

Privatization Effect on License Plate Recognition



Korcan Uyanik
School of Engineering Science

BACKGROUND:

This study evaluates a soon to be published model that alters license plates images such that constructing original image is difficult, but high analytics accuracy is still preserved.

METHODS

1. Gathered license plate images from Cityscape Dataset annotated and bounded license plates by finding license plate coordinates.
2. Gathered altered images developed by others in the research group.
3. Evaluated images on a machine learning model to and gathered metrics such as vehicle count, mean squared error, Levenshtein distance of license plates between original and altered images.

RESULTS

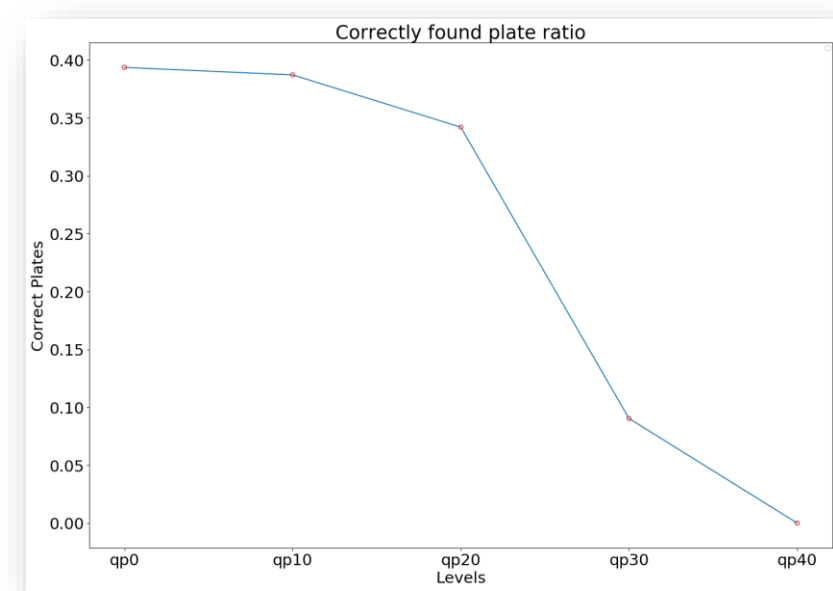


Fig. 1. Correctly found plate ratio per level

Discussion

- Depending on the results, model can change, and improvements can be made in future.

Initial Findings



Fig. 2. Level 2 and Level 3 alteration

Per character operation needed to correct the predicted license plates is stable till 2nd level. High analytics accuracy can be preserved if privatization is bounded by 2nd level.

