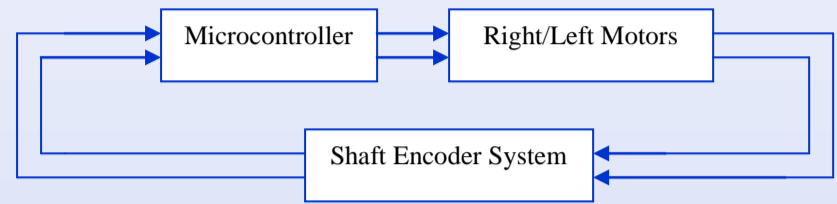


MineTracer System

Senior Design Project
Electrical Engineering
School of Engineering
American University in Dubai

The Senior Design that Can Save Lives



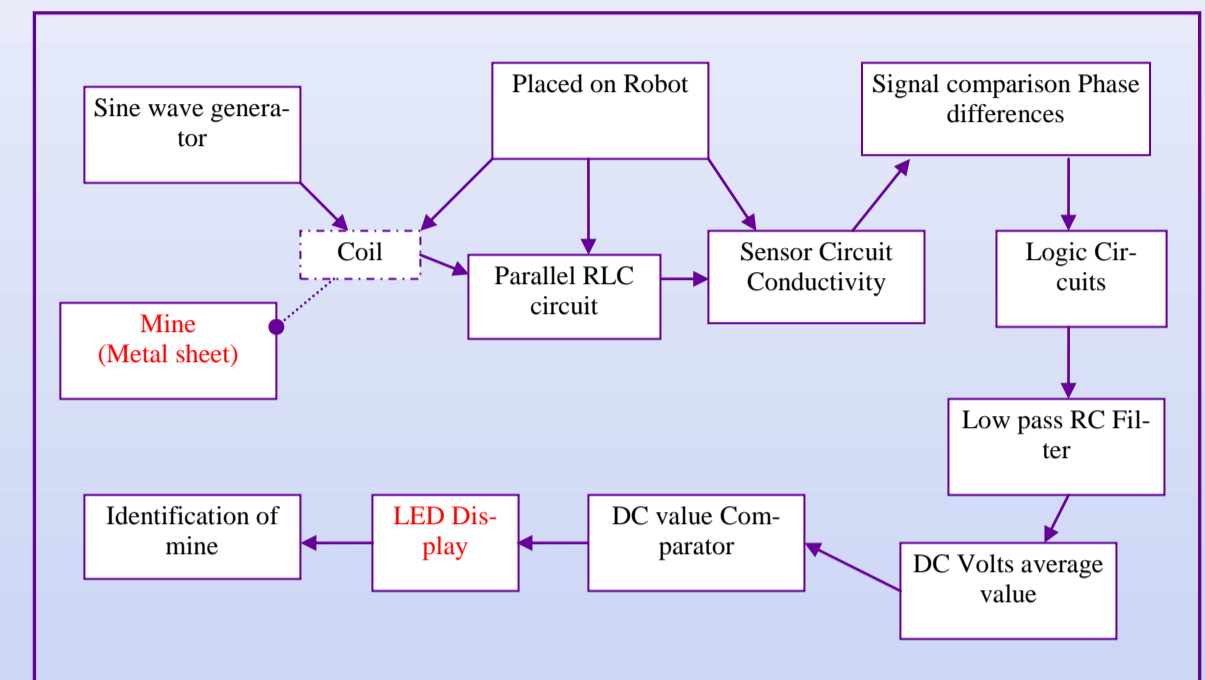
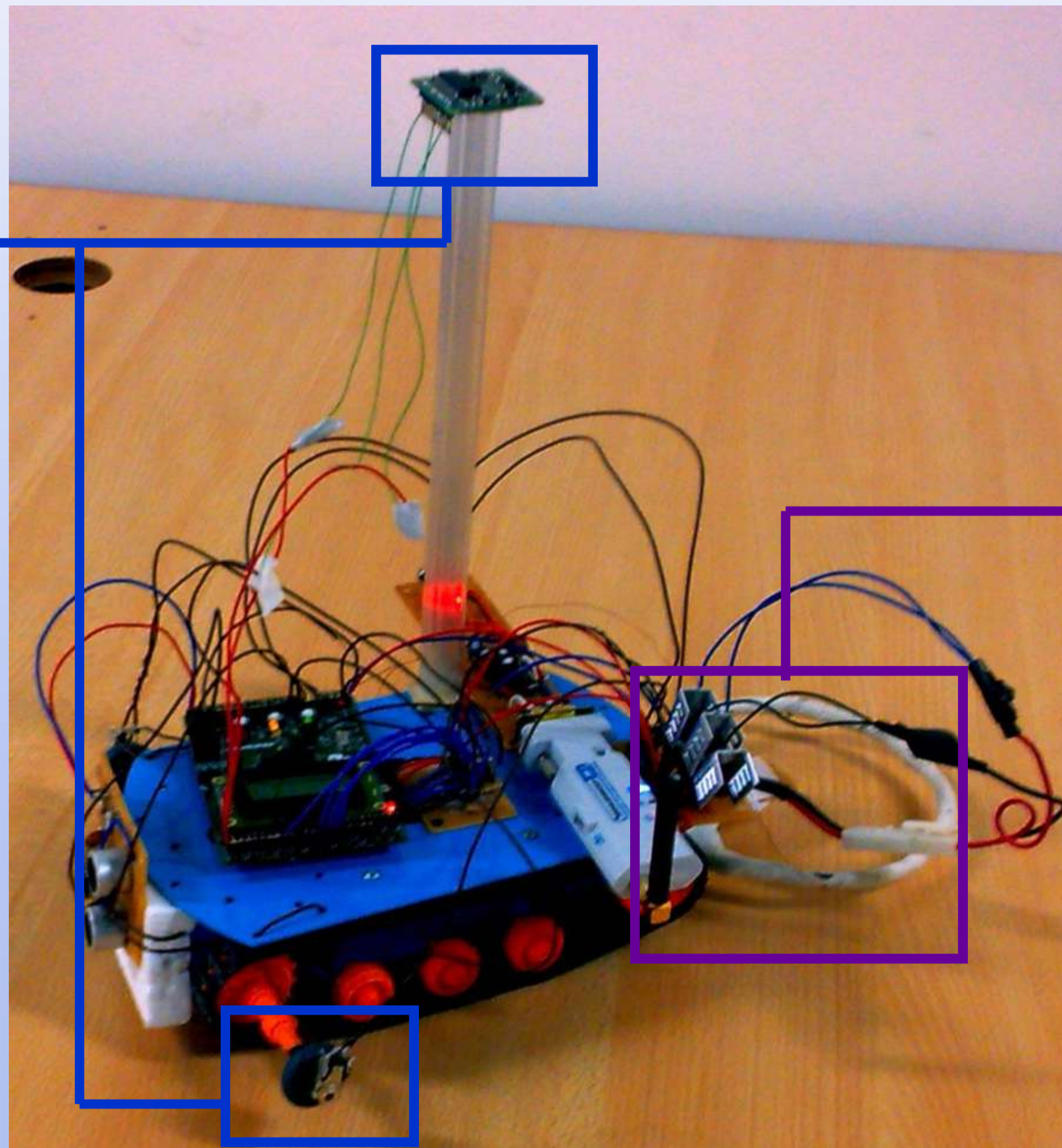
Drive and Control

Straight Line Rotation

Shaft counts reflect wheel motion. The number of counts provide a measure of distance traveled.

Difference between right and left wheels is recorded periodically. Adjustments to power supplied to motors are made accordingly.

Digital Compass provides the heading of the robot in degrees. The rotation can be made by specifying the target angle to rotate to.

