

# Traffic Detection with yolov5

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## Summary

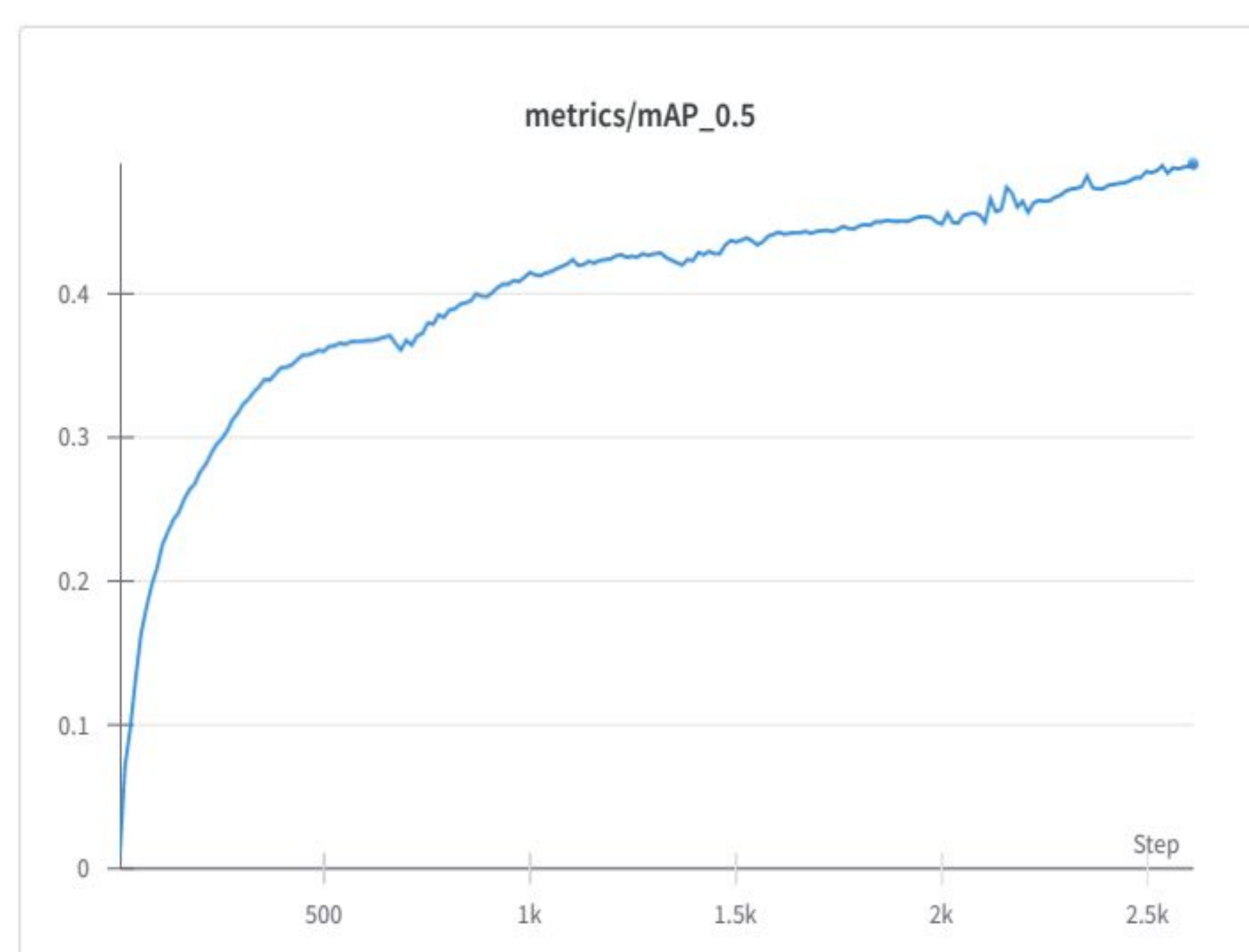
Traffic congestion in Dhaka is a huge problem. To tackle this, we use AI to detect different types of vehicles. This data can then be used in the future to eradicate traffic.

