

# Safety gear detection system

Infosys Internship 5.0

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# Agenda

 Topics Covered



1 Introduction

2 Project Scope

3 Requirements

4 Technical Stack

5 Development & User Guide

6 Conclusion & References

7 Future Scope

# Introduction

- Importance of workplace safety in industrial and construction environments.
- Challenges in ensuring adherence to safety protocols
- Automated real-time detection of missing safety gear.
- Utilizes YOLOv8 for detecting helmets, masks, safety vests, etc.
- Streamlit-based interface for image and video processing.
- Automated email alerts



# Project Scope



## Features Included:

- Interactive Interface
- Safety Gear Detection
- Alert Mechanism

## Challenges and Constraints:

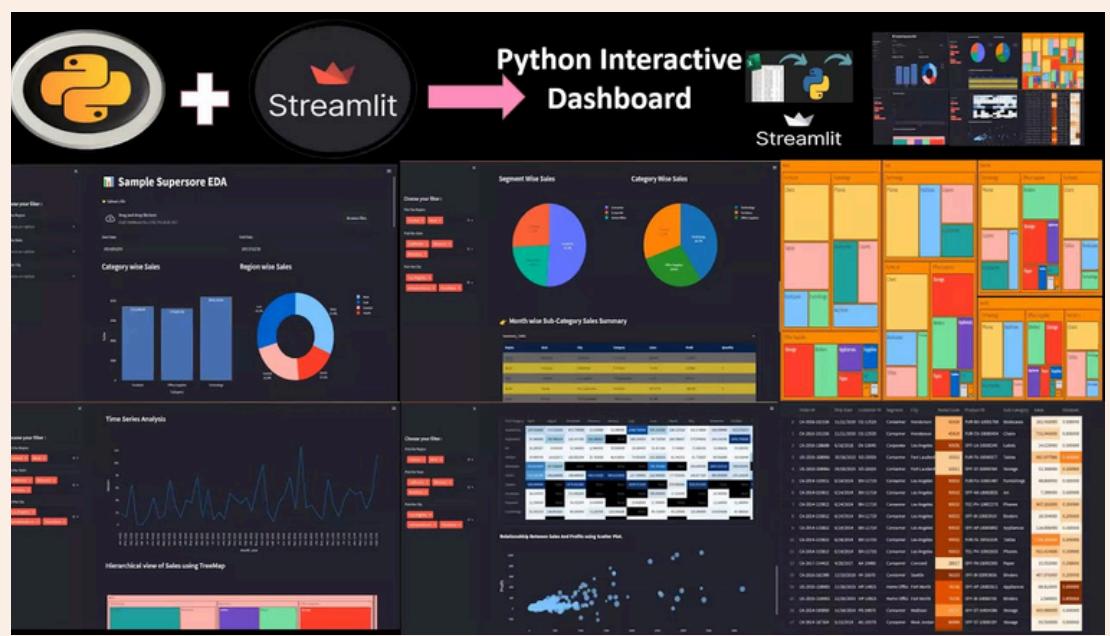
- System Requirements
- Manual Setup
- Detection Accuracy
- Scalability Limitations
- Deployment

# Requirements



Safety gears types

Categorisation of different safety gears and processing of input files



Streamlit webpage

Interactive display for users



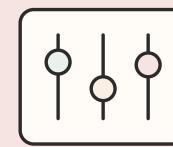
Email alerts

employee gets the alerts.

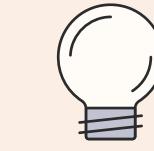
# Technical Stack



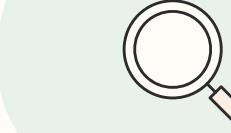
Programming  
Language: Python



Libraries: YOLOv8, Streamlit,  
OpenCV, Matplotlib,  
Seaborn, Pandas, SMTP



Platform: Google  
Colab, VS Code, and  
Streamlit Web App



External Services:  
Gmail

# Challenges and Solutions

- Dynamic Inputs in YOLO & Streamlit:
  - Challenge: Difficulty in managing various input types (images/videos).
  - Solution: Developed modular functions for efficient processing. Used consistent color schemes and clear annotations.
- Secure Email Notifications:
  - Challenge: Safeguarding email authentication credentials.
  - Solution: Implemented app passwords for better security.
- Video Output Accessibility:
  - Challenge: Real-time processed video display was impractical.
  - Solution: Enabled a downloadable processed video option.