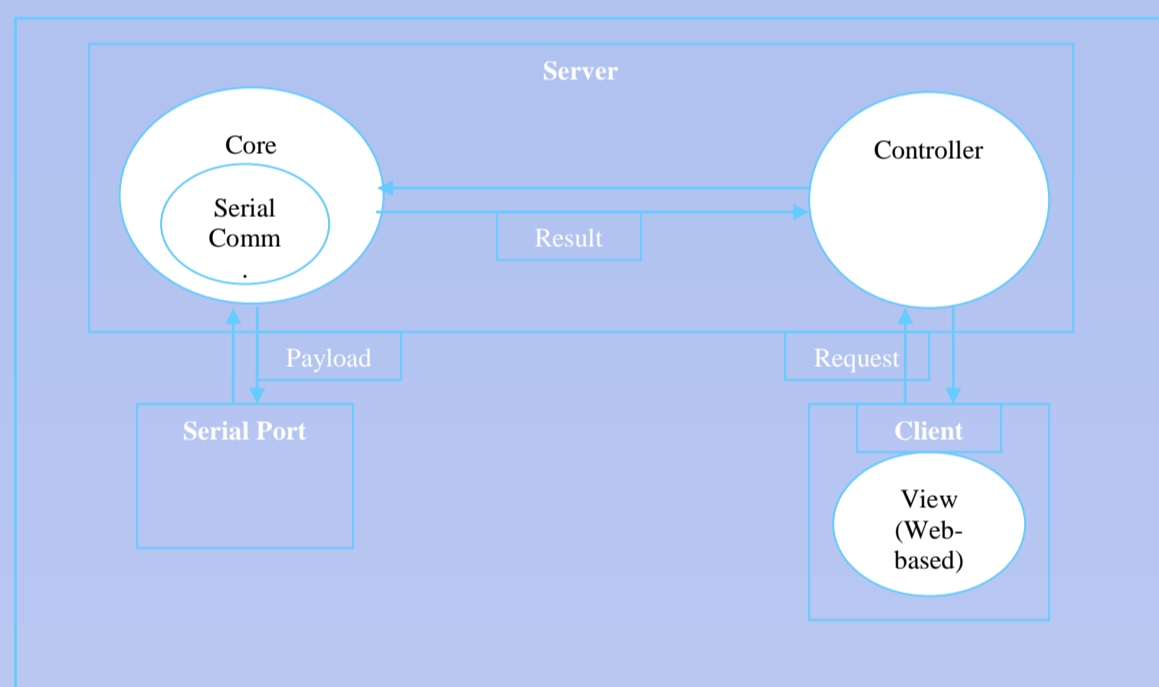


Electromagnetic Mine Sensor

Inductor in RLC circuit is large coil.