## Methods used

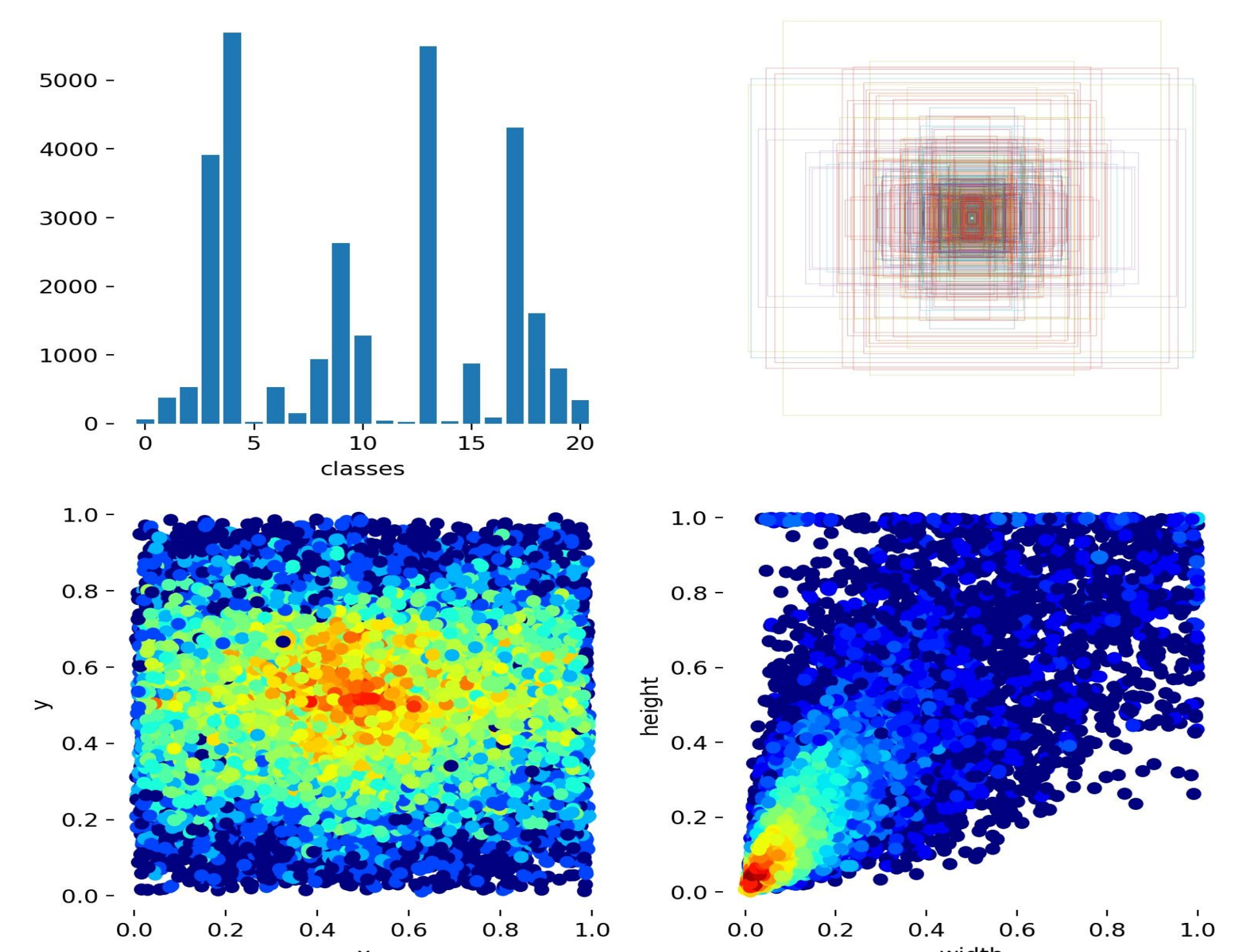
- State of the art yolov5 model. Specifically yolov5x which is famous for its fast learning and good accuracy.
- Batch size of 16 was used.
- Models with different hyperparameters were trained and **ensembled** to give better results in inference.
- Augmentation techniques were applied to make the dataset more diversified and generate better learning of weights.
- The training set was rigorously analyzed and some shortcomings in detection were spotted like : horizontal bicycles, horizontal rickshaw, differentiating Truck and Pickup, differentiating Cars, Minivans and Suvs, Low light images and partially visible objects.
- After round 1, we annotated the test dataset of round 1 and also used custom datasets available on the Internet to improve our model.