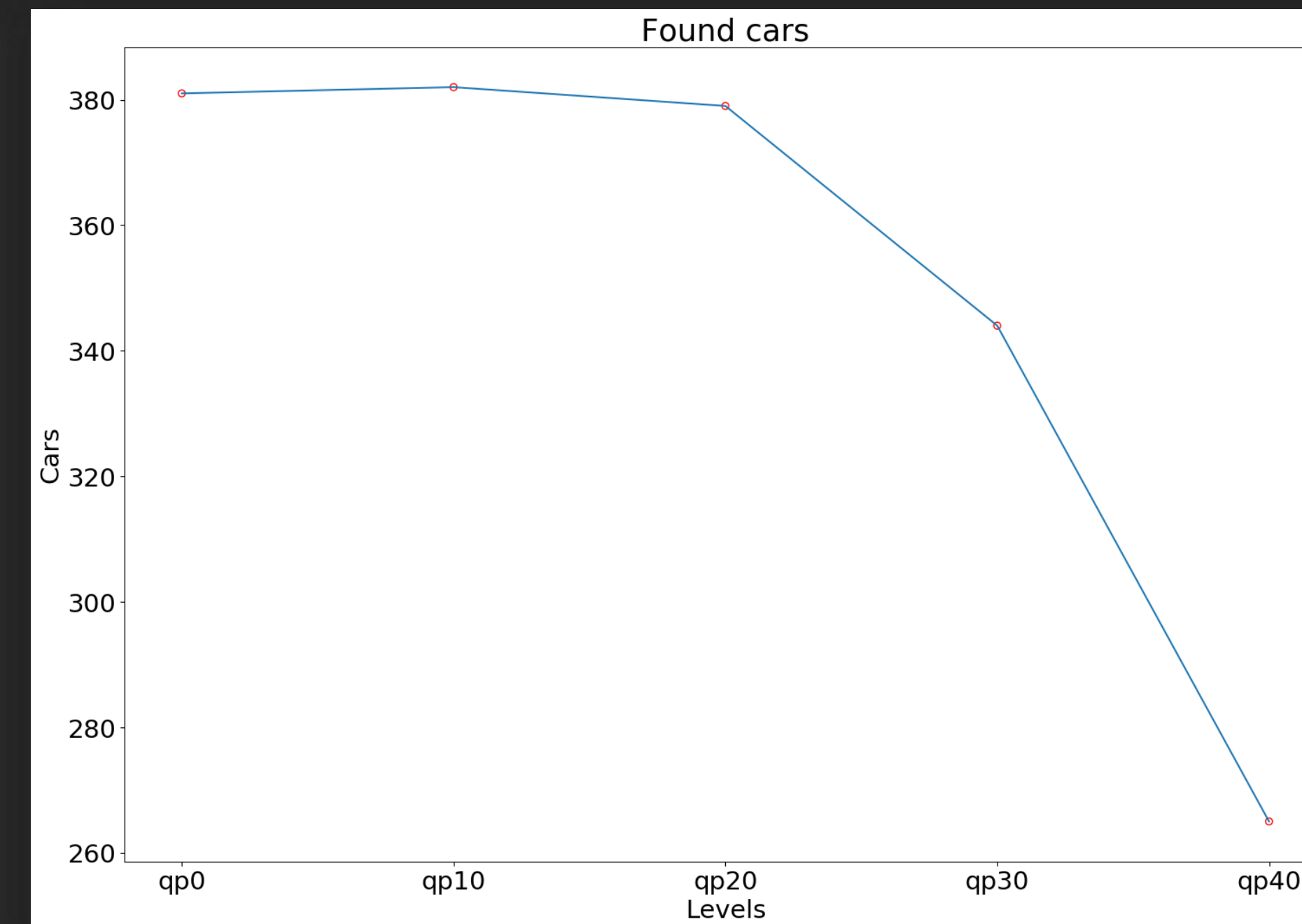
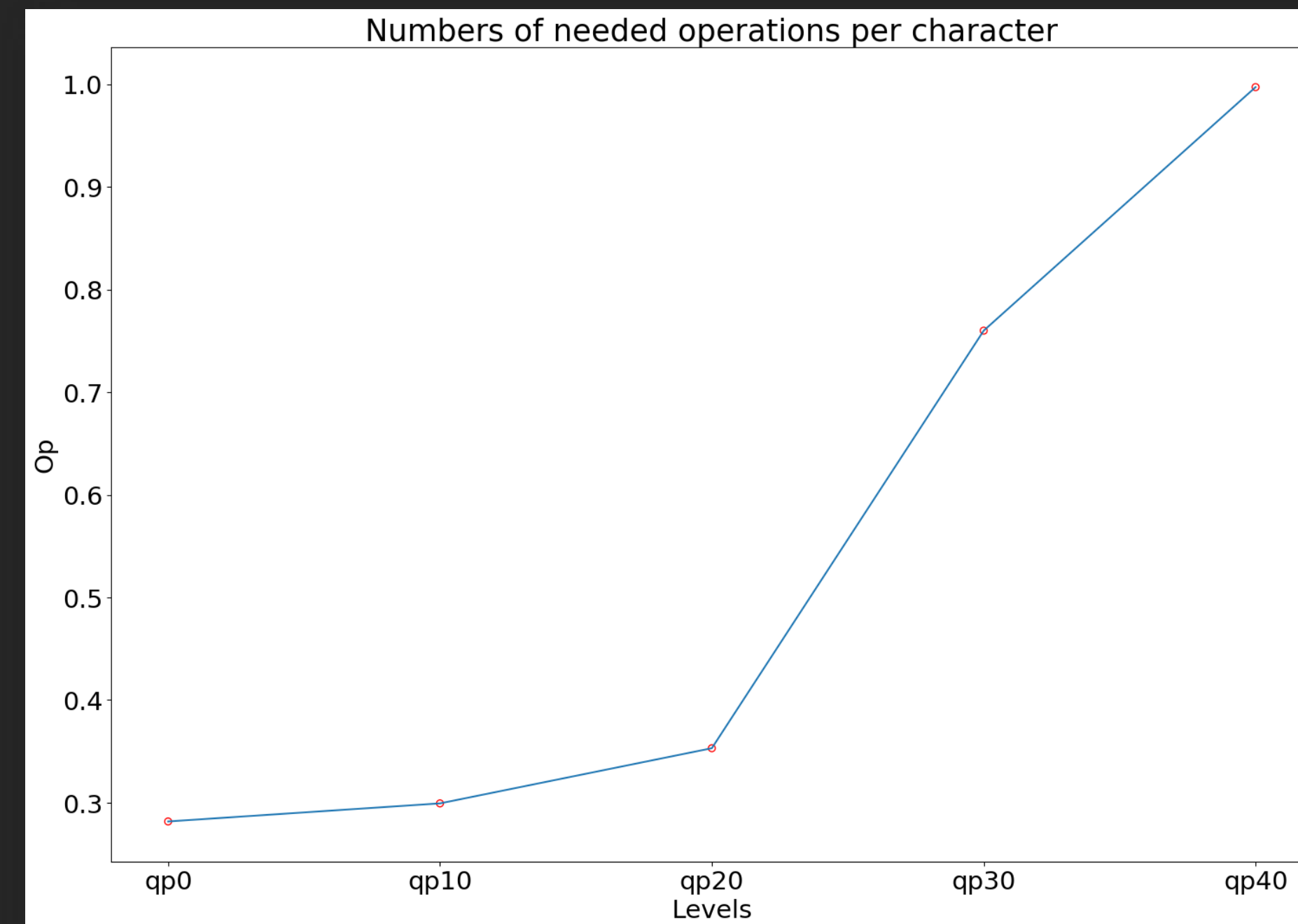


