AUTONOMOUS NAVIGATION MOBILE ROBOT
Lee Kam Sing, Lui Chap For, Wong Ming Sing
Advised by
Prof Li, Zexiang

OVERVIEW AND OBJECTIVE

With the help of the new technology the experiments, most successful and high level designs have been accomplished. The autonomous robot has cut delivery costs between labs in the Hong Kong University of Science and Technology.

Main Focus:
- POWER ELECTRONICS
- CAMERA PROCESSING
- IMAGE PROCESSING
- MOTION CONTROL

POWER ELECTRONICS

New Motor system has been designed with the embedded computer to power the Embedded Motion Control and Investment in High Power motors.

The newly designed Motor Driver also adopted some techniques and motor drivers. This system has a double controller design. An optimisation function has been implemented in the project.

CAMERA PROCESSING

Laser sensors have been adopted into the project. Two types of design have been embedded into the robot.

- Laser Camera System
- Stereo Camera

IMAGE PROCESSING

The robot has also embedded with image processing function. Face Recognition has been implemented in order to make sure the robot has directed the guest to the right person in the right level.

MOTION CONTROL

With the help of the laser scanner and the laser camera system, calculation algorithms have been implemented in order to achieve calculated depth and directions to the obstacles.

Conclusion:

All video system was implemented but to perform was not as good as expected. It may be because the movement system is quite complex. Improving in performance could be achieved if a powerful computing system was adopted. The robot's performance can be improved and overall expense. A face recognition system was developed and is successfully track a database of human faces and recognised every face present in the database. The robot also integrated thermography and was able to navigate while observing avoiding new obstacles.