PYRO SYSTEM

*OBJECTIVE
-Teach the other stuednts how to use Pyro.
-Design and perform the swarm simulation
-Dissect one of the robot interfaces in PYRO and use as a model for the modified Roomba.
-Establish the Virtual Roomba Simulation System

*METHODOLOGY
-Simulator / World
Represents the environment in which the robot exists
-Robot
Represents the robot itself
-Brain
The logic which controls the actions of the robot
Each of these elements is interchangeable with the others

*SIMULATORS
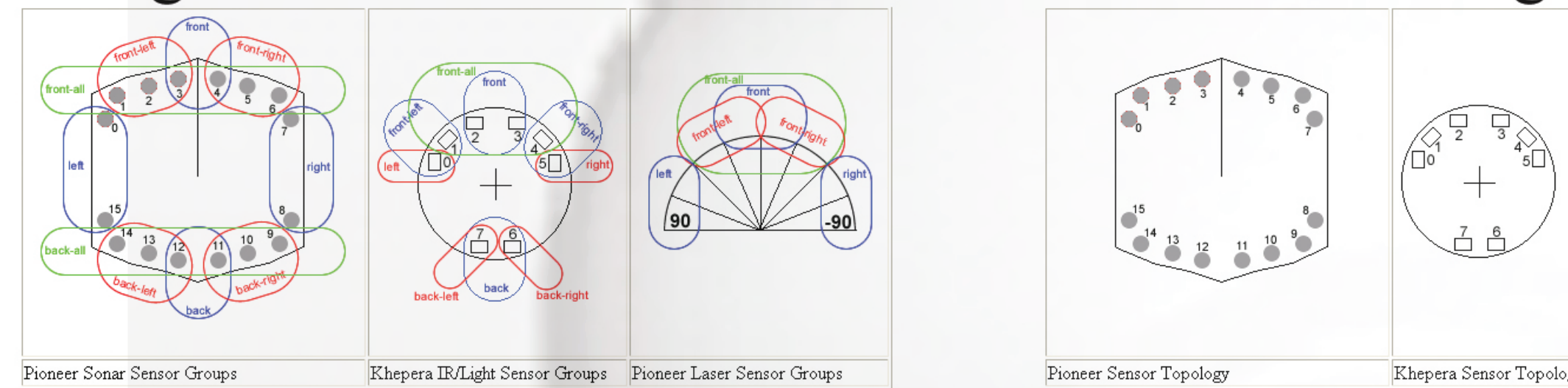
-Khepera
Hockey puck-sized with infra-red sensors

