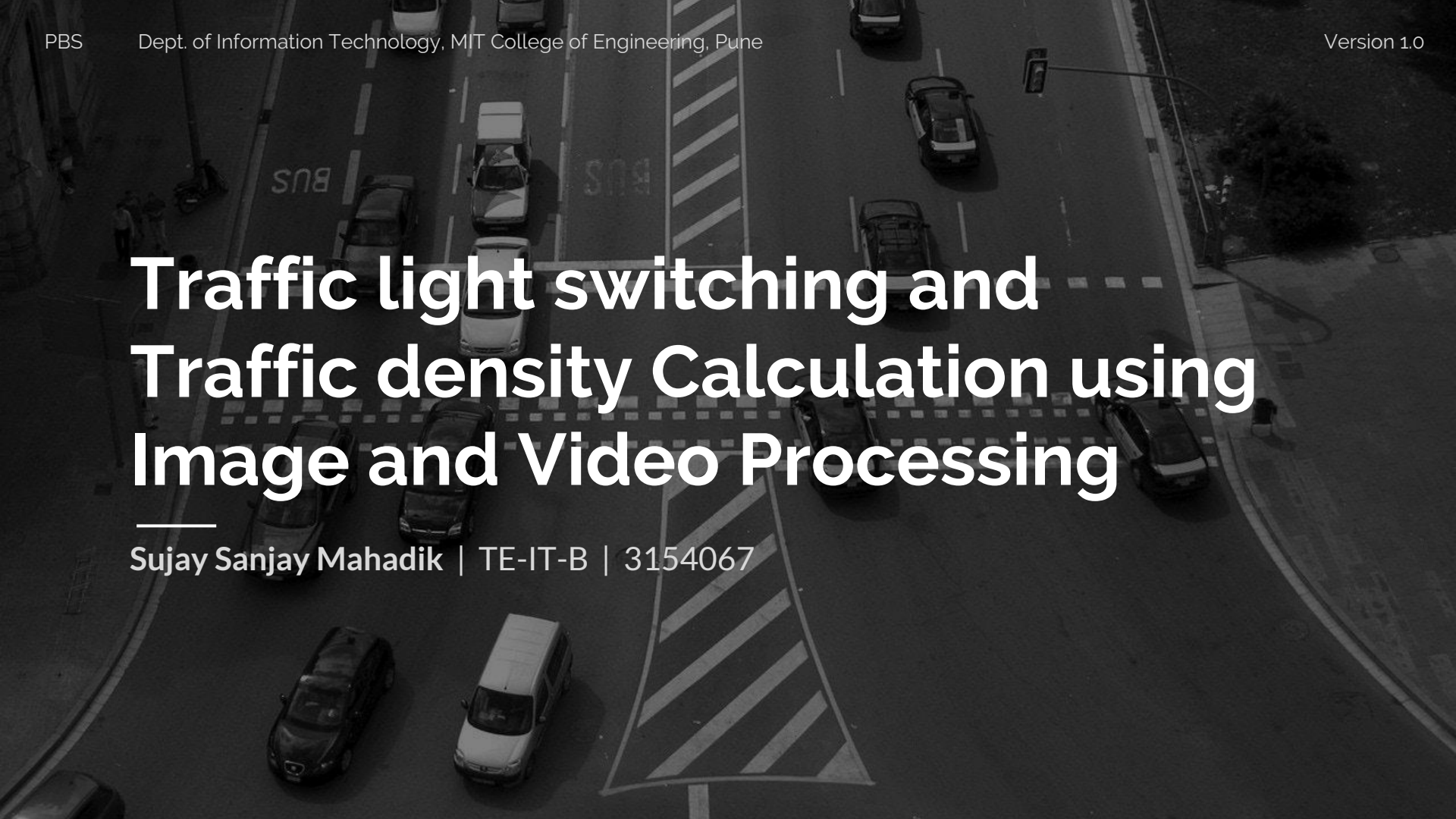

Traffic light switching and Traffic density Calculation using Image and Video Processing

