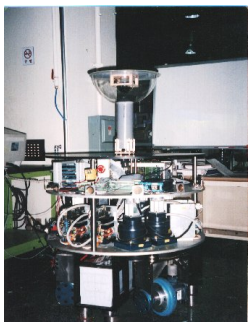
Mobile Robots 1
Chairs: Alberto Elfes, Xiaoping Yun

Geometric Kinematics Modeling of Omni-directional Autonomous Mobile Robot and Its Applications
D. S. Kim, H. C. Lee and W. H. Kwon
Seoul National University

- Necessity of Practical and Simple Kinematics Modeling for the Developed Omni-directional Mobile Robot
- Geomertic Kinematics Model, Basic Trajectory Analysis using Proposed Kinematics
- Path Error Control using Basic Trajectory, Navigation Test using Proposed Kinematics Model
- Design of Kinematics and Inverse Kinematics, Proving Proposed Algorithm through Applications and Implementations

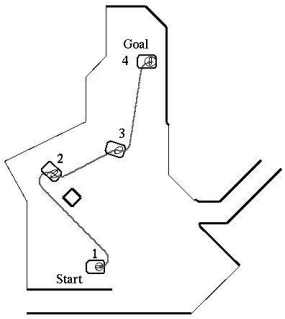


Topological Characterization of Safe Coordinated Vehicle Motions
R. J. Milgram[1] and S. G. Kaufman[2]
[1]Stanford University and [2]Sandia National Laboratories

- Problem: Motion Planning of vehicles on a network
- Method: Calculate configuration space
- The resulting space is much simpler than expected
- Algorithms based on this space implemented

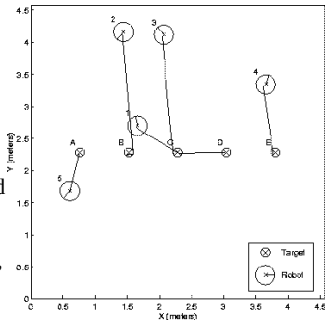
Landmark-Based Safe Path Planning for Car-Like Robots
A. Lambert and Th. Fraichard
INRIA

- Nonholonomic path planning integrating cumulative drift error
- Define & use localization regions based on world features
- Safe paths planned for indoor, car-like vehicle
- Uncertainty & nonholonomy dealt with in path planning



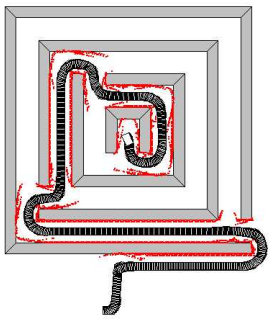
A Utility Approach to Multi-Agent Coordination
T. B. Gold, J. K. Archibald and R. L. Frost
Brigham Young University

- Devise distributed algorithm for robots to create formation
- Satisficing approach used, similar to cost-benefit analysis
- Distance, convergence measured as number of robots varies
- Praxeic utility approach flexible, effective



A New Local Path Planner for Nonholonomic Mobile Robot Navigation in Cluttered Environments
G. Ramirez and S. Zeghloul
Universite de Poitiers

- Feasible Velocities Polygon - a new obstacle description
- A two-module planner inspired by the Bug algorithm
- Optimization-based approach with global convergence
- Well adapted for use with embarked sensors



Precision-calibration of Fiber-optics Gyroscopes for Mobile Robot Navigation
L. Ojeda, H. Chung and J. Borenstein
University of Michigan

- Bias drift is small, non-linearity and temperature dependency become significant.
- Calibration method described here aims at reducing the resulting errors.
- Reduction of errors of one order of magnitude were obtained.
- Gyro calibration shown to improve the performance dramatically.