-Player / Stage
Open source
robot driver toolkit
Multiple robot simulator

*SENSORS

For convenience in programming, each robot class also defines named sensor groups for all of the basic sensors available on the robot.
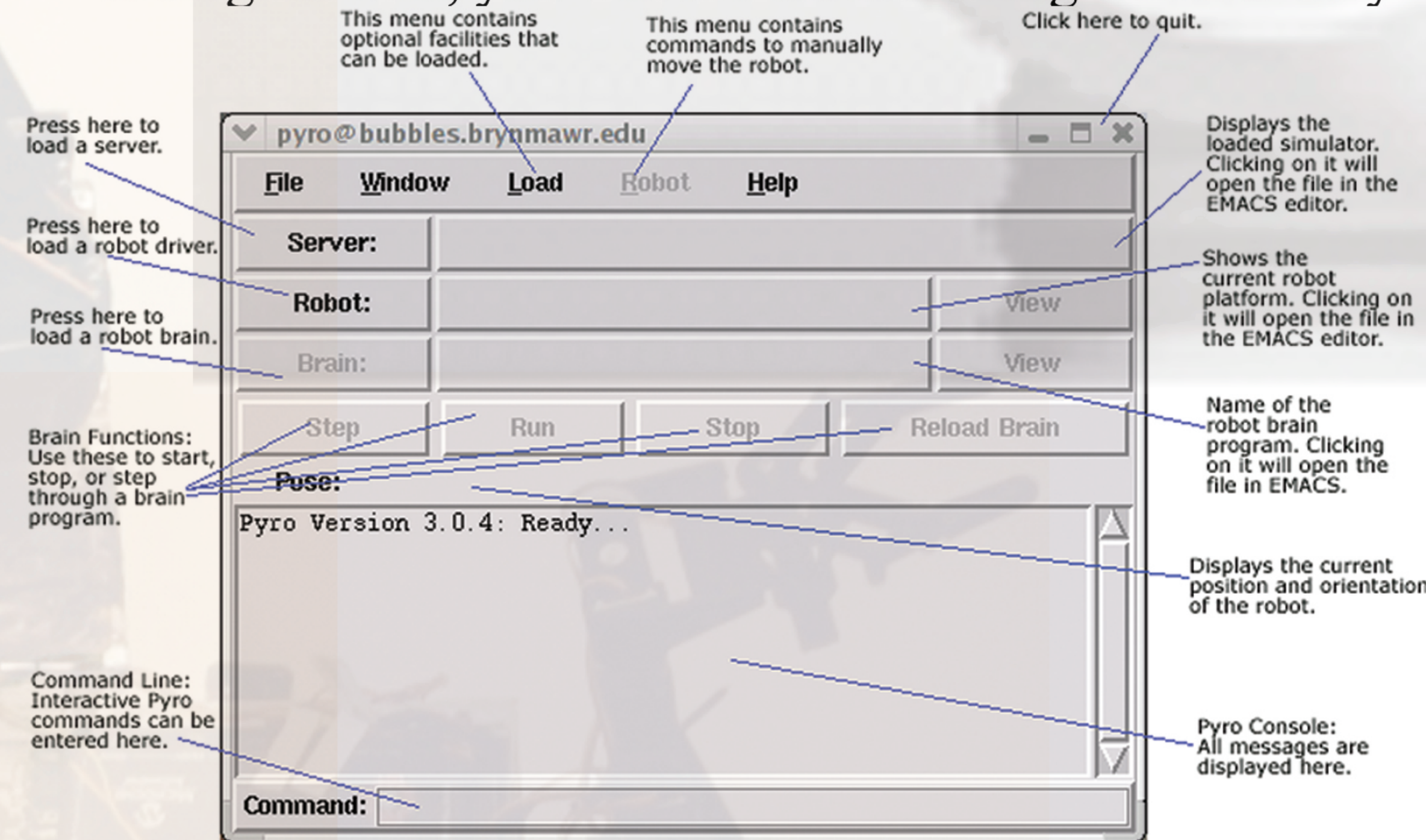The diagram below shows the locations of these sensor groups on a robot body.

*THE PYRO INTERFACE & VIRTUAL SIMULATION
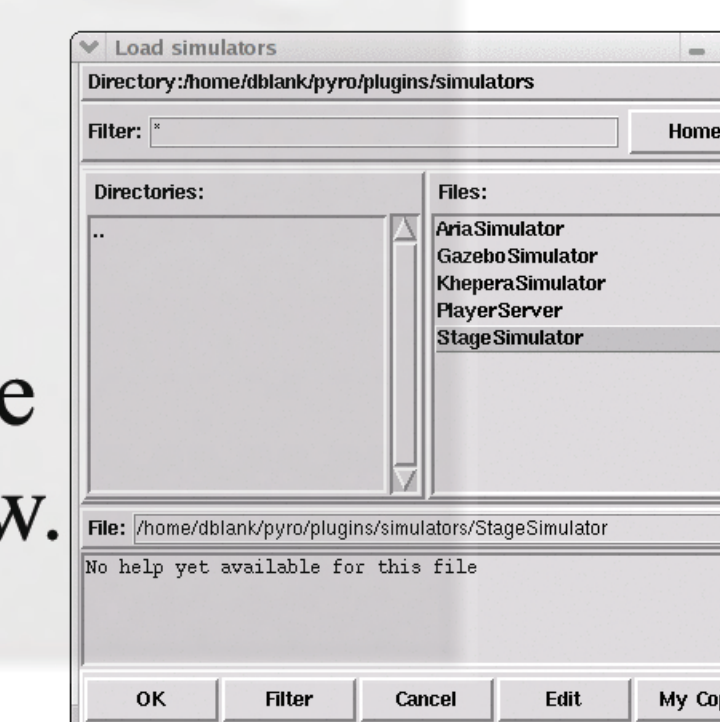Pyro can be used to experiment with simulated as well as real robots.

