

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
Tel: +603-6188 1542 / 44 / 45 Fax: +603-6188 1543
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CHAPTER 25

A CASE FOR COOPERATIVE VISION SYSTEM

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25.1 Introduction

Research on vision applications has received an increased attention from various sectors due to the availability of processing power that is not available before. It is known that vision as a sensor will be able to provide huge amount of useful information from the environment compared to other type of sensors [1, 2]. Vision based system can be made with the ability to adapt to the varying environmental condition since the visual sensor itself can give rich and comprehensive information about the condition of situation.

Object recognition and the subsequent target detection are the fundamental technologies in the development of real-world computer vision system. A combination of these development and agent technology have given rise to distributed vision system such as vehicle monitoring [6], and video surveillance [3].

In this chapter the primary interest in this area lies in the dynamic interaction of individual computer vision system to perform a complex task. Agent based system set-up was characterized by being able to exist either independently or cooperate with other system within modular manner in real time setup [5].

The technique was comprised of vision for estimating variable situation in the environment. More precisely, the system consists of more than one vision system that links to each other in order to achieve the ultimate goal. The action of the vision agents will respond based on the information given agents connected to it. Thus, the system consists of independent cooperative agents with protocols for cooperative data enlargement. Under this architecture the agents cooperatively track their target objects by dynamically exchanging object information with each other. The communications between agents are implemented by the usage of shared information about the anomalous region in a central location. The system enables the agents to be aware of the current perspective of each agent state and its intending target location. With this cooperative model the system as a whole can track multiple objects in the area covered by the vision system.

Vision system was proposed in this study to recognize the situation thus every agent could cooperatively process the situation based on user requirement. The image processing part has been divided into three stages; object detection, object recognition and object measurement. This separation is important to setup different mechanical reaction for each different stage. Therefore it will be prepared for any condition changing from early phase. The objective of this study to propose new approach of vision system