### Statement of work

Design an embedded system that will include:

- Four ultrasonic range finders – assume these have 10m range
- One 3-axis accelerometer
- Two DC motors
- One radio transceiver

Design an autonomous vehicle that can enter a room through a doorway, map the contents of the room in all three dimensions, transmit this information to a second identical robot just outside the room, and then leave the room. The vehicle should map all contents of the room, up to 8 feet high.

### Capabilities

1. The vehicle may need to travel inside of to room to see items hidden behind larger items or to observe.
2. The vehicle will always be able to find its way out of the room.
3. The vehicle will be able to turn in place.
4. The vehicle is self powered (battery) with the aim of keeping the weight minimum.
5. You must mount the ultrasonic sensors on a pole 1.5 meters high.
6. You must include a watch dog timer function.
7. You must include an operating system.

### Test Questions

1. Create a block diagram of the electronics of the proposed vehicle. Include enough detail on each components and number of wires between each subsystem.
2. Write the software architecture of your system.
3. Write the algorithm for the mapping subroutine.