1. Starting Pyro
If your installation is set up properly, all you have to do is enter the command in a terminal window: $ pyro

If all goes well, you will see the following window on your desktop

This menu contains optional facilities that can be loaded.
This menu contains commands to manually move the robot.
Click here to quit.

Press here to load a server.
Press here to load a robot driver.
Press here to load a robot brain.
Brain Functions: Use these to start, stop, or step through a brain program.
Command Line: Interactive Pyro commands can be entered here.

Displays the loaded simulator. Clicking on it will open the file in the EMACS editor.
Shows the current robot platform. Clicking on it will open the file in the EMACS editor.
Name of the robot brain program. Clicking on it will open the file in EMACS.
Displays the current position and orientation of the robot.
Pyro Console: All messages are displayed here.

Pyro Version 3.0.4: Ready...

2. Specifying a Simulator
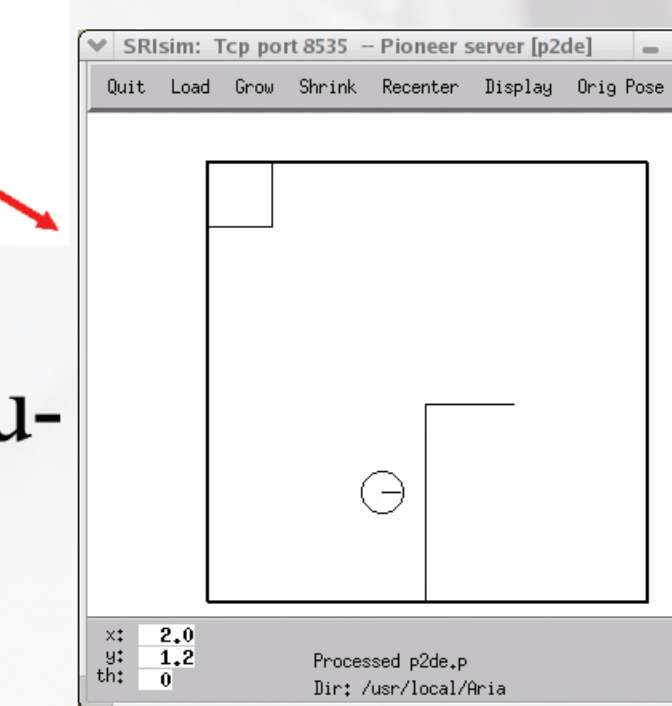To load a simulator, just press the Server button in the Pyro window.

