



By Team Data Divers

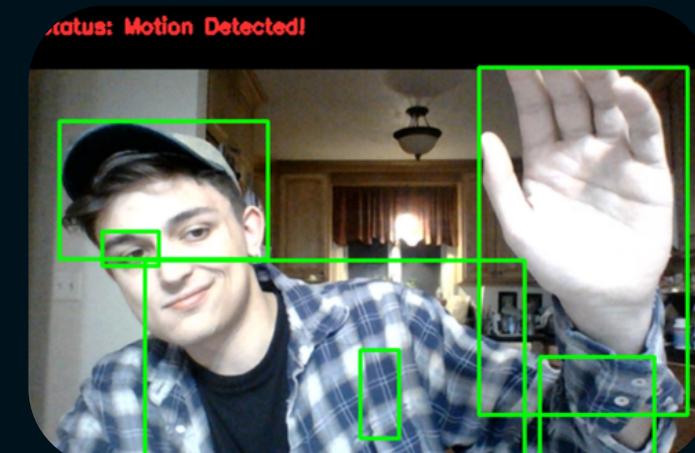
OBJECTIVES



- Develop a real-time video analysis system using multimodal AI
- Integrate emotion recognition, object detection, and motion tracking
- Provide real-time feedback through visual and audio outputs
- Ensure scalability for local and cloud deployment

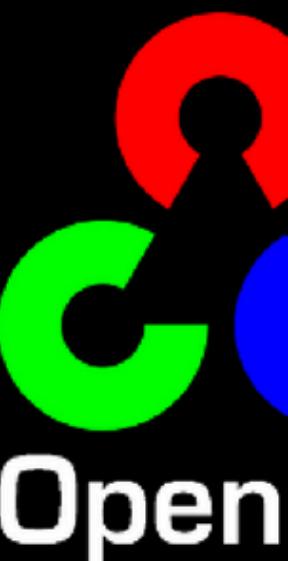
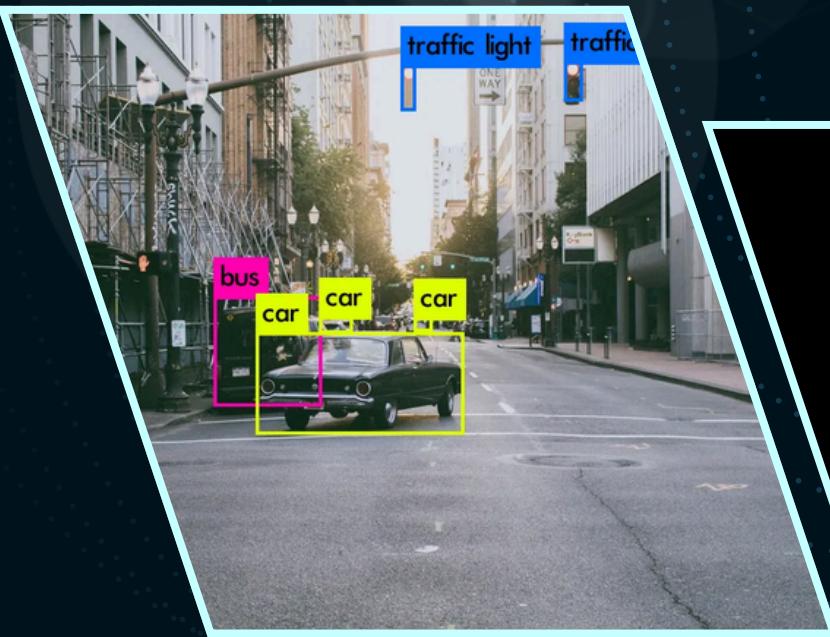
Key Features

- **Motion Detection:** Detect moving objects in real-time
- **Emotion Detection:** Identify and categorize human emotions from facial expressions
- **Sign-to-Speech:** Translate sign language into spoken language
- **Object Detection:** Recognize various objects within the video frame
- **Traffic Monitoring:** Monitor and count vehicles for traffic analysis
- **Human Count:** Track the number of people in a video frame



Technology Stack

- **Languages:** Python, HTML, CSS, JavaScript
- **Libraries:** OpenCV, YOLO, Flask, Numpy, Matplotlib, and other ML models
- **Deployment:** Local initially, with plans for cloud-based deployment
- **Integration:** Real-time video streaming with emotion, object, and motion detection, and a user-friendly interface for easy interaction and visualization of analysis results