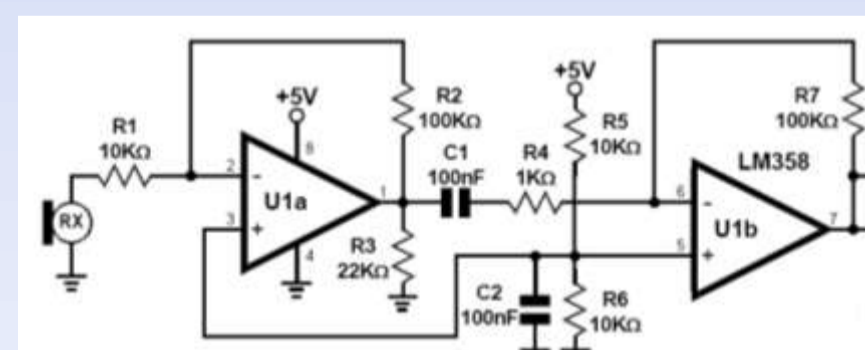
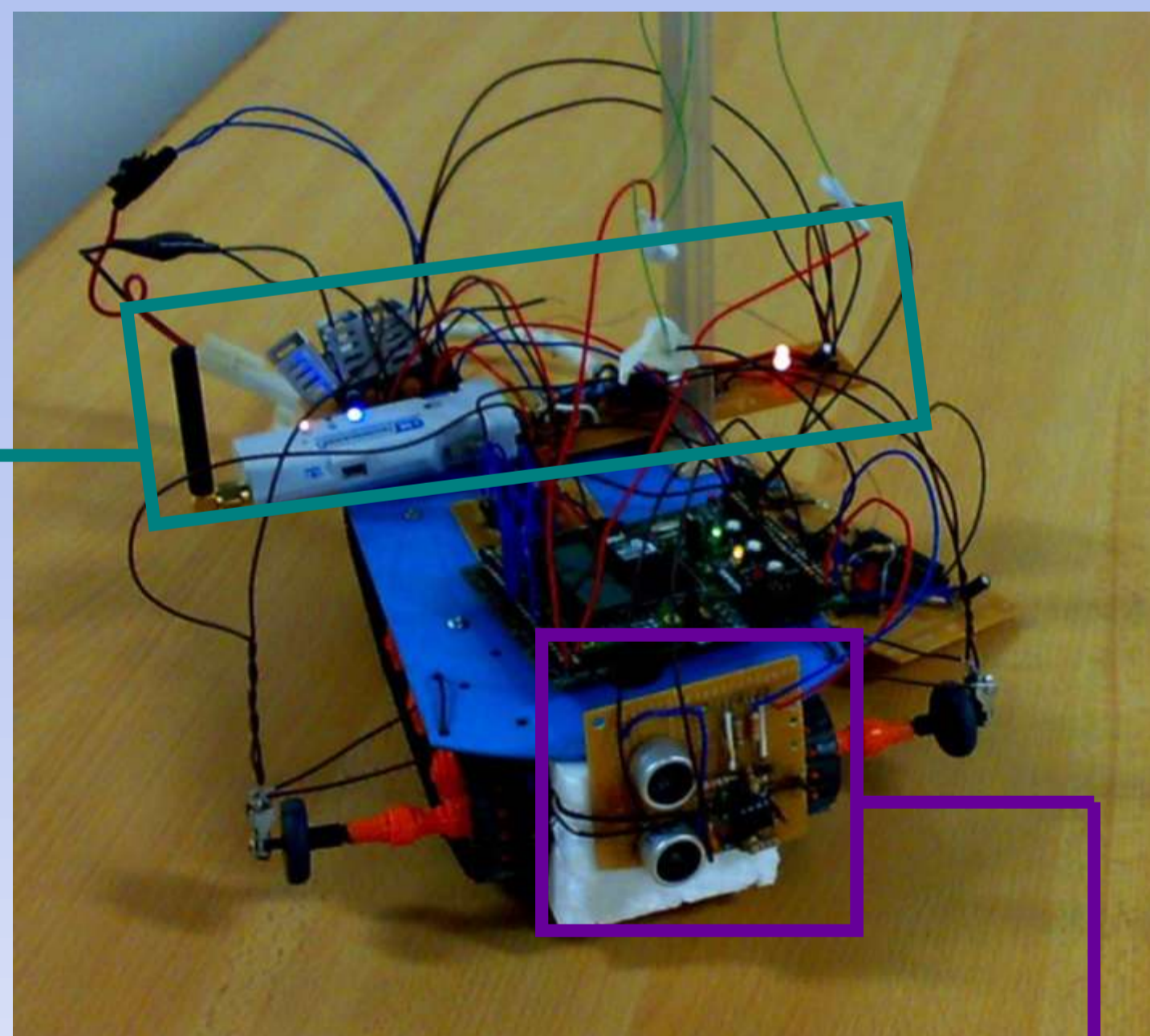
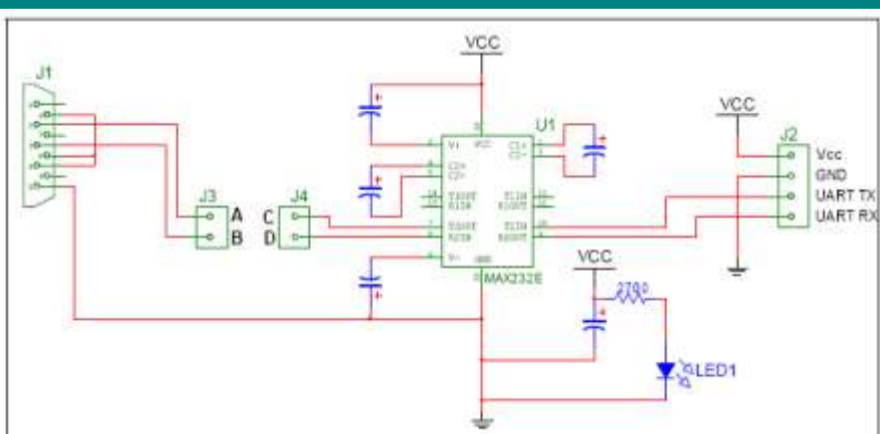
Any metals in close proximity to coil create electromagnetic interference that registers as a phase shift in RLC circuit.