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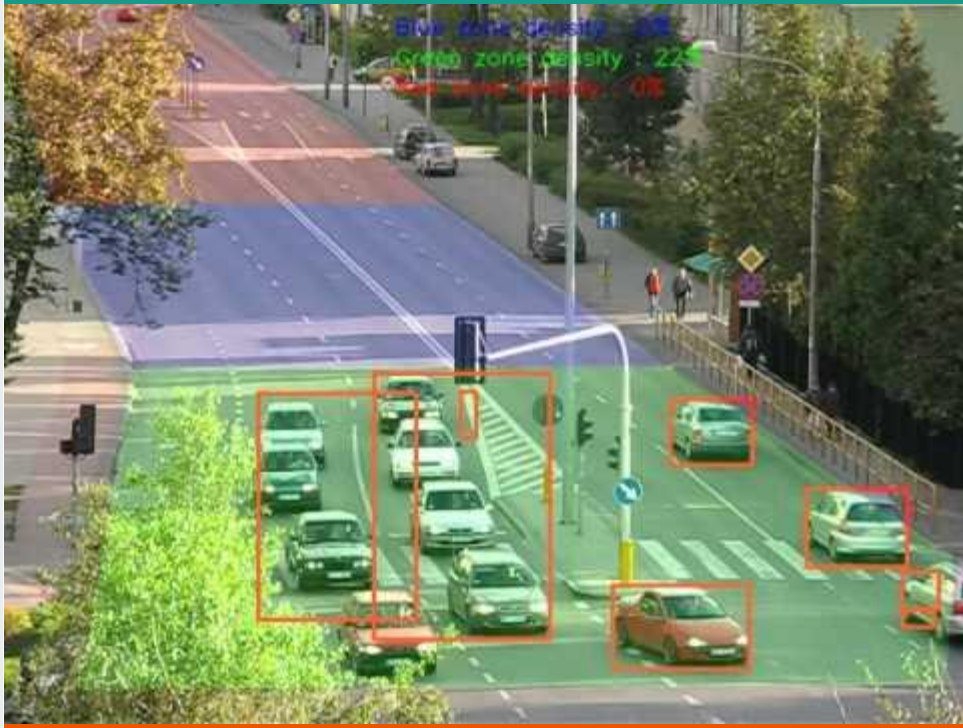
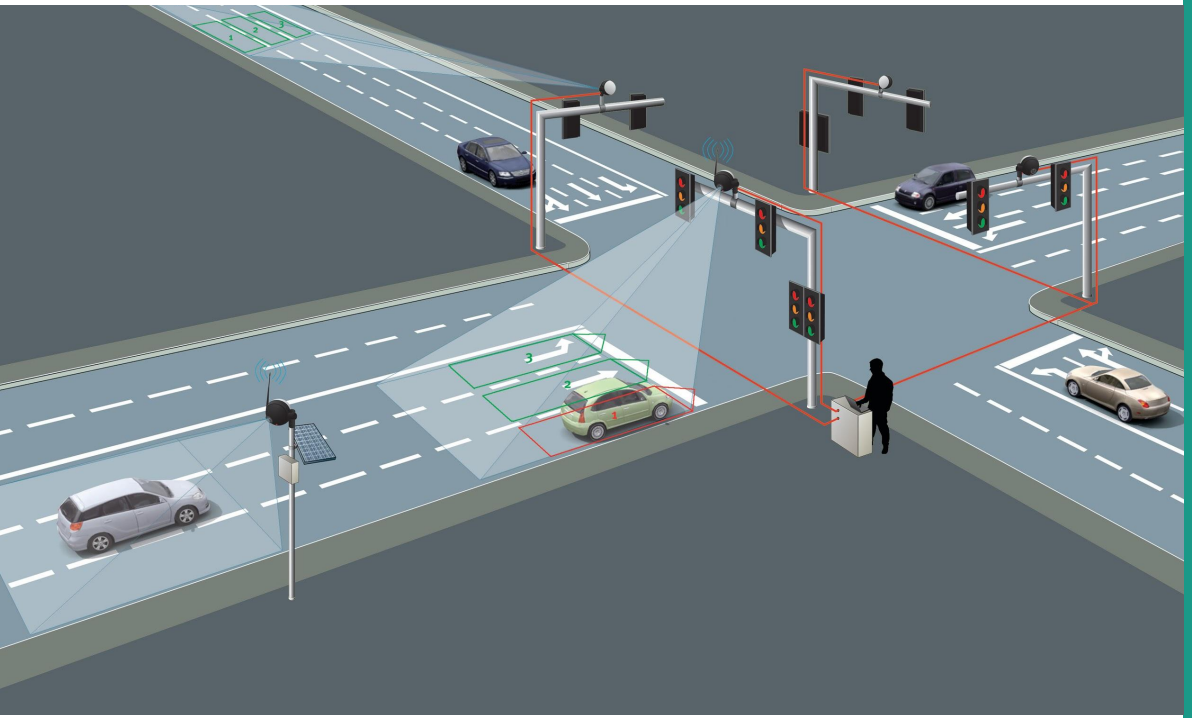
What is Image and Video Processing?

