Road Traffic Density Classification using Real Time Detection

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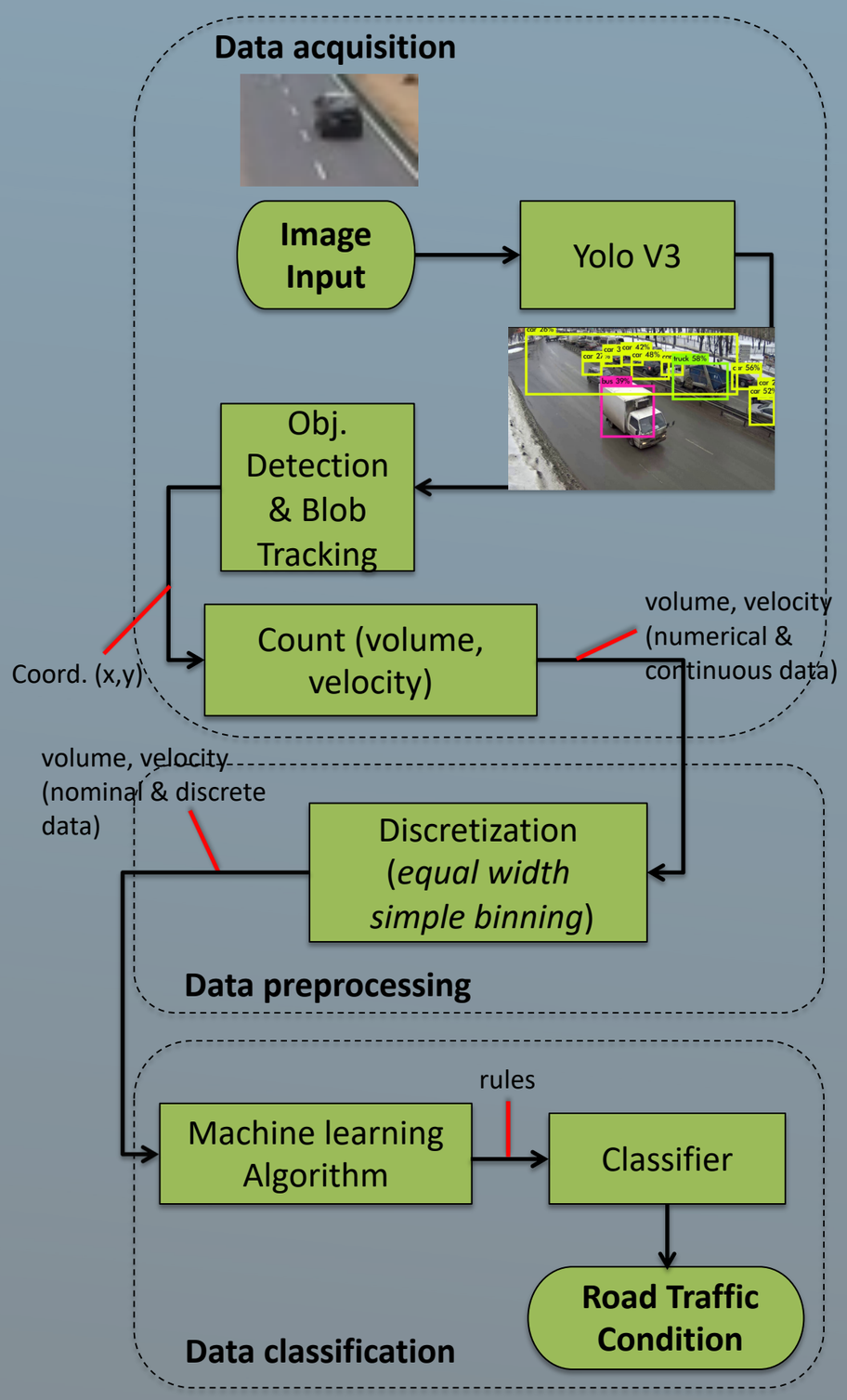
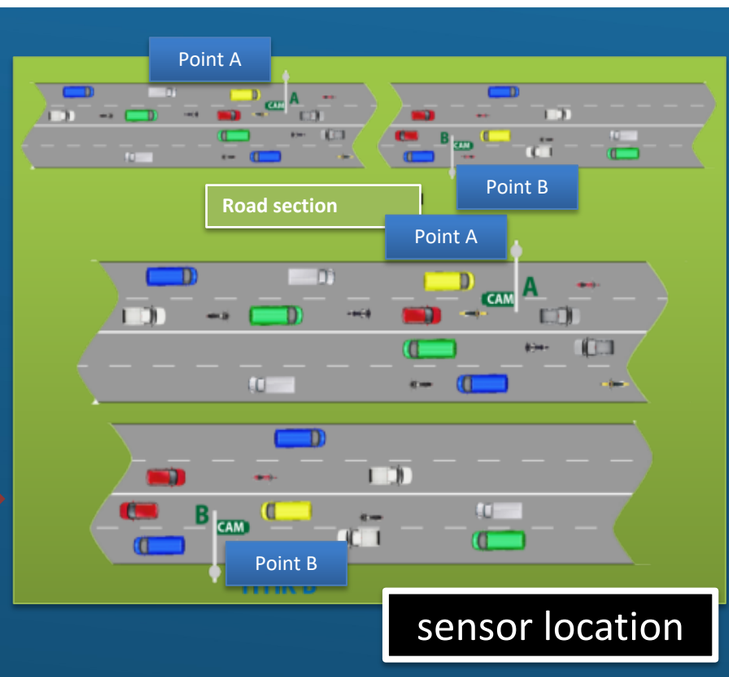
INTRODUCTION