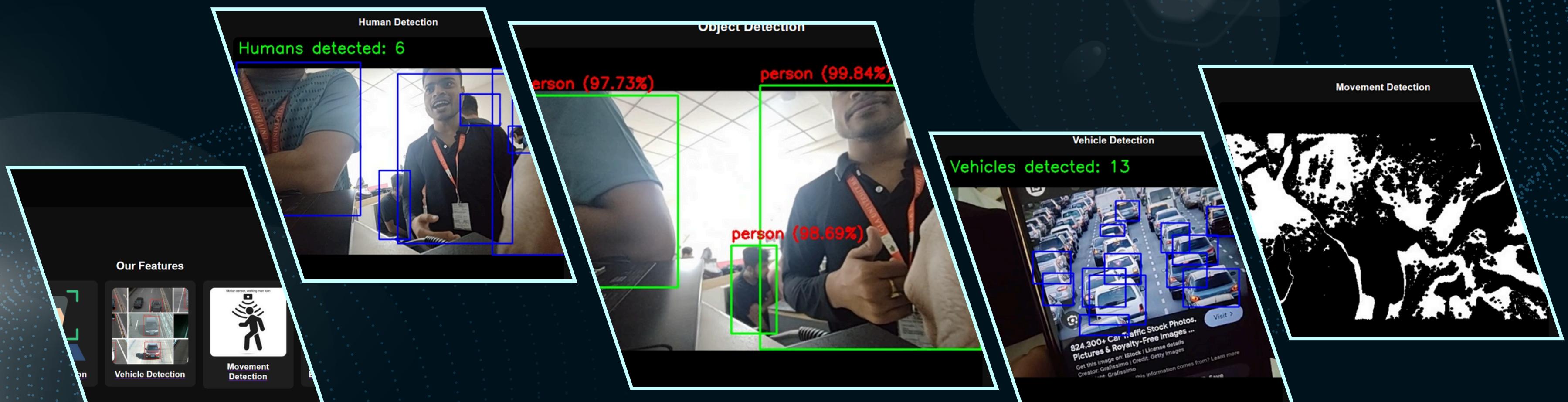


Project Architecture

- The video feed is processed in real-time
- YOLO is used for object detection and motion tracking
- OpenCV is used for emotion detection based on facial expressions
- All functionalities are integrated into a Flask-based web app for interaction
- Front-end for displaying results (emotion analysis, object count, etc.)



Implementation Flow



Key Challenges

- **Real-Time Processing:** Ensuring smooth and responsive performance while processing video feeds in real-time.
- **Accuracy of Emotion Detection:** Fine-tuning the OpenCV model for higher accuracy in diverse lighting conditions and facial expressions.
- **Model Integration:** Combining multiple AI models (YOLO, OpenCV) into a single system without performance bottlenecks.

Future Enhancements

- **Cloud Deployment:** Transition the solution to the cloud for greater scalability and accessibility
- **Additional Features:** Incorporate more advanced emotion detection, better object recognition, and more efficient traffic analysis
- **Optimizations:** Improve the accuracy of emotion detection and object tracking under various conditions



Features

Technology

Architecture

Flow

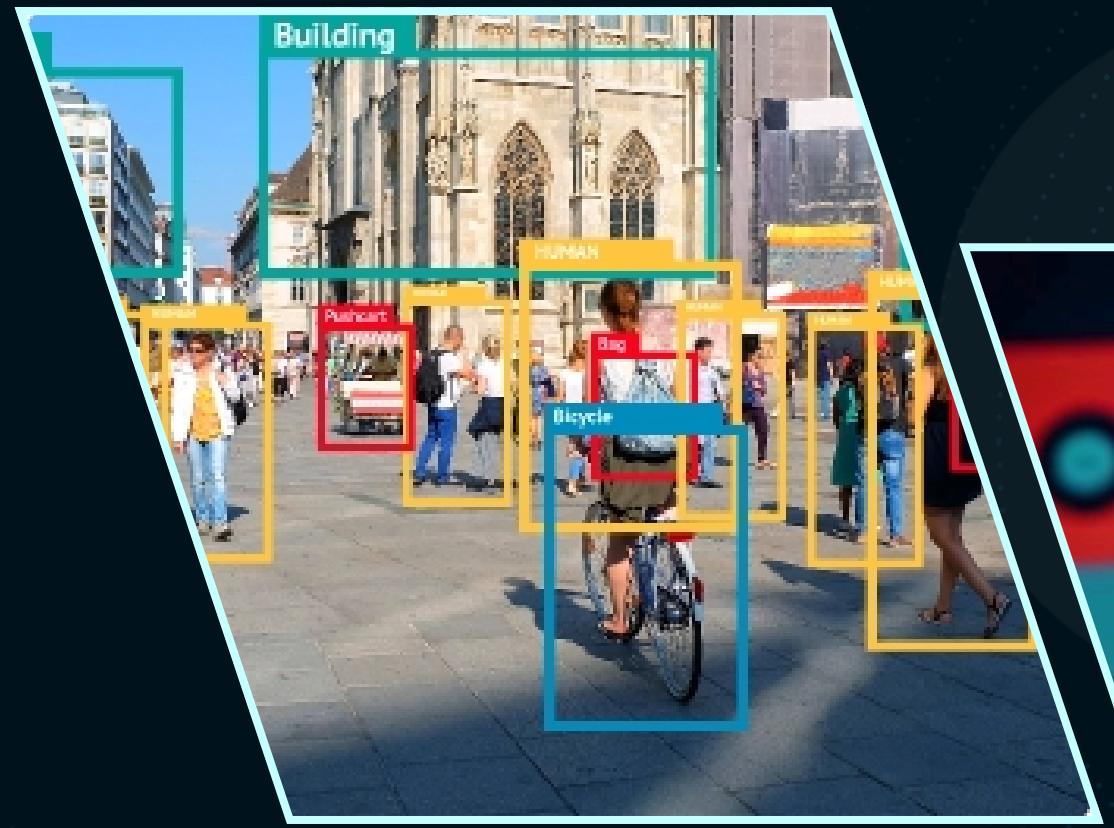
Challenges

Enhancement

Conclusion

Conclusion

- Developed a real-time video analysis system that integrates multiple AI-driven features
- Delivered a robust solution using Python, Flask, YOLO, and OpenCV to detect objects, emotions, and motion
- Successfully demonstrated the prototype with potential for future scaling and deployment





QNA SESSION

**THANK
YOU**

