VEHICLE CUT-IN DETECTION

TEAM: THE HAWKS

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ABSTRACT

The project on vehicle cut-in detection uses YOLOv5 to detect real-time vehicle cut-in points and collision warnings through live feed from a webcam. The frames are processed by the YOLOv5 model trained using IDD dataset provided by the Intel Unnati team.

OUR IDEA –'THE HAWKS'

- **Our aim is to detect accurately for any vehicle cut-ins along with type of vehicle within the video stream using YOLOv5 model**
- **giving out timely alerts that are based on Time-to-Collision (TTC) values that have been predefined by us**
- **Also we have added a sound alert to alert the driver immediately to avoid accidents**
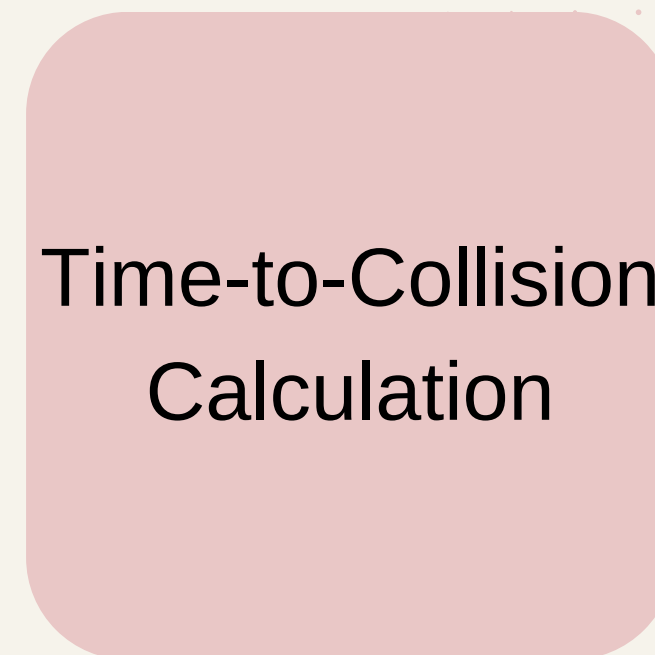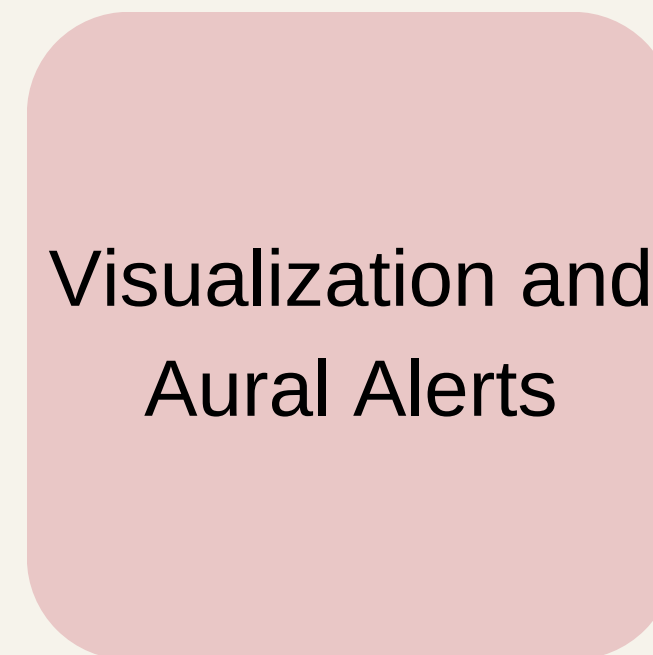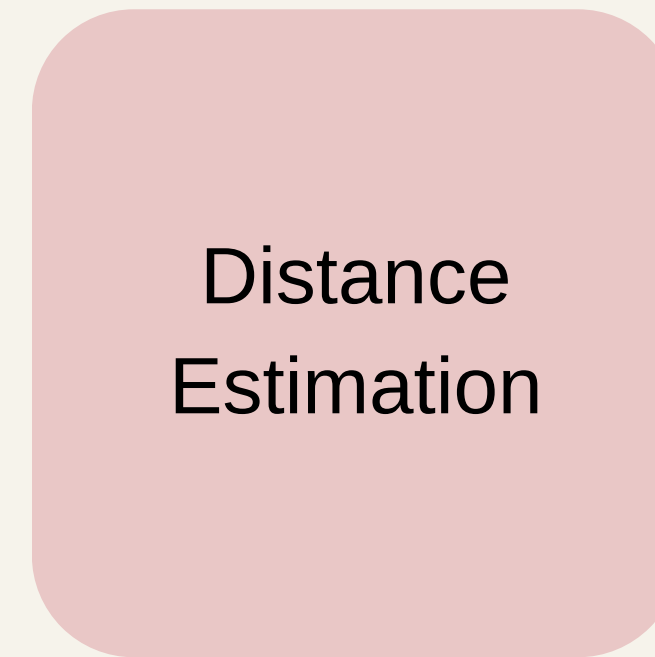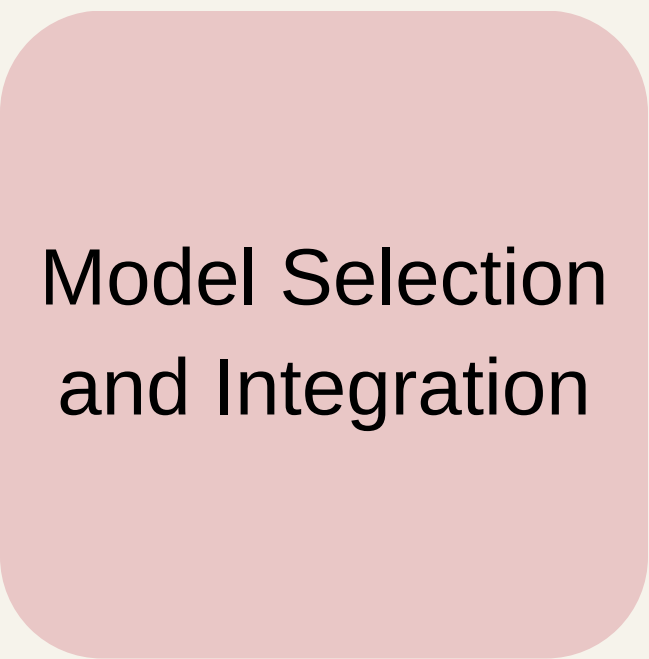
FEATURES