If there is a phase shift, MCU is alerted.



Wireless Base Station

MCU to Base Station Wireless Serial Communication



MCU used to emit ultrasonic sound wave from sonar transmitter.

Sound wave reflects off of obstacle and is detected by sonar receiver.

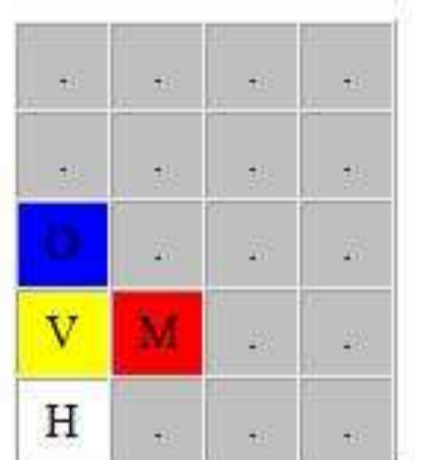
Received signal amplified and processed to find peak.

Time difference between peak detection and pulse transmission used to determine if obstacle in next cell.

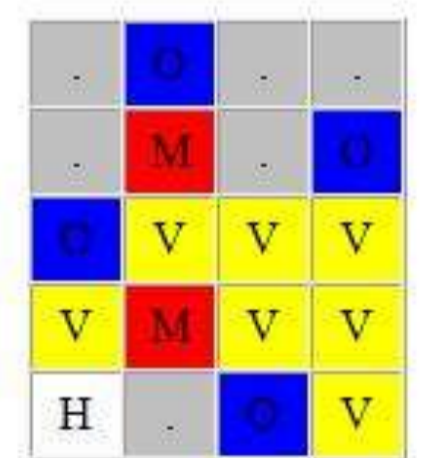
Ultrasonic Obstacle Detection

Grid Scan

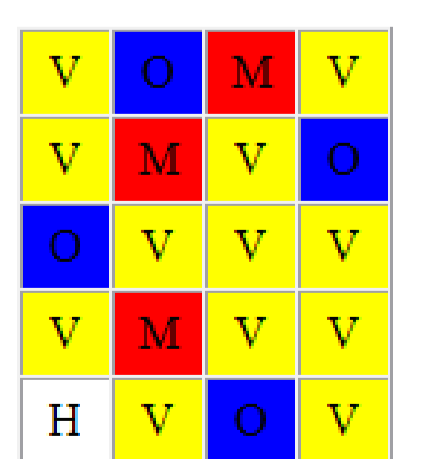
Grid Map



Grid Map



Grid Map



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