Autonomous Mobile Robot Surveyor

The Beginning of an Odyssey

Diana Goluch
Stuart Matthews
David Van Fleteren
Eric Bango
Doug Barth

Andrei Boitor
Francisco Cardenas
Jason Kozmic
Steven Wolak
Rajat Bijur

Goals

- Build a mobile robot with a server interface
- Create a communication system for multiple robots
- Give robots the ability to self-navigate
- Make the robot as small as possible

History

- New IPRO - no previous work
- Explored other robots before beginning our design

Team Organization

Robot Construction

Controller | **Sensor** | **Motor**

Work plan – Controller

- Chose controller board based on
  - Size
  - Speed
  - Memory
- Created user interface for control server
- Established a communication protocol

Work plan – Sensor

- Examined available sensors
- Chose sensors
  - Infrared: short range
  - Sonar: long range
  - Shaft encoder: wheel speed
  - Microswitch: physical contact
- Interface between sensors and controller

Work plan – Motor

- Examined possible motors
- Chose 12 volt DC motor
  - Efficient
  - More reliable
- Created the layout and design of the robot
- Built the actual robot

Issues

- Unclear goal initially
- Limited resources
- Low level programming style for controller
- No lab access

Conclusions

- More complex than initially perceived
- Communication is key
- Requires a large range of skills

Next Steps

- Refine robot design
  - Smaller
  - Increase power efficiency
  - Add more sensors
- Create a system for handling multiple robots
- Include a camera
- Find better motors: torque/speed ratio