- Image processing is simply a form of signal processing for which the **input is an image**, such as photographs or frames of video.
- **Analysis and manipulation.**
- **Output** can be an **altered image or a report.**

Application of Image and Video Processing In Traffic density calculation



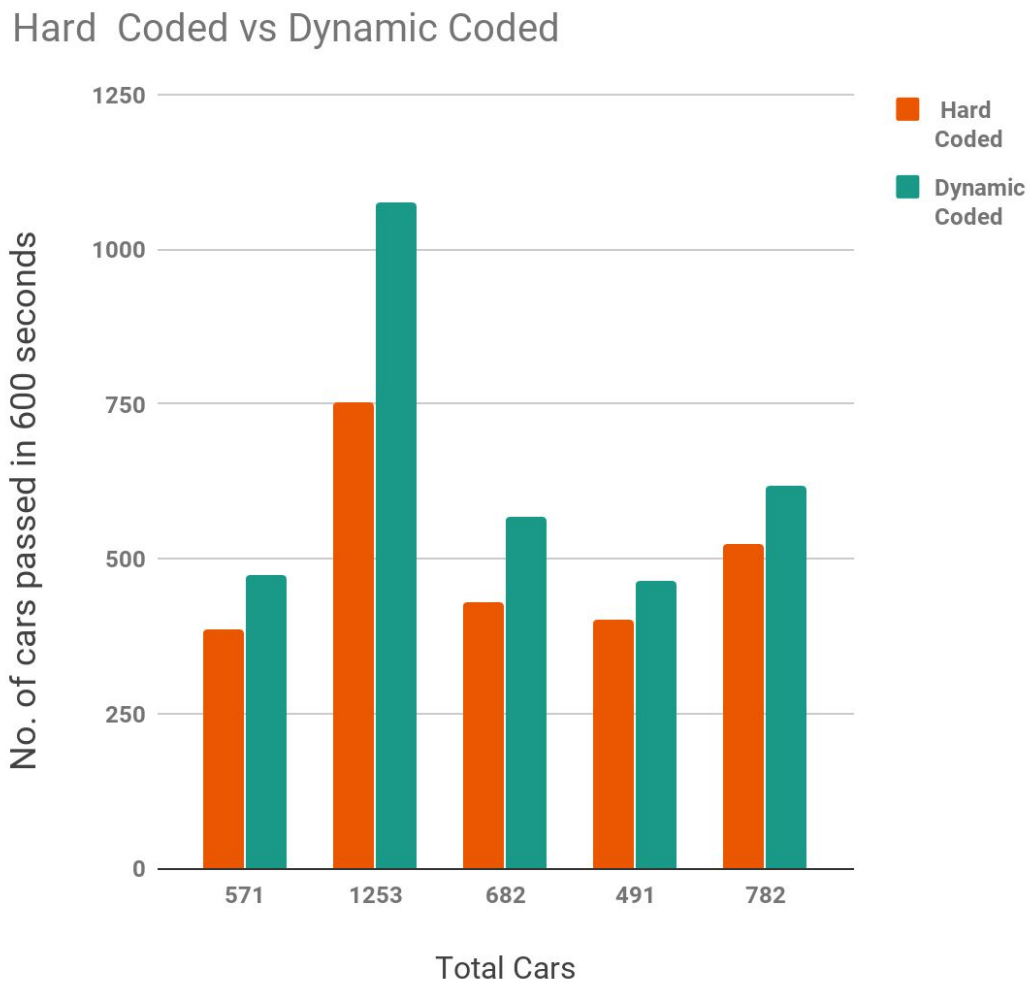


What is different in

Dynamic Traffic light Switching?

