Abstract

Mohamed Saad Zaghloul

R13, Modern CAD Technique to Design Gyrocompass for UAVs and Robot, Ships,

This paper concerns the practical design and implementation of gyrocompass required for operation of all installed navigation equipments on robot, aircrafts, ships, also for UAVs. Most navigation systems today use some type of compass to determine heading direction. Using the Earth Õs magnetic field, electronic compasses based on magnetoresistive (MR) sensors can electrically resolve better than 0.1 degree rotation and accuracy from 1 to 2 degree. Most of installed equipment on aircrafts, ships, and spaceship are form of computer?based navigation information system that complies with International regulations. These equipments can be Global position System (GPS), Radar, speed, direction, electronic chart display, height finder for aircrafts and spaceship, echo sounder for ships etc. In our design, Compass Module was utilized with Honeywell?s HMC5883L 3?Axis Magnetometer, I2C, 2.7?6.5V, TTL?USB and microcontroller 16F877. For programming of the microcontroller, software PIC Basic pro was used, a window based Software. We are trying to use a cheap and good resolution within a small size Using Anisotropic Magneto resistive (AMR) technology that provides advantages over other magnetic sensor technologies. These anisotropic, directional sensors feature precision in?axis sensitivity and linearity. These sensors' solid?state construction with very low cross?axis sensitivity is designed to measure both the direction and the magnitude of Earth's magnetic fields, from milli?gauss to 8 gauss. The complete designed system has three outputs, the first one is USB port friendly user interface, the other two outputs are control logic state outputs. We used the designed gyro output to interface with Radar display so the targets direction can be measured in true mode instead of relative mode as well, our designed module was employed in car protection in driver safety.