A Program for Vehicle License Plate Recognition

Nguyễn Tiến Đạt
Thai Nguyen University of Information and Communication Technology
Thai Nguyen University, Thai Nguyen, Vietnam
student577@ictu.edu.vn

***Abstract*—This undergraduate thesis investigates a vehicle license plate recognition program. Automated recognition requires finding the plate, separating its characters, and reading them from an image. The student reviews image processing, object detection, plate localization, character segmentation, and recognition. The report describes Python, OpenCV, and a program implementation with example output. The conclusion reports a completed student report and program with basic functions. It acknowledges time and knowledge limits and proposes further study of newer plate-recognition techniques. No field accuracy or deployment claim is made. The source does not establish robust recognition under varied lighting, camera angles, or plate conditions. Its discussion does not provide a field evaluation with a representative labelled test set. The contribution is a documented student study or prototype whose stated scope can guide further testing.**

***Index Terms*—license plate recognition, OpenCV, Python, computer vision**

I. Introduction

Automated recognition requires finding the plate, separating its characters, and reading them from an image. This thesis investigates a vehicle license plate recognition program. It begins from a practical engineering need and explains the technologies and workflow chosen for the case. The objective is to document a student implementation or comparative investigation, together with the evidence available in the manuscript. Broader operational or economic effects require separate measurements and are not assumed from the existence of a prototype [1]. Earlier ICTU student work on related designs is included here for context [2], [3], [4]. Related published studies provide context for the subject and methods [5], [6], [7], [8], [9], [10]. These contextual works were selected for this English summary; they are not asserted to appear in the original thesis bibliography.

II. Methods

The student reviews image processing, object detection, plate localization, character segmentation, and recognition. The report describes Python, OpenCV, and a program implementation with example output. The source is summarized through its stated design, implementation material, examples, and conclusion. Features shown in the manuscript are distinguished from proposals for later development. This review does not add a new experiment, fill missing measurements with estimates, or treat a planned capability as an observed result. The source thesis remains the provenance for the reported work [1].

Supervisor: Bùi Anh Tú, Thai Nguyen University of Information and Communication Technology (batu@ictu.edu.vn).

III. Results

The conclusion reports a completed student report and program with basic functions. It acknowledges time and knowledge limits and proposes further study of newer plate-recognition techniques. No field accuracy or deployment claim is made. The report's screens, configurations, examples, or measurements constitute the evidence for this summary. A capability described only as a design intention is not counted as a validated operational outcome. No additional performance, adoption, financial, or safety figure has been introduced here. The result is interpreted within the scope of the student's documented setup [1].

IV. Discussion

The source does not establish robust recognition under varied lighting, camera angles, or plate conditions. Its discussion does not provide a field evaluation with a representative labelled test set. A future evaluation could use a labelled plate dataset and report detection, character-recognition, and end-to-end accuracy separately. These limitations affect how the evidence should be read. The current manuscript can support understanding of the design and reported demonstration, while independent tests would be needed for stronger claims. Any later deployment should document its environment and separate observed outcomes from intended benefits [1].

V. Conclusion

The thesis documents a vehicle license plate recognition program. The conclusion reports a completed student report and program with basic functions. It acknowledges time and knowledge limits and proposes further study of newer plate-recognition techniques. No field accuracy or deployment claim is made. The source does not establish robust recognition under varied lighting, camera angles, or plate conditions. Its discussion does not provide a field evaluation with a representative labelled test set. A future evaluation could use a labelled plate dataset and report detection, character-recognition, and end-to-end accuracy separately. Accordingly, the present contribution is a source-grounded account of the student work and its tested or illustrated scope. Claims about broader effectiveness should be assessed in later work using explicit evaluation conditions [1].

References

[1] Nguyễn Tiến Đạt, ”A Program for Vehicle License Plate Recognition,” internal undergraduate thesis (original in Vietnamese), Thai Nguyen University of Information and Communication Technology, 2024.

[2] ICTU Student 203, ”Construction of a Character Recognition Program,” internal undergraduate thesis, Thai Nguyen University of Information and Communication Technology, 2010.

[3] ICTU Student 51, ”Character Recognition and Automated Grading of Multiple-Choice Tests,” internal undergraduate thesis, Thai Nguyen University of Information and Communication Technology, 2008.

[4] Nguyễn Minh Tuấn, ”Construction of a Face Recognition Program for Family Robots,” internal undergraduate thesis, Thai Nguyen University of Information and Communication Technology, 2021.

[5] Pratiksha Jain et al., ”Automatic License Plate Recognition using OpenCV,” International Journal of Computer Applications Technology and Research, 2014. doi:10.7753/ijcatr0312.1001.

[6] Abdillah Komarudin et al., ”Designing License Plate Identification through Digital Images with OpenCV,” Procedia Computer Science, 2015. doi:10.1016/j.procs.2015.07.517.

[7] Deeksha N et al., ”LICENSE PLATE DETECTION METHODS BASED ON OPENCV,” International Research Journal of Computer Science, 2022. doi:10.26562/irjcs.2022.v0908.31.

[8] Sanjay Tippannavar et al., ”License Plate Recognition for Indian Vehicles based on Image Processing using OpenCV,” International Journal of Innovative Research in Advanced Engineering, 2023. doi:10.26562/ijirae.2023.v1003.10.

[9] Poonam Bhogale et al., ”Vehicle License Plate Detection and Recognition System,” International Journal of Computer Applications, 2016. doi:10.5120/ijca2016908924.

[10] Dao Trung Kien et al., ”A Literature Review on License Plate Recognition and Vehicle Classification,” Journal of Research and Development on Information and Communication Technology, 2012. doi:10.32913/mic-ict-research.v3.n9.337.