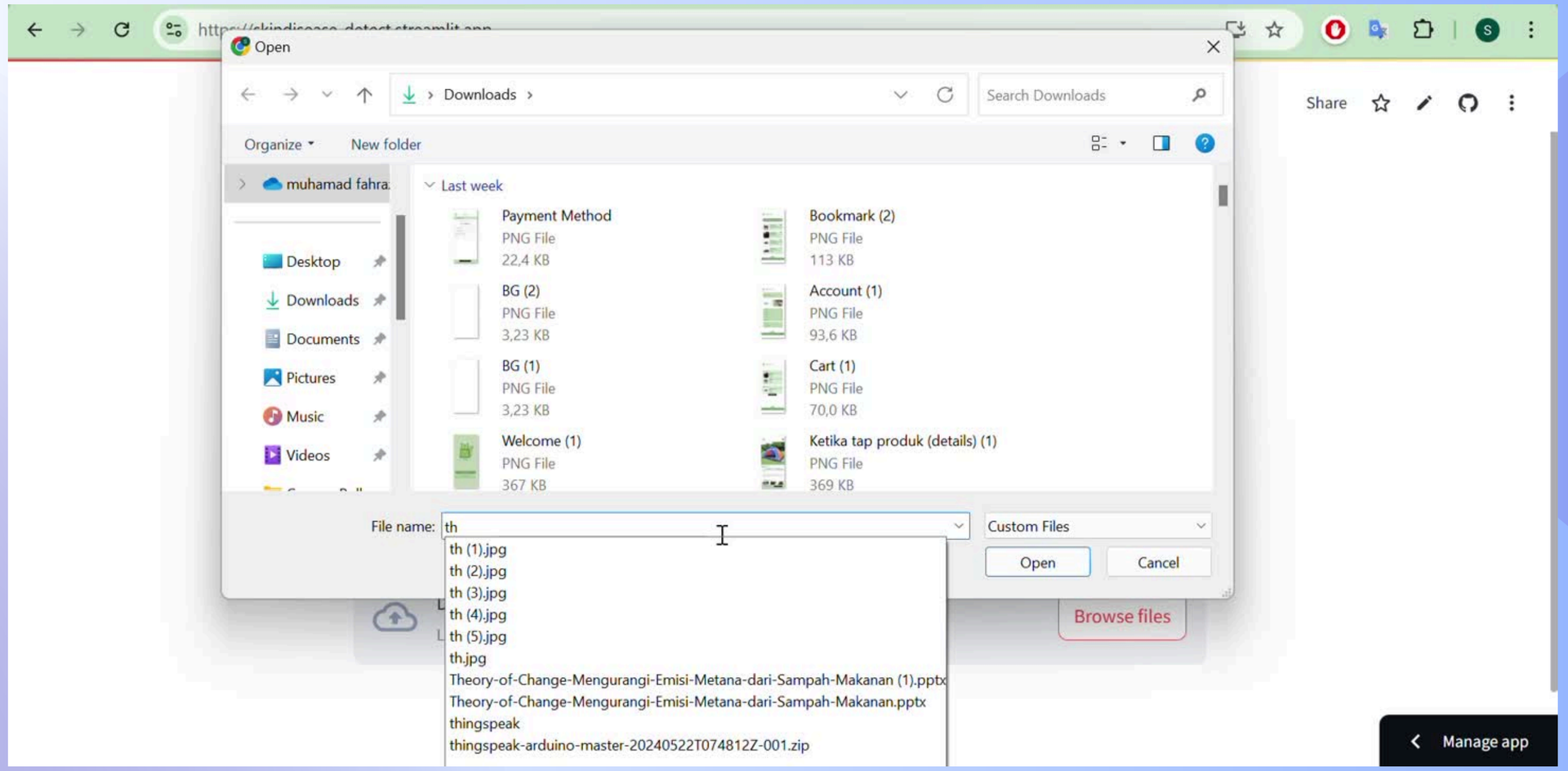
DEPLOYMENT

https://skindisease-detect.streamlit.app/



link Github :
https://github.com/muhamadazz/SkinDisease-Detect

