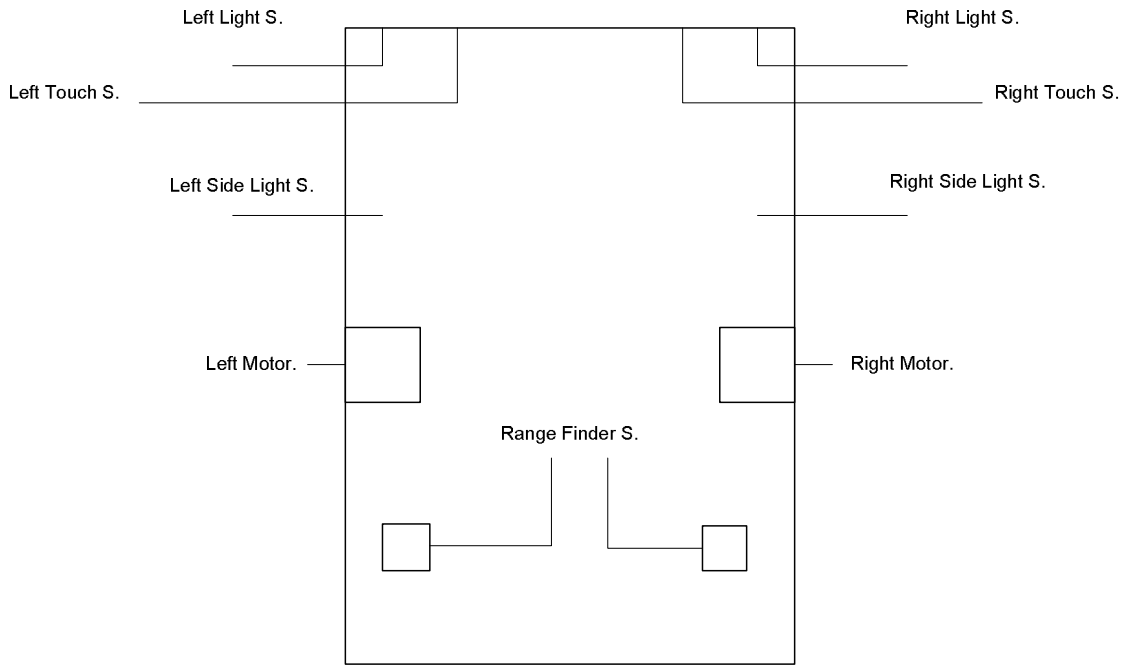
AI ROBOTIC.

Project N. 2.

ROBOT DESIGN

In order to accomplish the robot tasks we design a four wheel car robot with two independent motors, one in each one of the front wheel. The robot has two touch sensors in the front part, that are used to sense the hit with a rock or whatever obstacle different of the hazards objects. To find the goal, the light bulb, the robot has 4 light sensors that are located in the same placeholder of the range finder: two are located in the front and the other two to each side. To avoid the hazards obstacles the robot has two rangefinder that are located 4 inches back front the front, just above the high of the light bulb. The following diagram shows the design:



Robot Design Diagram.

Motors: We choose two independent motors for simplicity in the design of the gears, three were used in each side, and to accomplish to go straightforward, backward, and turn in whatever direction.

Touch Sensors: In order to know that the robot has hit a non hazard object we used two front touch sensors. If the robot hit something of a high less than two fits, it knows that,

then it goes back and turn in the opposite direction of the touching. If it touches an obstacle in the front, a random turn is used.

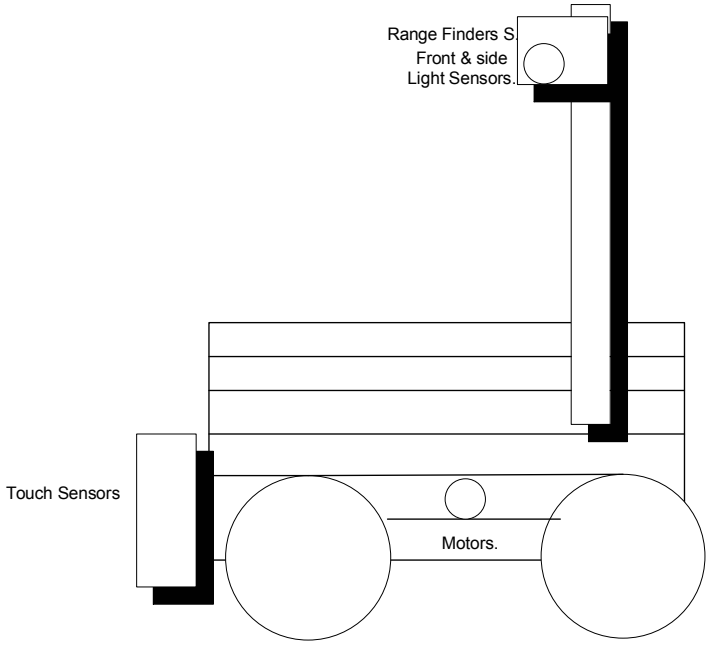
Light Sensors. At first it seems that two light sensors are enough, but no. in the test part, we got the same values in the two front sensors when the robot was not well aligned. That means that the robot could believe that it is in the correct direction, but what happens is that the robot missed the target. For that reason we put two more light sensors: one in each side. If the two front sensors are given the same value or values that are quite near, the side sensor that are near the light is going to give the difference. However, if the values of the front sensors are quite equals and the side sensors are quite equal too, that means that the target light is in front. In resume, we used four light sensors.

Range finders. We are using two. They are located at a high more than the rocks and the light bulb, and of course, less that the hazards objects. The range finder must be located at a minimum distance of 4 inches. If the object is between the 4 inches it is going to appear far away. For that reason the range finder are in the back part of the robot, guarantying the minimum distance to sense well the hazards objects.

Various designs. Well, to say the truth, the final design was not the first. At the beginning we planned a tank robot with 2 motors, 4 touch sensors, two light sensors and two range finders.

When we tested the robot we had problem with the gears and with the weight of the handy board. The left gear began to slip because of the back weight that the robot had with the handy board on it. So the team decided to design the robot with less gears and as a robot car.

In another test session we find the problem with the light sensors: two were not enough, this was described above.



Side View of the Robot.