INTELLIGENT VISION SYSTEM FOR DYNAMIC ENVIRONMENTS

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Abstract

This dissertation describes an intelligent vision system that absorbs useful information from its environment and draws useful conclusions. This system can give the instructions to locate vacant seats that are currently occupying in a cinema theater. Extraction of useful information without viewing or exposing inside details of an environment through an active vision system is proposed. Reasoning based conclusions are drawn for optimum searching. The effectiveness of the proposed method is demonstrated using an experiment.

Three reasoning criteria are developed and experimentally tested for identifying the states of seats, States of seat can be vacant state, occupied state, or a state with an object placed on the seat. First criterion basically uses binary image analysis and with the introduction of white reference value it can also be applied for environments where there are intermittent variations of illumination level. Second criterion is based on the analysis of color image and it can be basically used for identifying objects placed on seats. Third criterion based on the analysis of intensity image.

Intelligent vision system was developed using the combination of first and second criteria. The created graphical user interface provides links for setting up the system, and setup program i provides an interface and instructions for user to find seat locations and entering those locations in the main program and other setup programs. Setup program 2 is given for automatically calculating the other necessary parameters and white reference program for setting up white reference values.

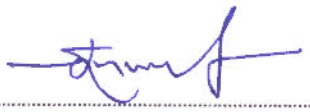
The intelligent vision system can be further developed and generalized for other applications.Mainly it can be used for intelligent building applications. For example in designing an intelligent room where the movements and changes occurring inside the room could be monitored using a camera system. In a multi storey building, required information of a particular floor that is used for common seating could be displayed at other floors. In a vehicle park, the registration number and the entering

time of the vehicles could be recorded. Available parking spaces can be displayed at the entrance.

DECLARATION

The work submitted in this dissertation is the result of my own investigation, except where otherwise stated.

It has not already been accepted for any degree, and is also not being concurrently submitted for any other degree.



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July 20, 2005

I endorse the declaration by the candidate.

UOM Verified Signature

Dr. Lanka Udawatta

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LIST OF FIGURES

LIST OF TABLES

CONTENTS