Thesis Progress/Update Report

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**Tentative Titles: [Having Problem and Method]**

Title 1:

Title 2:

Title 3:

1. **Proposed Methodology with Graphical Representation:**

Dataset

Trained Model

Violation Detection

Mecahnism

Input Video Stream

violation Detected

Vehicle Images

Transforming video into Frames

License Plate Number

Traffic Rules

Database

**Novelty or Significant Points of The Proposed Model:**

1. Frame extrations from video stream
2. Detecting non permitted vehicles
3. Speed limit violation
4. Crosswalk violation
5. Helmet Detection
6. Lane Jump detection
7. Missing car detection

**C. List of related Good Quality Articles in Solving the Same or Similar Problem with different methods.**

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| --- | --- | --- | --- | --- | --- |
| **Sl.** | **Ref. and Year [Inverse]** | **Article Title** | **Method Name** | **Name of the Journal** | **Volume, Issue and Page** |
| 1 | Tonge et al. 2020[1] | Traffic Rules Violation Detection using  Deep Learning |  | IEEE |  |
| 2 | Franklin et al.  2020[2] | Traffic Signal Violation Detection using Artificial  Intelligence and Deep Learning |  | IEEE |  |
| 3 | Zhaoyang et al. 2020[3] | A motion based object detection method |  | IEEE |  |
| 4 | Hou et al. 2020[4] | Video road vehicle detection and tracking based on OpenCV |  | IEEE |  |
| 5 | Kulkarni et al.  2020[5] | Real Time Vehicle Detection, Tracking and Counting Using Raspberry-Pi |  | IEEE |  |

**D. List and Notes of Articles Closely Related to Our Method**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sl.** | **Ref. and Year** | **Article Title** | **Method Name** | **Name of the Journal** | **Volume, Issue and Page** |
| R1 | Tonge et al. 2020[1] | Traffic Rules Violation Detection using  Deep Learning |  | IEEE |  |
| R2 | Franklin et al.  2020[2] | Traffic Signal Violation Detection using Artificial  Intelligence and Deep Learning |  | IEEE |  |
| R3 |  |  |  |  |  |
| R4 |  |  |  |  |  |
| R5 |  |  |  |  |  |

**Identification of difference or significance of our method comparing with individual ones:**

Comparison and Construct with respect to R1:

In this paper, the two types of violation detection method is done. And the process of the whole method is to

\* Detect vehicle

\* Helmet classification

\* Crosswalk violation

\* License plate recognition

The differences between our model with this paper's approach are that :

1. On the paper, they used the YOLO model with pretrained weights. But where we trained our model with YOLOv5 architecture which is an updated version of YOLO, with Bangladeshi vehicle images. For this reason, the recognition of vehicles is much better than the pre-trained weights.
2. For license plate recognition in this paper, the model used is based on a YOLO-based trained model to detect license plates and then use OCR to detect letters from the license plate image. But we are using an OpenCV approach for detecting license plates by finding contours in the images. Our approach could be better than the trained model approach. We are currently working on a training model with license plate images to find out.
3. This paper only proposed detecting two types of violations. Our proposed model will work on detecting 5 types of traffic rule violations.
4. We are planning to work on both helmet classification and crosswalk violation with a different approach using OpenCV.
5. Dataset used for testing is around 1000 images. We are planned to perform testing of more than 1000 images to find out a better evaluation of our method.

Comparison and Construct with respect to R2:

In this paper, a method of speed violation detection and lane jump detection is shown. The model used in this paper is YOLOv3.

We are planned to implement the same features using the OpenCV approach by using a motion detection technique. Because of this approach, our model will be able to detect violation of the speed limit and lane jump in various vehicle classes.

**References:**

[1] Aniruddha Tonge, Shashank Chandak, Renuka Khiste, Usman Khan, "Traffic Rules Violation Detection using Deep Learning", IEEE Xplore, doi:[10.1109/ICECA49313.2020.9297495](https://doi.org/10.1109/ICECA49313.2020.9297495" \t "/home/akib/Documents\\x/_blank)

[2] Ruben J Franklin, Mohana, "Traffic Signal Violation Detection using Artificial

Intelligence and Deep Learning", IEEE Xplore,

doi:[10.1109/ICCES48766.2020.9137873](https://doi.org/10.1109/ICCES48766.2020.9137873" \t "/home/akib/Documents\\x/_blank)

[3] Chen Zhaoyang, Gao Haolin, Wang Kun, "A motion based object detection method", IEEE Xplore, doi:[10.1109/ITCA52113.2020.00067](https://doi.org/10.1109/ITCA52113.2020.00067" \t "/home/akib/Documents\\x/_blank)

[4] Wei Hou, Dongsheng Xia, Hoekyung Jung, "Video road vehicle detection and tracking based on OpenCV", IEEE Xplore, doi: [10.1109/ICISE51755.2020.00076](https://doi.org/10.1109/ICISE51755.2020.00076" \t "/home/akib/Documents\\x/_blank)

[5] Apeksha P Kulkarni, Vishwanath P Baligar, "Real Time Vehicle Detection, Tracking and

Counting Using Raspberry-Pi", IEEE Xplore, doi: [10.1109/ICIMIA48430.2020.9074944](https://doi.org/10.1109/ICIMIA48430.2020.9074944" \t "/home/akib/Documents\\x/_blank)