Experiment data

Here we have taken into account random number for each side such as **0, 1 or 2 cars can arrive per second** randomly and both the algorithms (Hard coded and Dynamic coded) are run on the same set of numbers for **600 secs.**

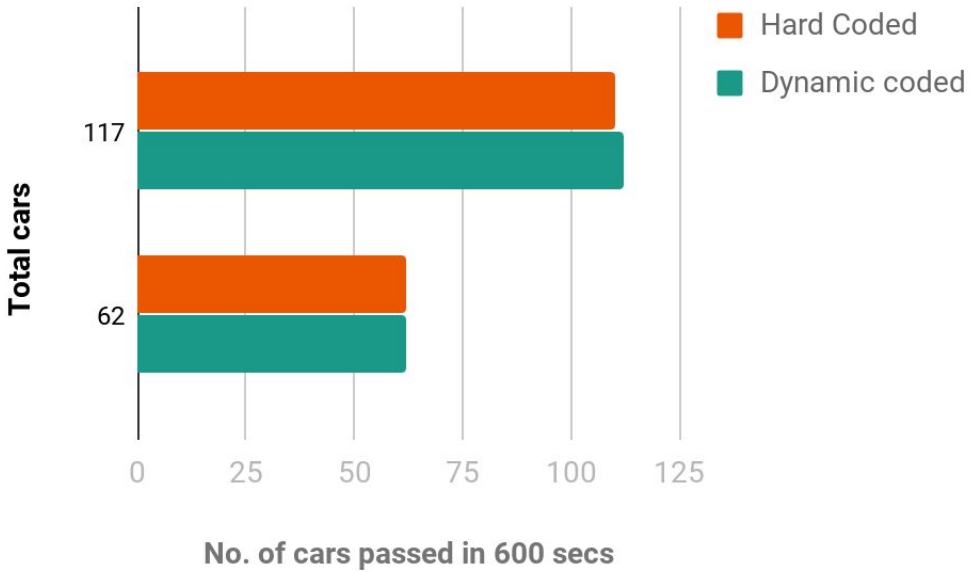


Results from:
[1] Smart Traffic Lights Switching and Traffic Density Calculation using Video Processing
http://ieeexplore.ieee.org/document/6799542/

Testing Instances and Results

Idle Time

Early Morning | 6 am to 8 am
Mid-night | 12 am to 2 am



Considering very low traffic density. **0 or 1 vehicle** adds up in every **10 seconds.**

- We don't see much difference in the number of cars passed.
- But the difference lies in the **aspect of waiting time**
- Worst case scenario:
  - **Hard coded - 180 secs.** (considering each signal requires 60 secs to turn back to green)
  - **Proposed Hard coded - 30 secs.** (considering each signal requires hard coded 10 secs for Idle Times)

- Density is **very high** on the roads majorly because of **office and school hours.**
- Dynamic coded algorithm on average has shown an **improvement of about 35%** above the Hard Coded system.

Peak Time

Morning	| 8 am to 10 am
Afternoon	| 4 pm to 6 pm

- During this time the number of vehicles can **range anywhere** between very high to very low.
- **Hard coded** systems are **undesirable** in such cases.
- **Dynamic coded** systems which alter the switching of traffic lights according to the traffic are **best suited.**

Normal Time

Late morning	10 am to 4 pm
Late night	8pm to 10 pm

Conclusion and Future prospects.

- Low installation cost and Negligible maintenance cost.
- Vehicle Recognition for EVs such as ambulances and Fire Engines.
- Spacious movement of vehicles.
- Scope of this project can be extended to **Coordination Control.**
- Data acquisition for future road design and construction.
- Improvements for junctions with higher waiting times.