DEMO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Videos
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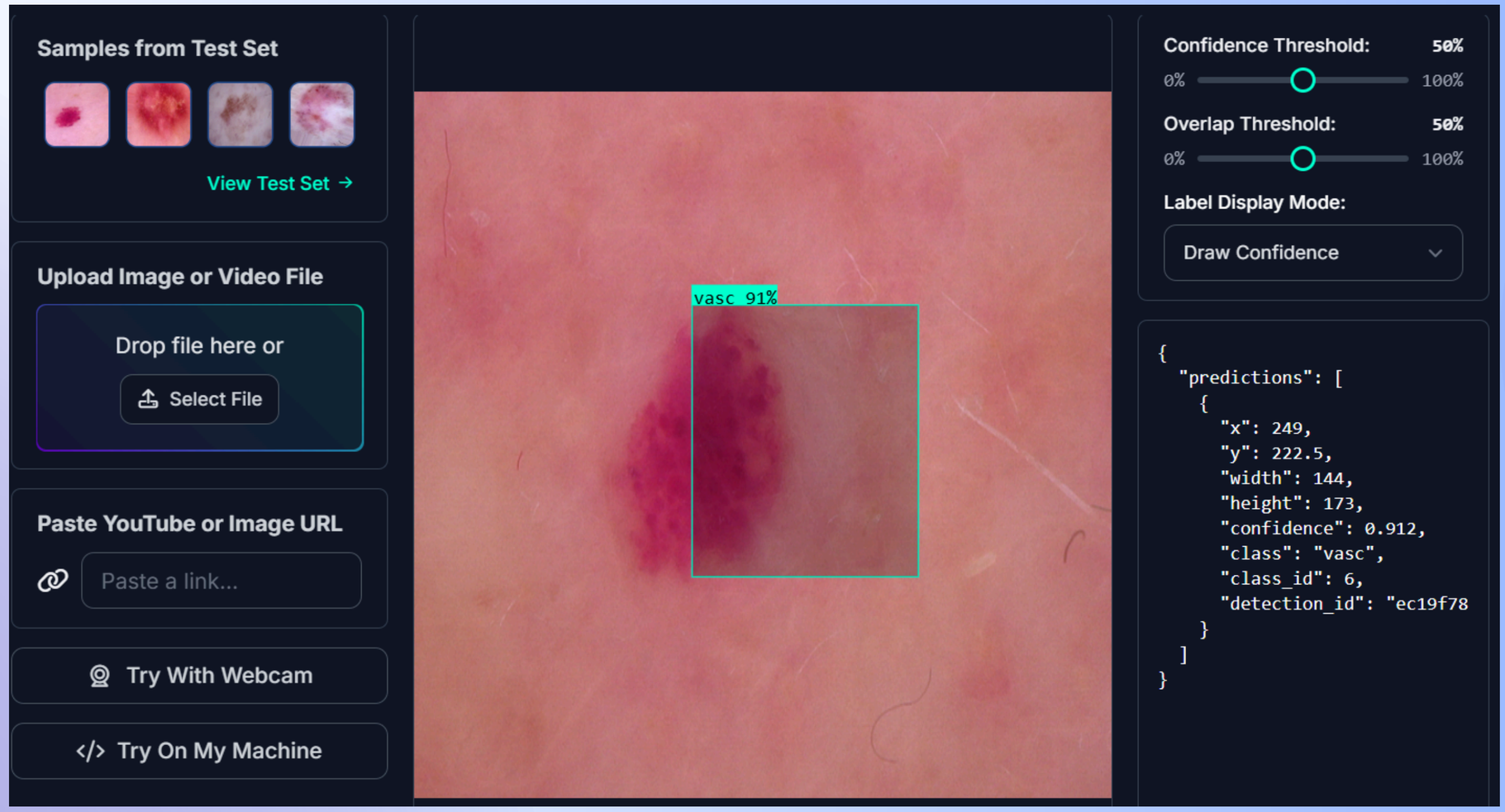
Browse files
Manage app

