Sensing for Navigation
Chairs: Kurt Konolige, Edwin Prassler

Autonomous Control of Underground Mining Vehicles using Reactive Navigation
J. M. Roberts[1 3], E. S. Duff[1 3], P. I. Corke[1 3], P. Sikka[1], G. J. Winstanley[1 3] and J. Cunningham[2 3]
[1]CSIRO, [2]CSISO and [3]CRC

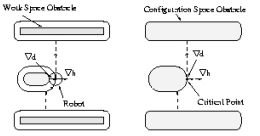
- Automation of a class of underground mining vehicles (LHDs)
- Reactive navigation using wall following and nodal maps
- Full-speed performance of an LHD has been demonstrated
- Automation of LHDs is possible without adding navigation infrastructure

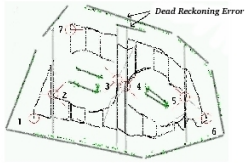
Active Perceptual Anchoring of Robot Behavior in a Dynamic Environment
A. Saffiotti and K. LeBlanc
Orebro University

- Perception must be relevant to the current task
- Anchor: model of a physical object, used by the controller
- Perceptual focus based on 'measure of importance' of anchors
- Used in RoboCup'99 to track several objects simultaneously

Critical Point Sensing in Unknown Environments
E. Acar and H. Choset
Carnegie Mellon University

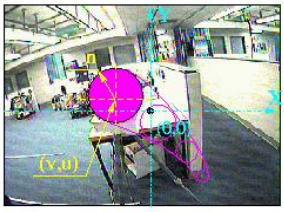
- Complete Sensor Based Coverage of Unknown Environments
- Exact Cellular Decomposition in Terms of Critical Points
- Critical Point Sensing and Algorithms to Encounter All of Them
- Experimental Verification of the Theoretical Results on a Mobile Robot





Optimal Motion Planning in the Image Plane for Mobile Robots
H. Zhang and J. Ostrowski
University of Pennsylvania

- Intro to Visual Motion Planning
- Example for planar robots
- Example for a 3-D robot
- Summary and discussion



High Accuracy Navigation Using Laser Range Sensors in outdoor Applications
Jose Guivant, Eduardo Nebot and Stefan Baiker
University of Sydney

- Autonomous Navigation: Long term / Large areas
- Simultaneous Localization and Map building
- Natural Feature Recognition / Validation
- Outdoor Experimental Results

Feature Extraction for Autonomous Navigation using an Active Sonar Head
E. G. Araujo and R. A. Grupen
University of Massachusetts

- Feature Acquisition for Reliable Indoor Navigation
- Use of Binaural Sonar Head to Extract 2D Features
- Millimeter Precision in Feature Localization
- Active Sensing Allows Reliable Feature Extraction