

MECHATRONICS

BOOK SERIES

SYSTEM DESIGN AND SIGNAL PROCESSING

VOLUME 2

Editors

Md. Raisuddin Khan

Md. Mozasser Rahman

Muhammad Mahbubur Rashid

Shahrul Na'im Sidek



IIUM PRESS

INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

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Published by:
IIUM Press
International Islamic University Malaysia

First Edition, 2011
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Perpustakaan Negara Malaysia

Cataloguing-in-Publication Data

ISBN: 978-967-418-132-1

Member of Majlis Penerbitan Ilmiah Malaysia – MAPIM
(Malaysian Scholarly Publishing Council)

Printed by :
IIUM PRINTING SDN.BHD.
No. 1, Jalan Industri Batu Caves 1/3
Taman Perindustrian Batu Caves
Batu Caves Centre Point
68100 Batu Caves
Selangor Darul Ehsan
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CHAPTER 36

AUTOMATIC CAR PARKING MANAGEMENT SYSTEM FOR LARGE PARKING LOT

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36.1 Introduction

In general, parking lots consist of multiple lanes with rows of parking spaces between each one. The location of the parking spaces for each vehicle is usually indicated with pavement markings or lines similar to center lines on streets. A very common arrangement in large parking lots is angle parking for two rows of vehicles between driving lanes, with the parked vehicles facing front to front between the two rows. At the sides of the parking lot, other driving lanes connect these lanes perpendicularly so that a vehicle can drive into and out of the parking lot at designated locations. For this typical car parking system, drivers need to find empty spaces by examining each of the parking spaces [1]. Drivers always encounter difficulty in finding empty parking spaces while parking especially in a huge car park [2]. These delay in searching for empty parking spaces and slow vehicle retrieval results in car park congestion, poor car park utilization and delayed exit of vehicles. An automatic car parking guidance system has been developed in order to improve the effectiveness of conventional car parking system [3]. The system gives drivers current information on parking status within controlled region [5]. The system is a combination of traffic monitoring, communication, processing and variable-message sign technologies [6]. It is designed to assist drivers in searching for empty parking lots by directing them to the unoccupied lots. Besides, the numbers of unoccupied lots are also displayed at several strategic locations within the car parking area. The project to be undertaken is important because by having the automatic parking guidance system it will significantly improve the current parking system. This include optimal use of the parking area, reduction in congestion due to fewer cars driving around searching for spaces, reduction in time spent and fuel consumed while searching for available parking spaces and lastly reduction in illegally parked vehicles.

36.2 System Design

The system design covers the functional block diagram (Fig. 36.1 and Fig. 36.2), system components, and functional design whereas the software development stage involves the overall system integration of each component according to the sequence of the system operation.