

MINIMAL GRASPER

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Abstract— A flexible enveloping grasper is proposed for pick and place task with low manipulation and task planning complexity for practical applications .The proposed grasper has two main characteristics self adaptively and flexibility These two properties helps the grasper to minimize internal forces and to achieve successful force distribution.

Keywords—Self adaptivity , flexibility

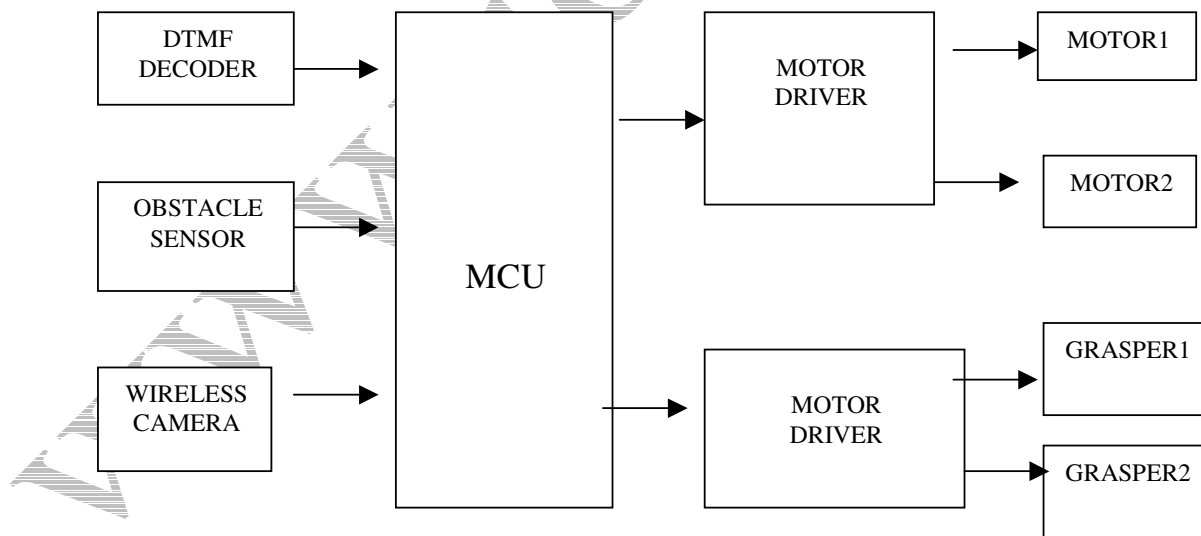
I. INTRODUCTION

The proposed grasper can grip an object in a self adaptive way such that various process complexities are significantly reduced. By using flexible material a stable grip can be implemented to cause increase friction between the grasper and the target object as a result of increased contact area.

II. LITERATURE SURVEY

Lots of research has been going on the field of Development of Robotic hand. In "Simple, Robust Autonomous grasping in unstructured Environment, they have adopted a four fingered hand is driven by a single actuator, yet can grasp object spanning a wide range of size, shape and mass.

III. BLOCK DIAGRAM



A. DTMF Decoder

When DTMF data received by a DTMF decoder , it decodes it in to 4 bit binary form and given to micro controller.

B. Obstacle sensor

Obstacle sensor is used to detect the presence of object in front of the grasper. And it uses an infrared LED and photo diode to detect the presence of object and the distance between the grasper and the object.

C. MCU

Here mainly PIC 16F886 is used. It is a risc architecture processor. It receives data from DTMF decoder and according to the decode data received the micro controller will process the data. The output from the micro controller is given to motor driver. The output of the obstacle sensor is also given to the MCU.

D. MOTOR DRIVER

There are two motor driver is used. One for driving the movement of robot and the other for grasper.

E. Grasper

It grasp the object when obstacle sensor detect an object

IV WORKING

When the input DTMF data received by DTMF decoder, it decode the input data in to 4 bit binary form and given to micro controller .And micro controller processes the data and it drive the motor of robot. It will produce the robotic movement. Initially robot rotate in five degree right and searching for object and after a time delay it rotate again five degree right .This process is repeated until it detect the object. the image of object will get using a wireless camera, then robot moves in forward direction. Using obstacle sensor it detect the object when it reaches near the object. Obstacle sensor gives its output to MCU , then MCU control the grasper movement to grasp the object. We can also control the grasper movement manually .Using a tactile sensor switch we can identify when the grasper grasp the object.

V. FUTURE WORK

The system can be enhanced by including by adding 3 camera for obtaining 3-d position of the object by using image processing.

VI. CONCLUSION

It is mainly designed to reduce the mechanical complexity of robotic hand. Due to self adaptively and flexibility of the grasper it is useful for pick and place task.

Acknowledgment

I would like to thank our Principal Dr Masud Hossain, Head of Department prof. Jacob Zachariah ,our project coordinator Asst. prof Sreedha sreedhar, my guide Asst prof .Shilpa .Harikumar for their valuable advice and technical assistance.

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