Fig. 3. Number of operations that a predicted character needs for correction, and found cars per level

There seems to be a correlation between found cars and accuracy. It seems privatization is preventing the vehicle detection before affecting the license plate recognition.

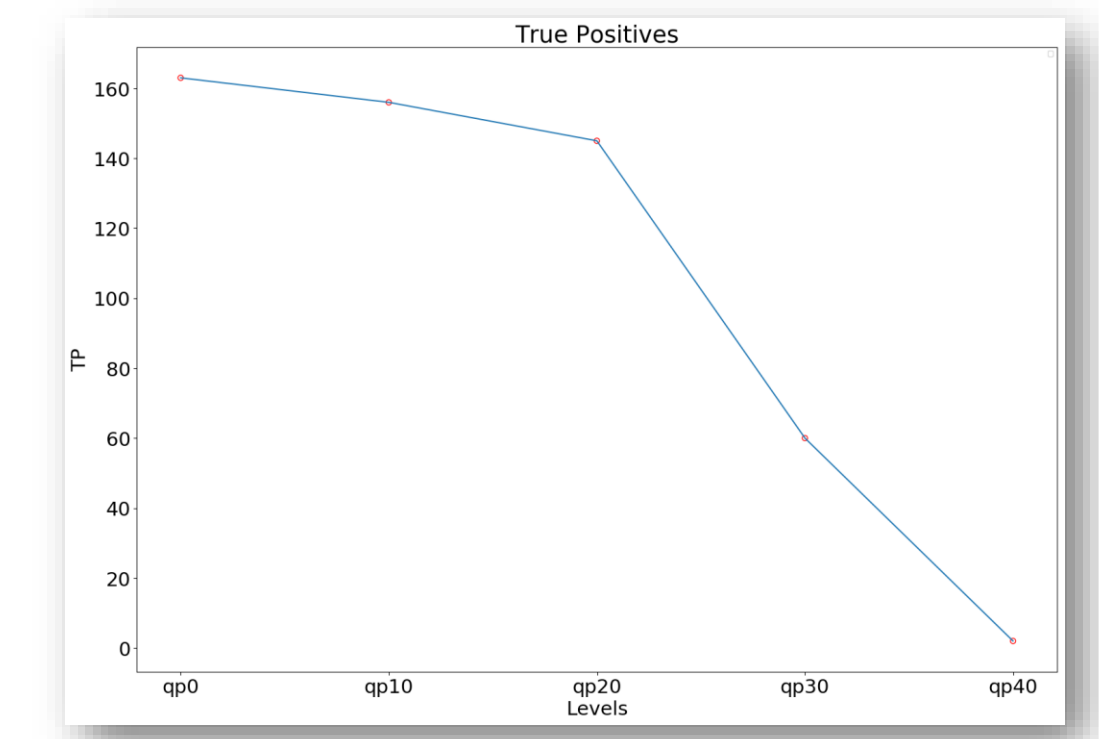


Fig. 4. True positives per level.