3. Loading the Aria Simulator
Select the Aria Simulator. The simulators allow you to specify any world in which you would like to run your simulated robot.
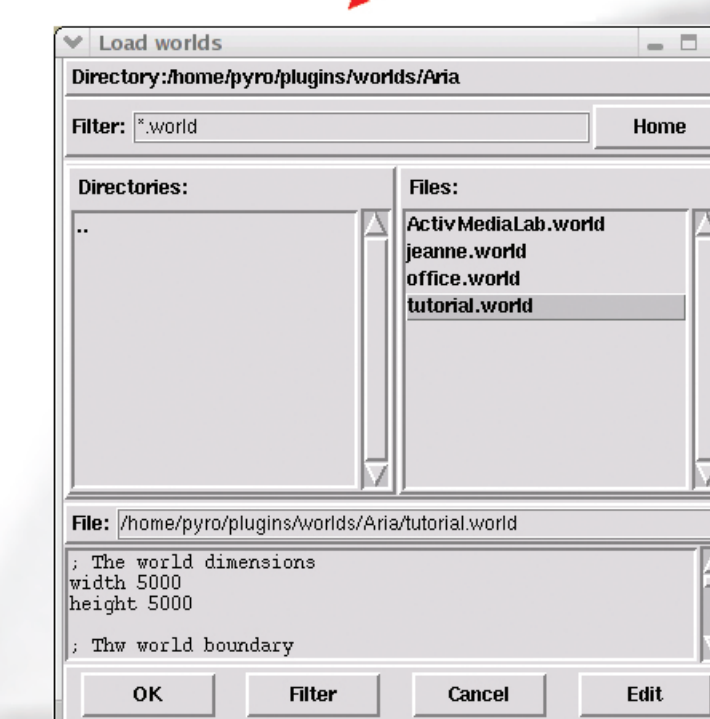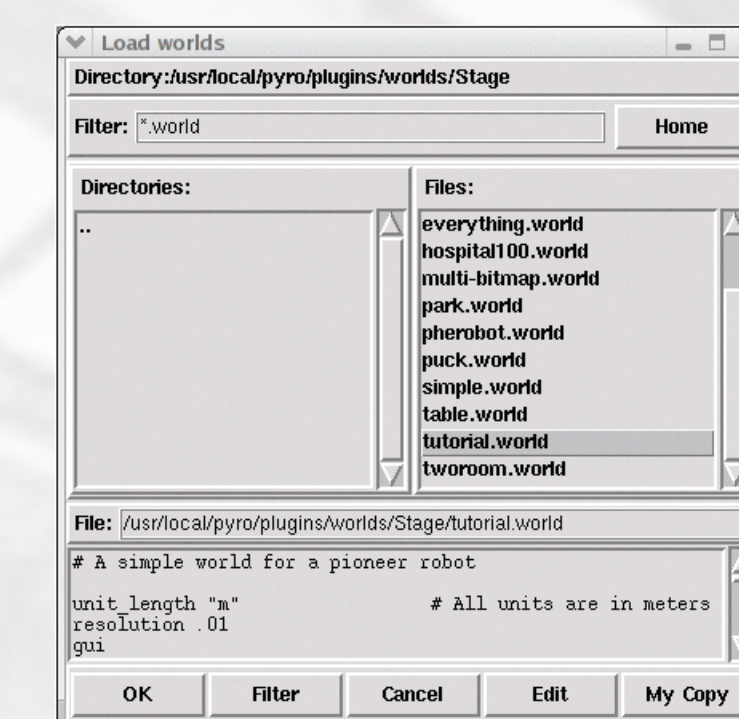
4. you can choose tutorial.world
and press the OK button. The simulator will start

5. Loading the Stage Simulator
Next, we will follow the same steps to show you how to load the Stage simulator and a Stage world. If you are following from the previous section, you can close the SRIsim window. Using the Server button, go ahead and load the Stage simulator.