The congestion problem can be solved by using ITS (Intelligent Transport System). ITS is a system to control a traffic was done through information technology where the data was collected directly from the field using sensor. In this study we will discuss about the methods that we used to process the traffic data into a road traffic density information.

FRAMEWORK



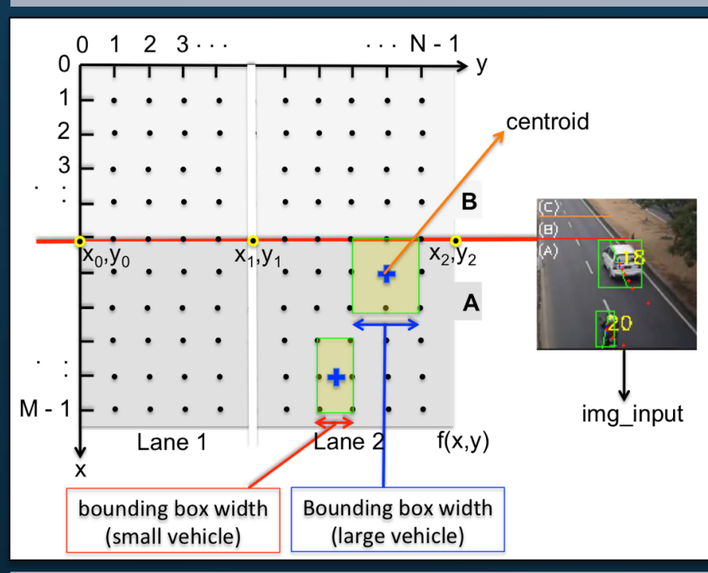


OBJECTIVE

Collect some data from sensor and extract them to get some information. This information can be used to manage the traffic and reduce the congestion.

APPROACH

Image input will be processed by deep learning methods. Here we used Yolo V3 for detecting vehicle as an object. After the vehicle being detected we used blob tracking to get the vehicle coordinate. In this case centroid is being used to gave an exact vehicle position in pixel coordinate (x, y). Last step in data acquisition is counting the number of vehicle by using counting line method. In here we also use multithreading application to reduce queue in frame processing.




```
Function Count(centroid, line, state )
1    BEGIN
2      i←0;
3      j←0;
4        If centroid.x < line.x
5          state←A;
6            Else state←B;
7              If currentstate != oldstate;
8                i++;
9            If y1 < lane2 < y2
10             j++;
11   END
```

EXPECTED RESULT

Compare to traditional model (background subtraction method) we expect:

-Improve the detection speed by 10%

-Improve the object detection accuracy by 5%

dashboard

Traditional Method

Application	second parameter (s)
w/o multithreading (1 video)	1.0568
w/multithread (1 videos)	0.512
w/multithread (2 videos)	0.718
w/multithread (3 videos)	0.6677
w/multithread (4 videos)	0.7093
w/multithread (5 videos)	0.7686

bsa algorithm	accuracy
PBAS[1]	87,59690
SigmaDelta[2]	85,27132

improve speed and accuracy

References:

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A. Manzanera and J. Richefeu, "A new motion detection algorithm based on sigma-delta background estimation," *Pattern Recognition Letters*, p. 320–328, 2007