## Results

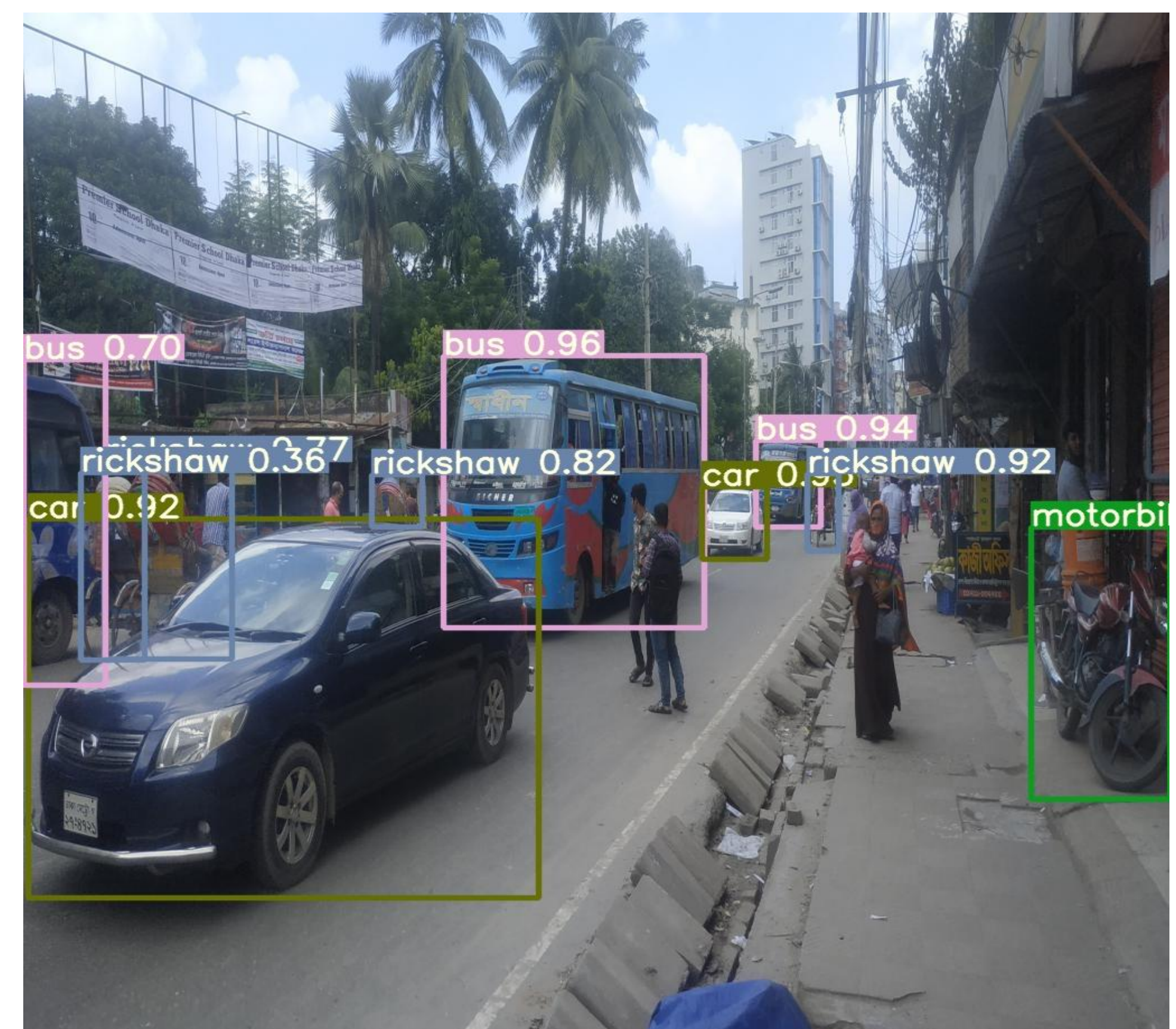
- One such model's mAP which was trained for 200 epochs in round 2.



- Summary of class labels and bounding boxes after training :



- A typical inference image (on round 2 test dataset)



## References

### Model used -

yolov5x (<https://github.com/ultralytics/yolov5>)

### Datasets used -

- 1) Training dataset provided by DhakaAI [1]
- 2) Poribohon-BD [2]
- 3) vehicle-dataset [3]
- 3) Test dataset for round 1 (annotated ourselves after the end of round 1) [1]