# Streamlit Webpage

Deploy :

# ⚠ Safety Gear Detection System

Identify individuals missing safety gear in uploaded images or videos.

Choose input type:

- Image
- Video

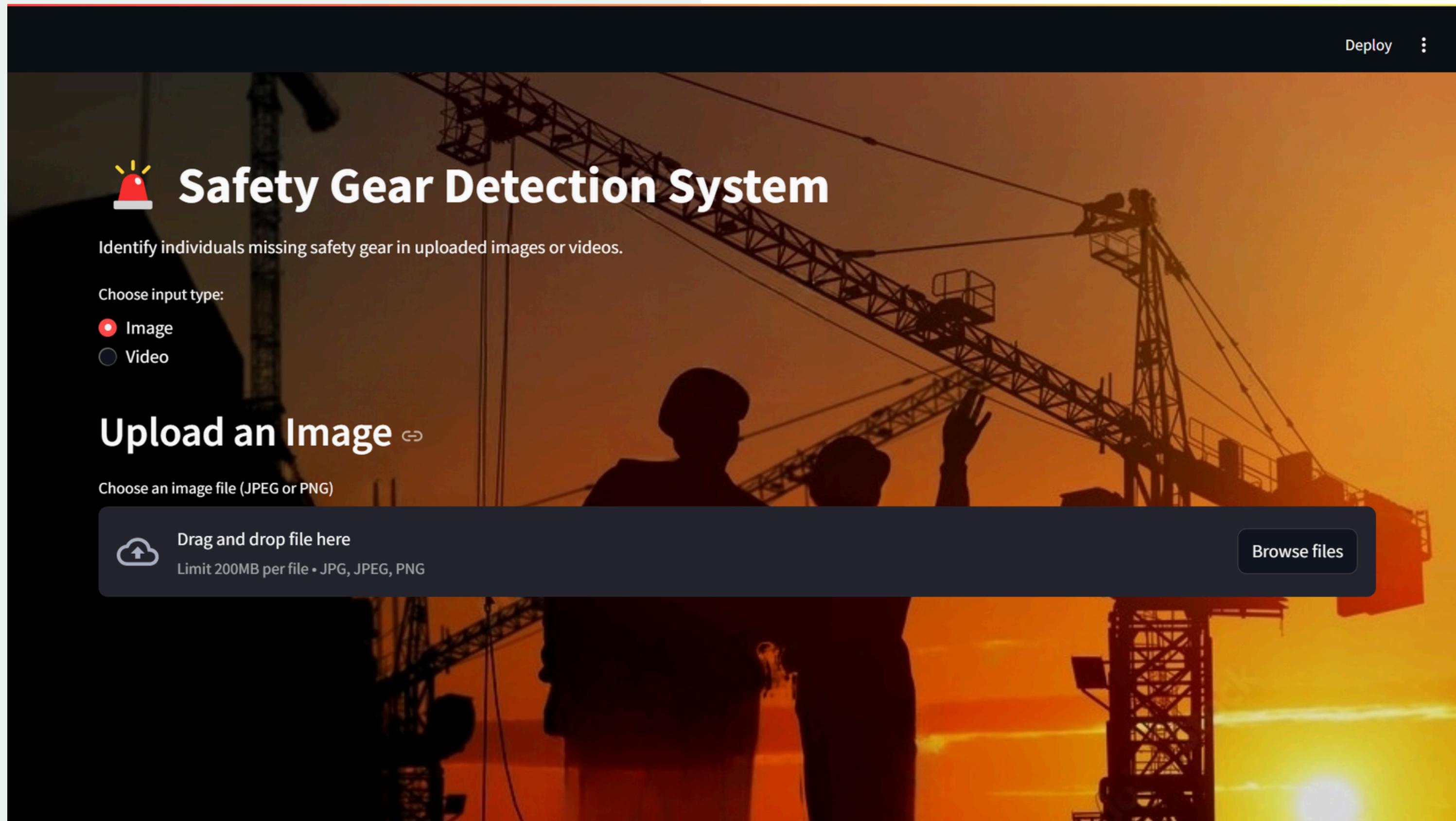
## Upload an Image

Choose an image file (JPEG or PNG)

