

91.549, Robotics II  
Fall 2003  
Prof. Yanco

### Some Ideas for Final Projects

Here are some thoughts for final project topics. Some have come from Doug (I asked him what he'd like to see done with the system). You do not need to choose something off this list – you can come up with your own project idea. We had a great range of projects for the vision project; I'd like to see us come up with a similar range for the final project.

By next Thursday, 20 November, you should have discussed your topic idea with me in person or over e-mail. You should start working on your project quickly – it is due on the last day of our class, 11 December, which is four weeks from today. There will be presentations and a paper due, just as with the vision project.

- 1. Mapping and localization:** There's been a start of a mapping interface, but no working mapping code has been written. There is open source code in Aria and in Player/Stage that could be used – many good algorithms there. For one person, just generating a map would be enough. For two people, add localization.
- 2. Voice recognition/generation:** SPHINX from CMU and Festival from the Univ. of Edinburgh allow voice recognition and generation, respectively. These are both open source and could be implemented in Pyro. Would need to create some interesting demo – perhaps a tour guide in conjunction with a group doing mapping and localization.
- 3. Multi-agent communication:** Write TCP/IP protocols to allow the Pioneers to broadcast and receive messages. Messages should be tagged with the id of the sender and the id(s) of the intended recipient(s). Intended recipients could also be flagged as “all” or the like. Would need to create an interesting demo as well. With two people, could implement some multi-agent behaviors such as those from Maja Mataric's work (gathering, flocking, etc).
- 4. 3D Simulator/Pyro 3.0:** There is a new 3D simulator from the Player/Stage people called Gazebo. It requires a new interface between Pyro and Player. But, the image from the 3D simulator would make a really cool simulated camera. See <http://emergent.brynmawr.edu/wiki/index.cgi/PyroGazebo> for some notes.
- 5. More vision:** Now that you've completed the vision project, you may have ideas for even more extensions to the system. Propose them.
- 6. More neural nets:** Use neural networks to learn from the camera image. Or use them to learn a more complicated behavior than wall following.
- 7. Your own idea here.**