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

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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 acheive 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 clandmark, I think this solution might be more feasible than I initially thought.

Table of Libraries to the best of my knowledge

Re-quire-ment	Pre-requisite(s)	Library	Class(es)	Ef-fi-ciency
Driver De-tec-tion	no Meta Data needed	OpenCV, cland-mark, DLib	cascade classifier or use clandmark directly	
Ver-ify Driver	driver details and previously trained data			