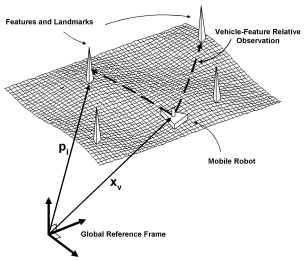
Mapping and Localization 1
Chairs: Illah Nourbakhsh, T. Tsubouchi

A Computationally Efficient Solution to the Simultaneous Localisation and Map Building (SLAM) Problem

Gamini Dissanayake
University of Sydney

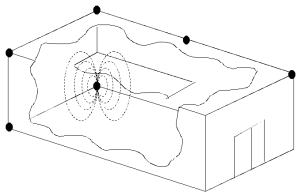
- Robot location without apriori maps
- Efficiency through features with most information
- Experiments on indoor robot with a laser
- Progress towards real-time SLAM



An Indoor Absolute Positioning System with No Line of Sight Restrictions and Building-Wide coverage

E. Prigge and J. How
Stanford University

- Provides 'go-anywhere' freedom for mobile robots
- Beacons installed throughout building create magnetic fields
- CDMA techniques applied
- Initial experimental accuracy of 2.5 cm, 2.5 degrees



Appearance-Based Place Recognition for Topological Localization

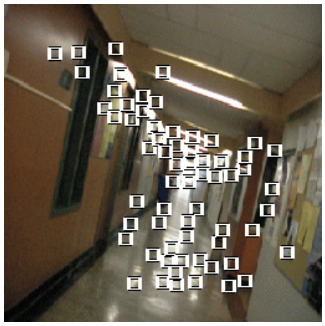
Iwan Ulrich and Illah Nourbakhsh
Carnegie Mellon University

- Topological Localization Indoors and Outdoors
- Histogram Matching of Panoramic Color Images
- Correct Confident Classifications: 87-98
- Incorrect Confident Classifications: 0

Robust Place Recognition using Local Appearance based Methods

G. Dudek and D. Jugessur
McGill University

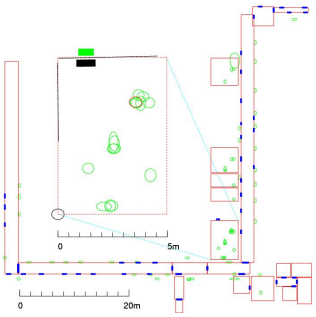
- Making appearance based recognition (using PCA) more robust.
- Recognition is performed in the frequency domain using multiple sub-windows (eigenwindows).
- Scences and rooms can be recognised with varying backgrounds, irrespective of planar rotations and under occluded conditions.
- Promising results are obtained using the proposed methods. PCA is made more robust.



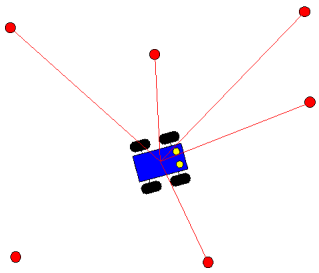
Using Multiple Gaussian Hypotheses to Represent Probability Distributions for Mobile Robot Localization

D. Austin and P. Jensfelt
Royal Institute of Technology

- Multiple gaussian hypotheses are used
- Tree of data association decisions
- Algorithms for tree pruning presented
- Results are given illustrating effectiveness



Invariant Filtering for Simultaneous Localization and Mapping

Matthew C. Deans and Martial Hebert
Carnegie Mellon University

- Localization and mapping from landmark bearings and odometry
- Dual location- and relation-based representations
- Computation & memory limited by enforced independence
- Results shown for simulated and real environments