Parallelized Number Plate Detection System Using OpenCV & OpenMP in C++

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**Introduction**

In this current day and age, image processing and task automation is being applied to the field of policing and a number plate detection system can help digitalize this process to provide ease to law enforcement agencies. Such a system can be used in a wide array of scenarios from catching over-speeding drivers to tracking criminal vehicle movement.

In conventional (serialized) systems, the number of vehicles present in a camera frame can greatly impact how efficiently and quickly the detection system works. Serial programs tend to choke in this sort of usage scenario.

**Objectives**

We aim to implement a system in C++ that can first detect (multiple) number plates from a video stream. These detected number plates will be cropped from the video frame and individually processed to detect characters in the image. The characters will then be run through a recognition engine to finally output a corresponding string of characters. The image and the recognized plate number can then be stored for use.

To make sure the program runs efficiently and provides major speedups over traditional systems, all image processing will be handled using OpenCV, with OpenMP being used to parallelize the entire process.