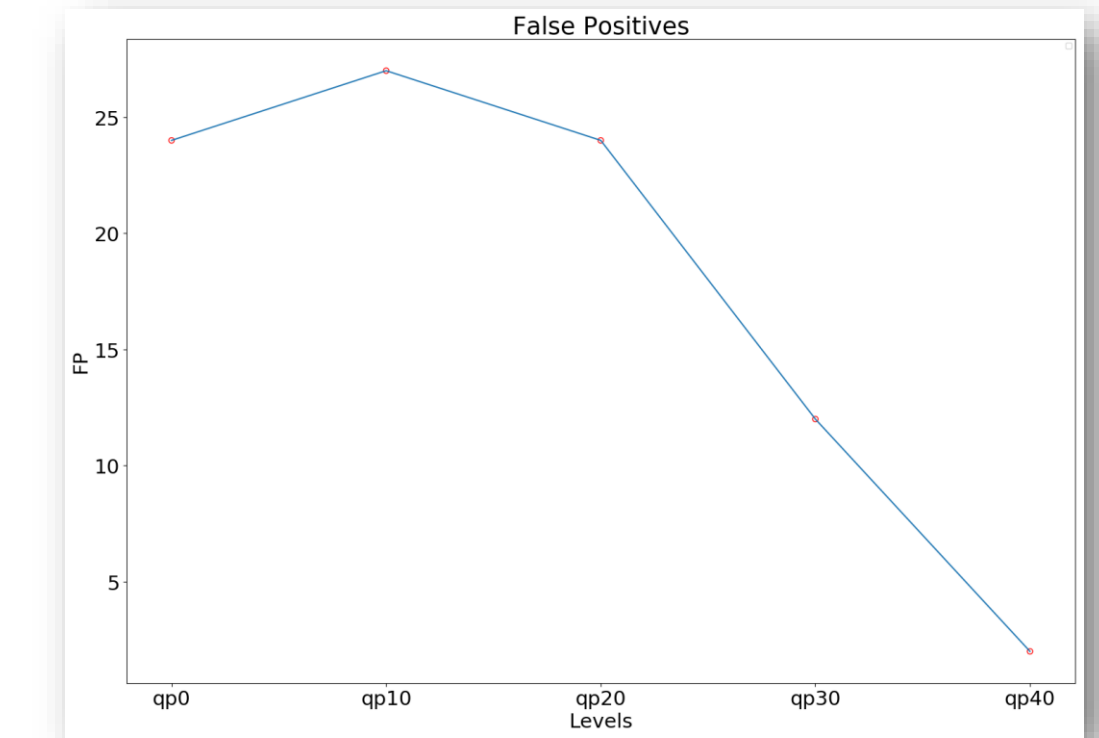


Fig.5. False positives per level.

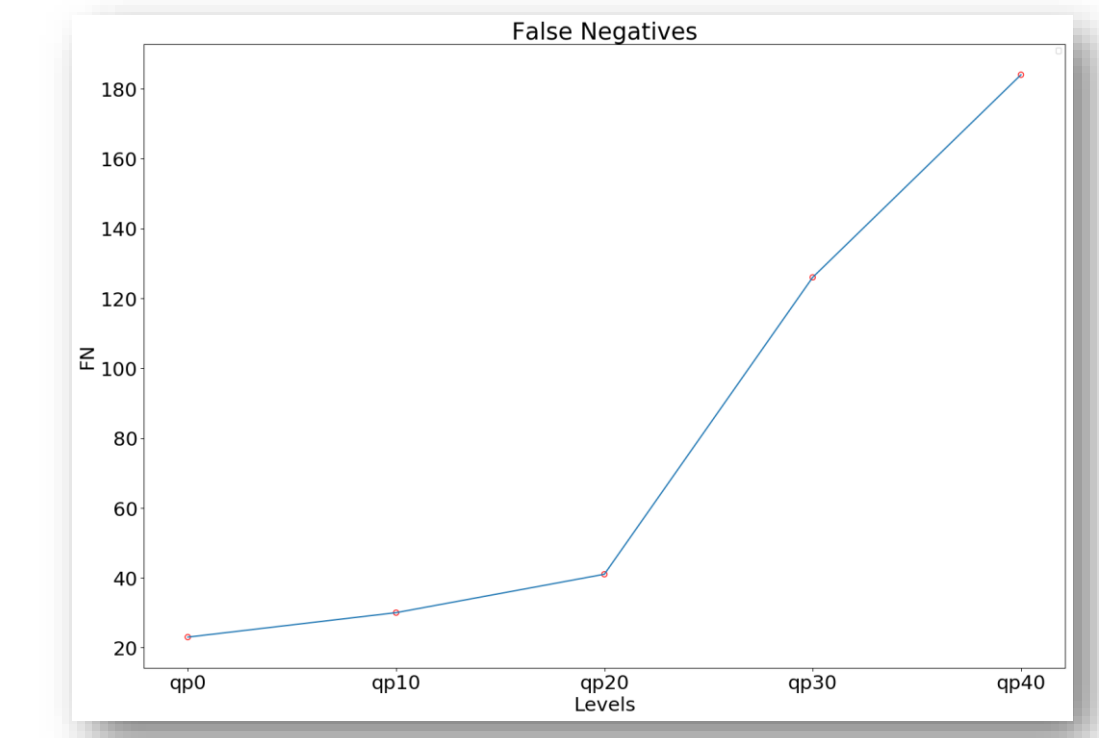


Fig.6. False negatives per level.



Fig.7. Large level privatized image.

Korcan Uyanik, kuyanik@sfu.ca