

Initial thoughts on the problem of analysing truck drivers visually for various violations and events

Ahish.V

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PROBLEM:

The problem Definition as I understand it:

- Detect violation of not wearing belts - **ACHIEVED**
- People Count - **ACHIEVED**
- Face Detection - **ACHIEVED**
- Gait Detection(Mobile Phone Usage) - **To Be Achieved**
- Desktop Comprehensive Footage Analysis Tool - **Work in Progress**
- Fatigue Detection - **To Be Achieved**
- Event Based local recording - **Partially Achieved**

Additional things to be implemented:

- Camera Health monitoring
- Device Health
- System Status
- Cloud API based Analytics

SOLUTION:

Solution currently implemented for onboard event detection using OpenCV's face detection.

- Face recognition may be achieved through an OpenCV based library [clandmark](#). It seems to be a development over flandmark which is an accepted solution to the problem.
- Gait Detection may be achieved through a combination of eye tracking offered by clandmark and temporal correlations. Given an audio input from the cabin we might be able to achieve greater accuracy for such events.

- Fatigue detection may again be achieved through a combination of eye tracking, temporal correlations and location analysis through an input GPS feed if possible.
- Camera health monitoring might be implemented within the camera's API. I am not too sure about the information being extracted from the camera. I do not have enough information at hand about the hardware.

TENSORFLOW: All of the information I have at the moment suggests to me that tensorflow might be the most efficient path to our required solution. Although, I think I might see a possible solution using no Machine Learning since the data set (of about 350 drivers) is relatively small and might be done through image analysis and slightly complex parallelisation on a GPU to improve the TTS. With the availability of landmark, I think this solution might be more feasible than I initially thought.

Table of Libraries to the best of my knowledge

Require- ment	Pre-requisite(s)	Li- brary
Class(es)	Efficiency	
Driver Detection <u>cascade classifier</u>	no Meta Data needed	OpenCV
Verify Driver	driver details and previously trained data	