# License Plate Recognition for a Smart Parking Prototype

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***Abstract*—This undergraduate thesis investigates license plate detection and character recognition for a smart-parking prototype. Parking systems can use camera images to associate a vehicle with a recorded entry or exit. The author studies object detection and optical character recognition and builds a simulation using YOLO, PaddleOCR, image processing, a graphical interface, and a small data store. The report includes application code and example screens. The thesis presents a prototype that detects a plate region and reads characters in selected images or video. Its conclusion recognizes that accuracy and performance need improvement. Finding a vehicle location inside the car park is proposed as later work. No large independently labeled benchmark, robust lighting study, or real car-park deployment is documented. A demonstration cannot establish dependable entry control across varied plates and camera angles. The contribution is a documented student study or prototype whose stated scope can guide further testing.**

***Index Terms*—license plate recognition, YOLO, PaddleOCR, smart parking**

## I. Introduction

Parking systems can use camera images to associate a vehicle with a recorded entry or exit. This thesis investigates license plate detection and character recognition for a smart-parking prototype. 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 author studies object detection and optical character recognition and builds a simulation using YOLO, PaddleOCR, image processing, a graphical interface, and a small data store. The report includes application code and example screens. 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].

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## III. Results

The thesis presents a prototype that detects a plate region and reads characters in selected images or video. Its conclusion recognizes that accuracy and performance need improvement. Finding a vehicle location inside the car park is proposed as later work. 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

No large independently labeled benchmark, robust lighting study, or real car-park deployment is documented. A demonstration cannot establish dependable entry control across varied plates and camera angles. Future evaluation could report character error, missed plates, processing time, and failure cases across camera positions and weather conditions. 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 license plate detection and character recognition for a smart-parking prototype. The thesis presents a prototype that detects a plate region and reads characters in selected images or video. Its conclusion recognizes that accuracy and performance need improvement. Finding a vehicle location inside the car park is proposed as later work. No large independently labeled benchmark, robust lighting study, or real car-park deployment is documented. A demonstration cannot establish dependable entry control across varied plates and camera angles. Future evaluation could report character

error, missed plates, processing time, and failure cases across camera positions and weather conditions. 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


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