

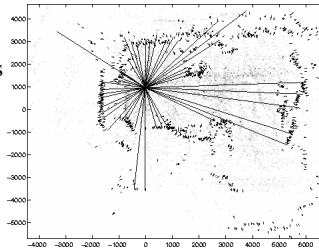
Mapping and Localization 3

Chairs: Bruce Donald, P. Jensfelt

Practical Mobile Robot Self-Localization

Jon Howell and Bruce Randall Donald
Dartmouth College

- mapmaking & localization without explicit landmarks
- compute likely feasible poses based on range data
- repeatably localize to within 5 cm & 1 degree
- result: a simple, effective online algorithm



Environmental Map Generation and Ego-motion Estimation in a Dynamic Environment for an Omnidirectional Image Sensor

Yasushi Yagi, Kouichi Shouya and Masahiko Yachida
Osaka University

- Generation of a stationary environmental map is one of the important tasks for vision based robot navigation.
- In this paper, under the assumption of unknown translational motions of the robot, we propose a method to generate a stationary environmental map and estimate the egomotion of a robot in a dynamic environment, by using an omnidirectional image sensor.
- Two experiments were conducted for evaluating accuracy of measurements and effectiveness in our computer room (6m x 4m). Average errors of the location measurement of the robot and stationary environmental map were approximately 4 cm and 18cm, respectively
- Since both robot and objects move in the environment, the method can detect a moving object and find occlusion and mismatching by evaluating estimation error of each object location.



Civil Engineering Articulated Vehicle Localization: Solutions to deal with GPS Masking Phases

D. Bouvet and G. Garcia
Ecole Centrale de Nantes

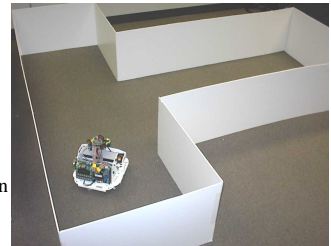
- We propose a reliable 2-D localization system for compactors
- Position error must be lower than 20 cm even during GPS masking phases
- Experimental validation on an instrumented machine



Localization based on Visibility Sectors using Range Sensors

S. Lee, N. M. Amato and J. Fellers
Texas A&M University

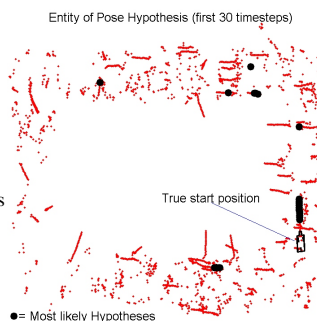
- Precise localization without any landmarks using range sensors
- Preprocessing partitions the workspace into visibility sectors
- Analyze range sensor readings and localize first to a sector, and then to a particular configuration within that sector
- Applicable from any configuration in the environment



Mobile Robot Self Localization Using PDAB

J. Reuter
TU-Berlin

- Kidnapped robot probl. in sparse modeled Env.
- Target-detection in dense clutter solved by MHT
- Maps of natural pointlike-landmarks
- Appr. converges fast, seems to be robust



Position Estimation in Outdoor Environments using Pixel Tracking and Stereovision

A. Mallet¹, S. Lacroix¹ and L. Gallo²

¹LAAS-CNRS and ²Aerospatiale, Chatillion France