

ABSTRACT

Nowadays, the development of sensor technology growing rapidly and has lead to the methods of the various sensors application. Vision sensor is something that is used to detect the object around the system. We can determine the condition of the object by using ultrasonic sensor. Vision sensor with the ultrasonic is much used in our daily life as determining the depth of the sea, USG process, avoidance-obstacle robot, etc. the benefit of using ultrasonic is

The application of array in ultrasonic sensor by designing and creating realization. The ultrasonic sensor module has an ultrasonic sensor and supporting series as the main component. This system can be used by setting only one transmitter and some receivers. By doing this step, the interference from the other transmitters can be reduced as it only uses one transmitter, so each sensor can accept the real wave of reflecting sound. In addition, there is no interference while using a lot of transmitters. In this system, the manufacturing process is created by designing the transmitter and receiver circuits. Then, the circuits are connected with the micro controller Atmega 32 which has 8 receivers and 1 transmitter that spinned by the motor stepper, so it can send the ultrasonic sound to the all receiver circuits.

After implemented hardware and software. The result is, memory used by the ATmega32 is 76.4%. The sensor accuracy up to 96.43% and precision (standard deviation) ± 0.55 cm. In determining the position, accuracy of the system reached 88.64% with precision (standard deviation) $\pm 3.5^\circ$. And the maximum range of the system is 65 cm.

Keyword: Vision sensor, ultrasonic, uniform circular array