iRobot Create Navigation with Mapping Interpretation Explored Through Smart Camera Networks

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Discuss the idea for project.
Define odometry & localization?
Why this particular robot?
Integrate the iRobot Create platform with the previously developed smart camera network.

Using a robot’s **odometry** is a popular navigation scheme which incorporates the combination of incremental motion information over time.

One problem when experimenting with mobile robotics is **localization**: estimating a robot’s position using data received from sensors to identify its relative position and orientation.
BACKGROUND

✓ Localization Methods
Markov Localization
  - Probabilistic Framework
  - Measuring Techniques
Monte Carlo Localization (MCL)
  - Sampling Data
Simultaneous Localization and Map-Building (SLAM)
  - Unknown location/environment
  - Map Building
  - Position Calculation
TECHNICAL APPROACH

✓ Smart Camera Network
✓ Programming the iRobot Create
✓ Serial I/O Protocol
✓ Bluetooth
Using more than one robot and more sensors
Building maps of more than one environment
Controlling the time it takes to actually localize the robot and the smart camera network
Ground markers – line tracking
Map Matching
Structured Environment
Questions

Comments

Concerns
SOURCES


• Esposito, Joel M., Barton, Owen, Koehler Joshua, "Matlab Toolbox for the Create Robot", www.usna.edu/Users/weapsys/esposito/roomba.matlab/, Copyright 2008