1. All type of road transports are detected
2. Any type of camera can be integrated as it is more accurate with minimalistic camer
3. Provides a sound alert whenever Time To Collision is 0.6seconds
4. The system calculates the distance of vehicles from the camera
5. The system also provides Collision Warnings in any output screens

PROCESS FLOW

Model Selection and Integration → Video Stream Processing → Distance Estimation →

UI Development ← Visualization and Aural Alerts ← Time-to-Collision Calculation ←

TECHNOLOGIES USED

- YOLOv5 to detect real-time vehicle cut-in points
- OpenCV, streamlit, and torch libraries are employed for video processing, interface design and deep learning respectively in this implementation.
- PyTorch is used to integrate YOLOv5 model which as far as object detection tasks are concerned is known for its speed and accuracy hence enabling every frame of the video feed to be inferenced upon in real-time.

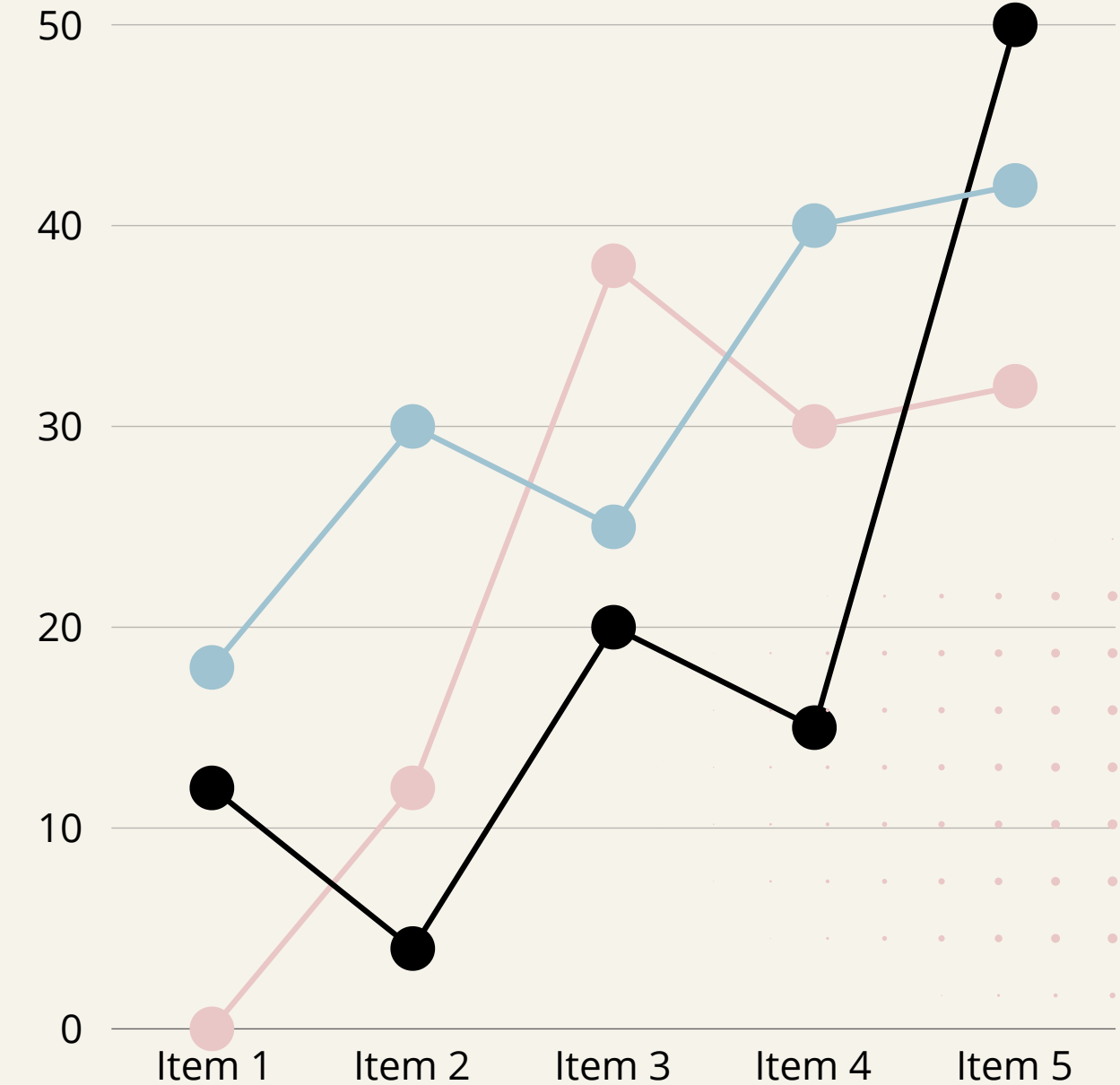# TEAM MEMBERS

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CONCLUSION

The synergy between advanced deep learning techniques and practical safety applications is therefore governmentalized in this project. This would offer not only a demonstration of technical prowess if they are to deploy the YOLOv5 real-time vehicle cut-in detection and collision warning, but highly pre-emptive measures toward safe and efficient transportation systems also. This will keep setting standards in safety technology with its continuous development and fine-tuning as it makes the way toward smarter, more responsive urban environments.

THANK YOU

Presented By : THE HAWKS