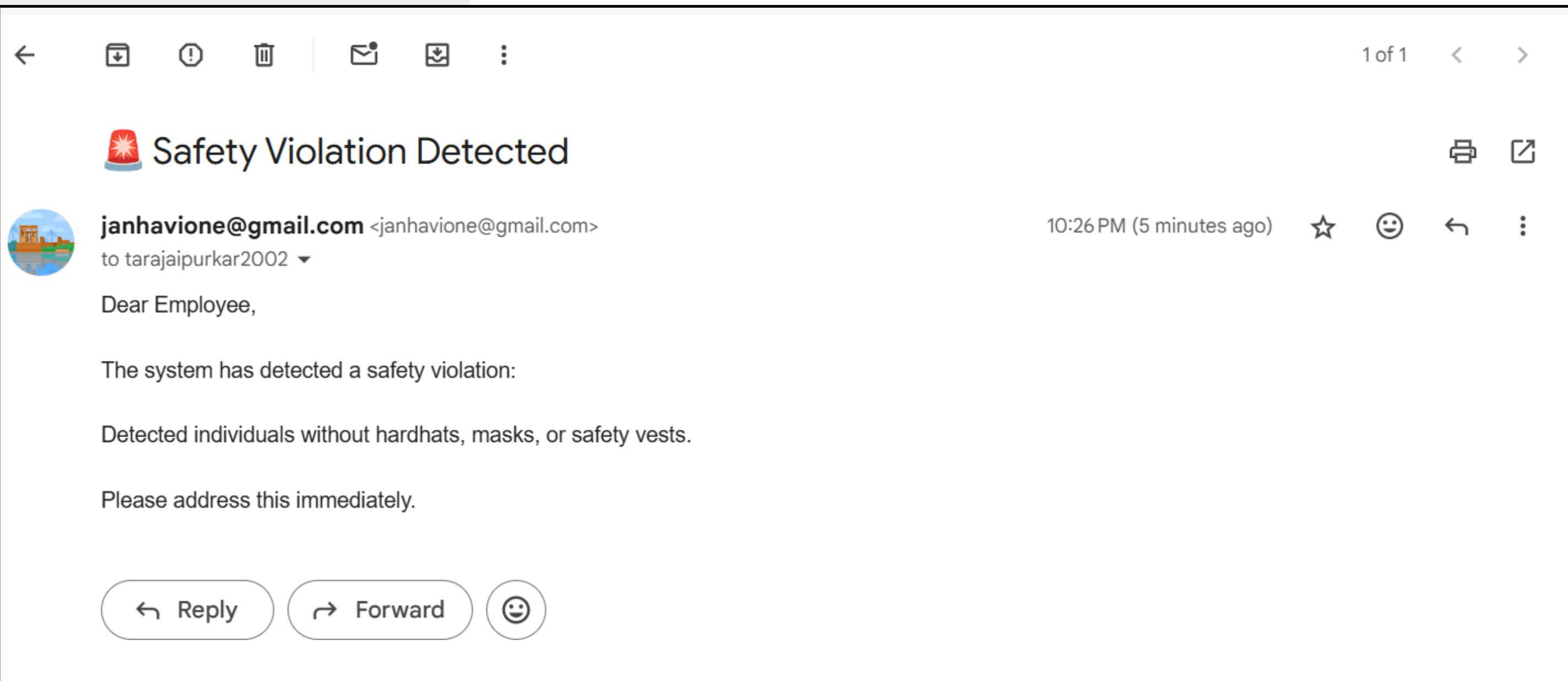
 Drag and drop file here

Limit 200MB per file • JPG, JPEG, PNG

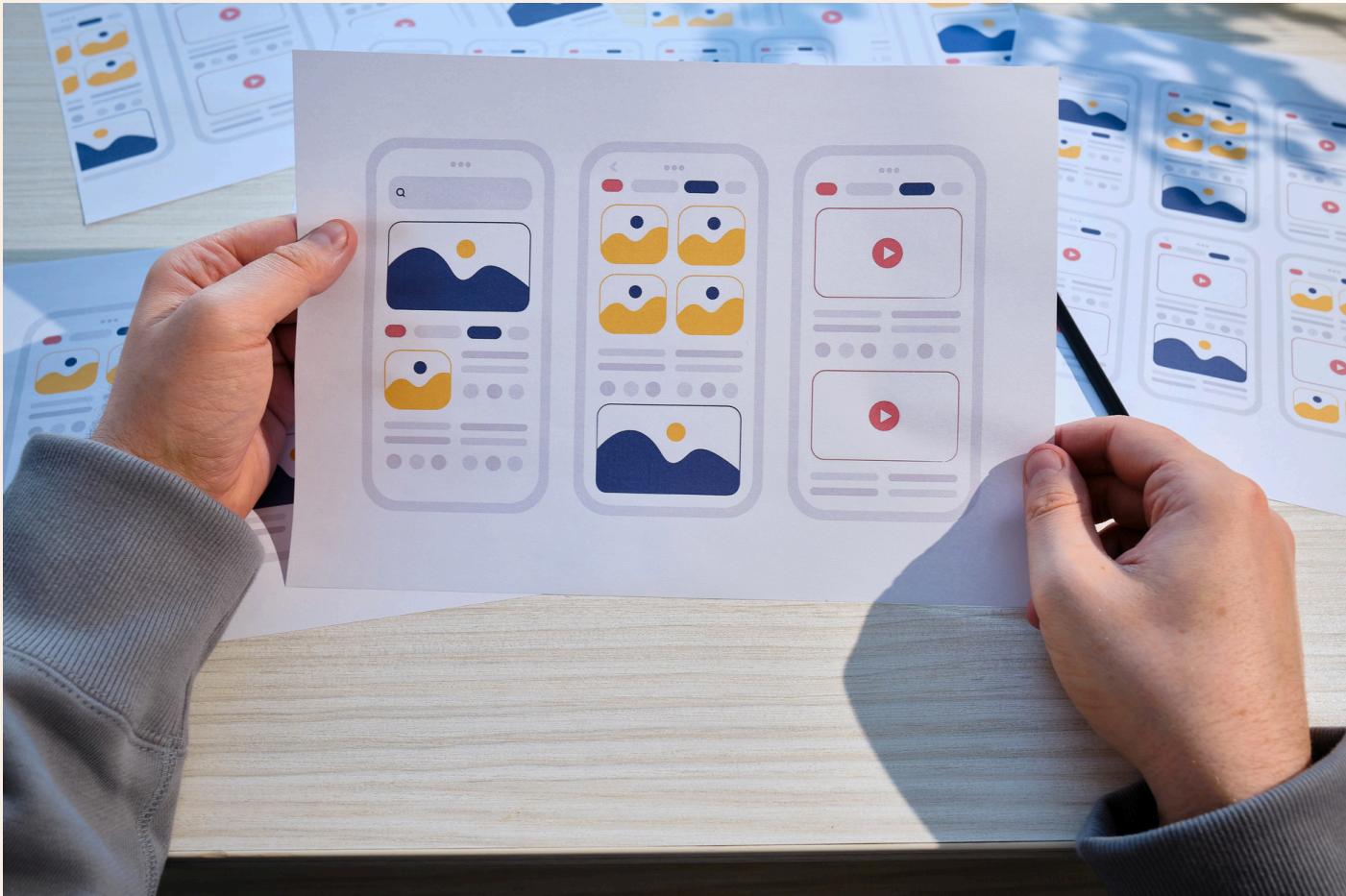
[Browse files](#)



# Email alerts



# User Guide



## Setup:

- Install dependencies.
- Add YOLOv8 weights.
- Run with Streamlit.
- Configure email app password.

## Usage:

- Upload images/videos.
- View/download results.
- Enable email alerts.

# Future Enhancements

- Live video detection
- Role-based access control
- Expanded safety detection
- Cloud deployment scalability
- Database history tracking
- Missing specific gear identification



# Conclusion:

- Implemented safety gear detection with YOLOv8 and Streamlit.
- Detects and highlights missing safety gear in images and videos.
- Provides email alerts for non-compliance.

# References:

- streamlit documentation
- kaggle dataset (user: harinuuu)
- github tutorial
- yolov8 documentation

# Thank you!

Open for Questions and Discussion!