6. Virtual Robots Simulation
You will then see the following Stage window.

Maze Simulation
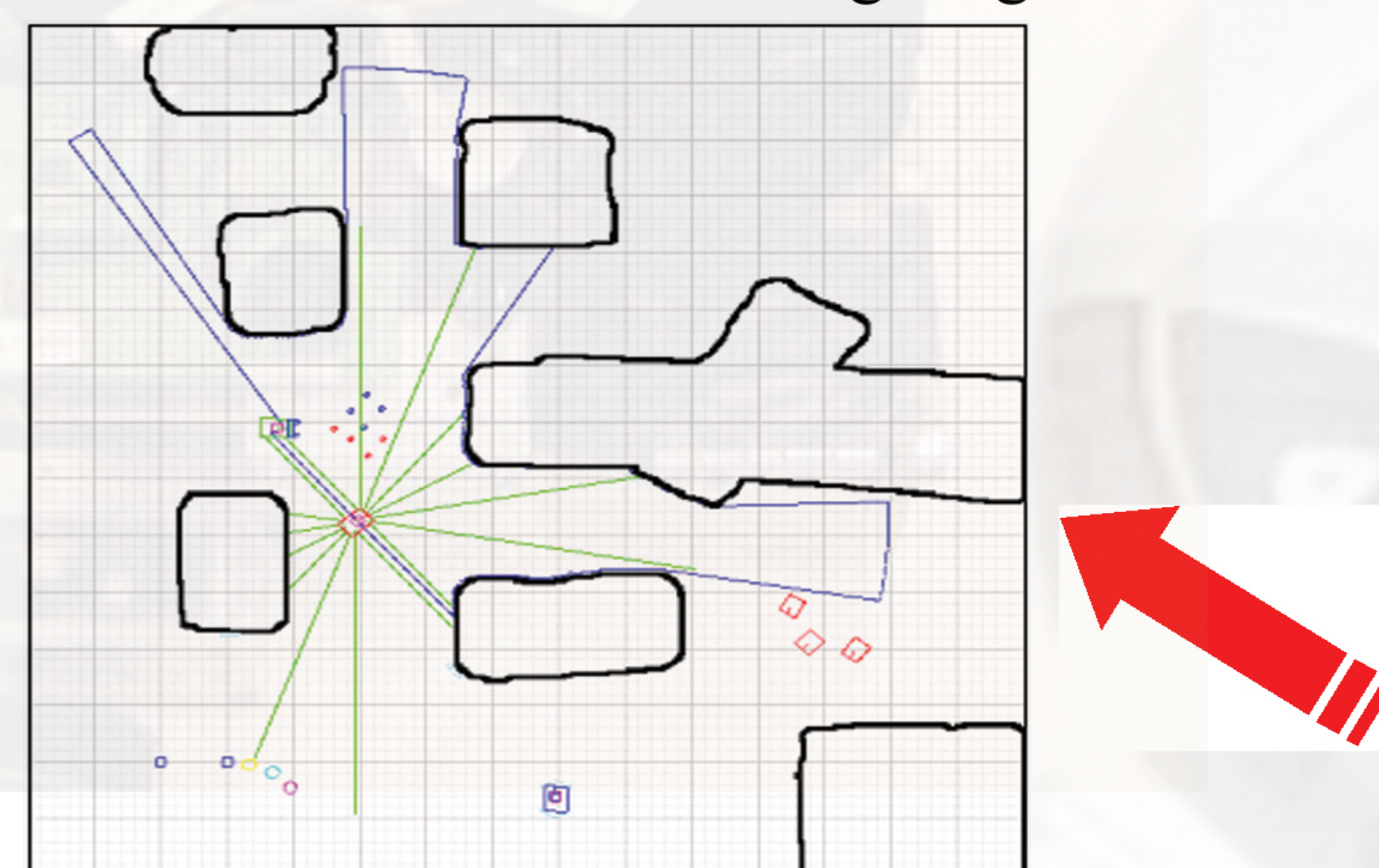
DARPA & GIS

*OBJECTIVE
-Create a "mini" version of the actual challenge, organized by The Defense Advanced Research Projects Agency (DARPA), at IIT.
-The integration of a GPS package that could be used as a navigational tool for the competitors.
-Geographic Information Systems (GIS) in order to obtain digital satellite pictures of the school.
-Invite several other organizations (internal/external) to participate in this challenge in order to reuse their robotic creations.

*CONCLUSION
-SUCCESSFUL SIMULATION OF VIRTUAL ROBOTS
-PROVIDING A STEPPING STONE FOR THE ROBOTIC SIMULATION AT IIT
-PROVIFING EFFECTIVE DARPA MINI CHALANGE TO THE FUTURE IPRO 316

*FUTURE WORKS
-NEURAL NETWORKS

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