DEPLOYMENT

https://universe.roboflow.com/uascv-5uxrj/skin_disease-y20fz/model/1



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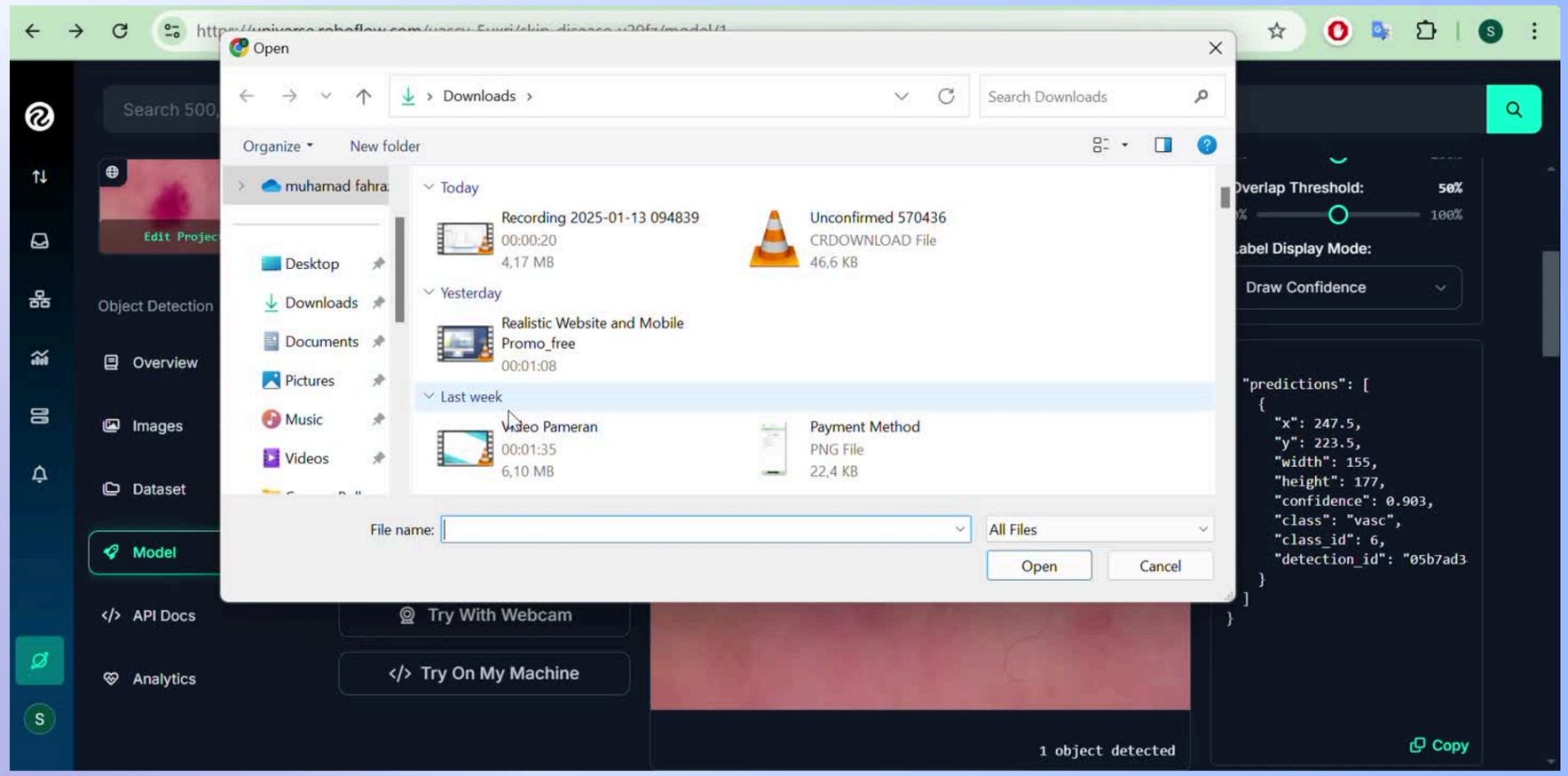

THANK YOU!