

Summary of “Machine Vision Based Smart Parking System Using Internet of Things”

The purpose of this document is to summarize the article by Daniel Ng Chiu Loong et al. where the development process of a smart parking app is outlined. The first section discusses the importance of developing a cheap and effective way to manage parking in large cities. The second section discusses methods Ng Chiu Loong et al. uses to detect if a parking spot is taken. The third section discusses potential challenges in developing such a system. The final section will discuss results and the feasibility of the smart parking system.

According to the UN, 55% of the world’s population lives in urban areas. For people in large cities, it is becoming increasingly difficult to find an open parking space. This problem is contributing to traffic and costing drivers time and fuel. Methods to detect open parking spots such as magnetic sensors, microwave radar, and ultrasonic sensors are expensive and tend to only be designed for indoor parking. Because of the drawbacks of existing methods, Ng Chiu Loong et al. use machine vision techniques and the Internet of Things to detect parking spaces.

In computer science, *machine vision*, also called *computer vision*, is a field which works on enabling computers to interpret digital images. *Internet of Things* refers to the idea of connecting devices and everyday objects to the internet in order to send and receive information. Knowing these techniques, Ng Chiu Loong et al. connect a parking lot camera to the internet in order to receive and process the video. Ng Chiu Loong et al. use these techniques to determine whether a car is taking up a parking space or not.

Potential problems include anything obstructing the camera’s view of the parking space or an unexpected object in the camera’s view. Common obstructions include weather, pedestrians, bicycles, construction, etc. Another challenge is detecting open parking spaces at night. By using a red shifted camera, Ng Chiu Loong et al. remedy the low light at night problem. By implementing a more sophisticated computer vision technique called “Canny Edge Detection”, Ng Chiu Loong et al. are able to mitigate distractions.

Over the course of the experiment, the Smart Parking System was able to determine whether a spot was taken or not with 96.4% accuracy. The system made an inaccurate judgement only when it was cloudy or raining with low light. Ng Chiu Loong et al. determined if a higher quality camera and a more powerful computer is used, the accuracy will increase even further.

The purpose of this document is to summarize the article by Ng Chiu Loong et al. where the development process of a smart parking app using machine vision is outlined. A smart parking system is cheaper and more scalable than other methods to detect open parking spaces. By using the latest technology in machine vision, open parking spaces can be detected with 96.4% accuracy. A smart parking system using machine vision and Internet of Things is cheap, scalable, and reliable way to detect open parking spaces.

Ng Chiu Loong, Daniel, et al. “Machine Vision Based Smart Parking System Using Internet of Things.” *Telkomnika*, vol. 17, no. 4, Aug. 2019, pp. 2098–2106. *EBSCOhost*, doi:10.12928/TELKOMNIKA.v17i4.12772.