DEVELOPMENT OF A RASPBERRY PI 2-BASED REAL-TIME VIDEO PARKING ASSISTANT

Design Project

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DEVELOPMENT OF A RASPBERRY PI 2 -BASED REAL-TIME VIDEO PARKING ASSISTANT

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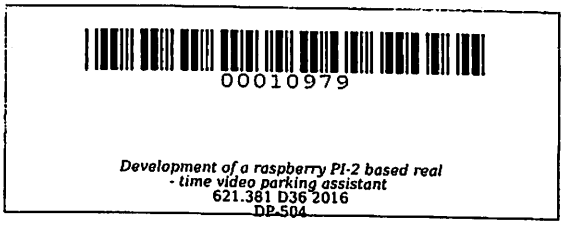
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Development of a raspberry PI-2 based real - time video parking assistant
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ABSTRACT

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The main objective of the study was to develop a microcomputer- based real-time video parking assistant. Specifically, it aimed to design and construct the parking assistant and monitoring system; develop a program for the microcomputer using Raspbian operating system; develop an Android application using Android Studio; access the system through the internet; test and evaluate the performance of the system through pilot testing, and; determine the cost of the developed system

The study has two (2) important ideas: video streaming via WLAN connection and providing means of security which monitors the parking slot through screenshots which are accessible via mobile internet. Both are done through the use of an Android application.

The design project was composed of a Wi-Fi Router, two IP cameras, and an SD card which was wirelessly connected to the Raspberry Pi 2, a microcomputer that serves as the control unit of the system; and a smartphone with android OS where an android application was installed to access the system.

The Parking System was installed and evaluated outside the Engineering Science Building of College of Engineering and Information Technology. The connectivity, streaming, and rate of video transfer of the Parking System were determined by test drives. The time difference of using the system was compared to another test of parking without the project.

The design project was presented to the research advisory committee composed of the proponents' design project adviser, technical critic and faculty members of the Department of Computer and Electronics Engineering (DCEE) for initial and final testing last March 2016 at the parking area of Engineering Science Building of College of Engineering and Information Technology. It was tested and several functions such as connectivity of router to device, rate of video transfer, sensitivity of motion detection, and image quality was evaluated.

Based on the data gathered, the responsiveness and data transfer of the Parking system was functional.

The initial and final evaluation of the design was conducted by 20 participants consisting of College of Engineering and Information Technology (CEIT) faculty members, student drivers and professional drivers. The evaluation was conducted at the ES Building on March 2016 to determine the functionality, reliability, consistency, accuracy, efficiency, and user interaction of the designed project. The time difference of using the system was compared to another test of parking without the project.

Results of the evaluation revealed that the Raspberry Pi 2 -Based Real-Time Video Parking Assistant has obtained all the objectives of the study. The experience of using the design project was comparably better than parking without the system.

The total cost of the design project was P 13, 298.00.

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INTRODUCTION

Parking Assistant technology assists drivers in parking their vehicle. A microcomputer is a complete computer on a smaller scale which contains a microprocessor, memory, and RAM, I/O ports, and a bus. Android Software will be used in providing access to the real-time video.

The instrument focuses on providing ease and convenience that can be used on parking on closed, and open parking areas. The system provides a real- time video through a microcomputer that will be transmitted through wireless fidelity, and internet on Android devices. From the android application, the user can be assisted on his parking activity by its real time streaming feature. The system also provides security which captures images whenever motion is detected and can be accessed through the android application's gallery.