Mobile Robotics
Organizers & Chairs: Raja Chatila, Shin'ichi Yuta

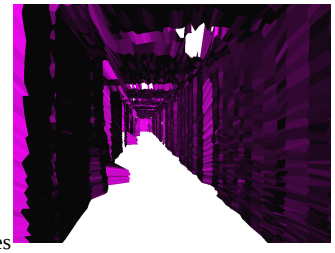
Overview of Mobile Robots
Raja Chatila
LAAS/CNRS

Mobile Robot Navigation in Indoor Environments using Object and Character Recognition
M. Tomono and S. Yuta
University of Tsukuba

- Model-based navigation in unknown indoor environments.
- Object and character recognition with position estimation.
- Navigation to the door designated by room number.
- The method enables navigation without an accurate map.

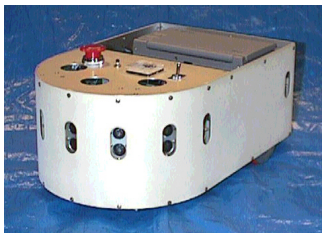
A Real-Time Algorithm for Mobile Robot Mapping With Applications to Multi-Robot and 3D Mapping
S. Thrun[1], W. Burgard[2] and D. Fox[1]
[1]Carnegie Mellon University and [2]University of Freiburg

- Building 3D Maps online with teams of mobile robots
- Fast probabilistic techniques for simultaneous localization and mapping
- 3D maps of building interiors acquired in real-time
- Opens up many new opportunities



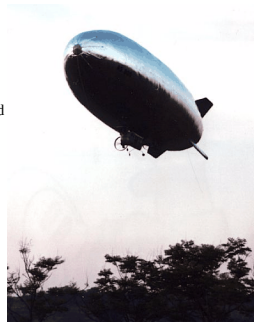
It's Time to Make Mobile Robots Programmable
Y. J. Kanayama[1] and C. T. Wu[2]
[1]MotionLab Inc. and [2]Naval Postgraduate School

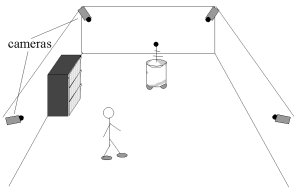
- Design and implement practical high-level programmability for mobile robots.
- A Java-based Motion Description Language (MDL) that is built on the solid mathematical foundation is proposed.
- MDL is implemented successfully and running on a prototype robot Swan.
- MDL is the FIRST high-level mobile robot language and a good candidate for the STANDARD language.



Towards Dynamic Object Identification Using Stochastic Lattice Models and Optimal Design of Experiments
A. Elfes, M. Bergerman and J. R. H. Carvalho
Center for Information Technology, Brazil

- We are developing robotic airships for cost-effective environmental, biodiversity and agricultural research and monitoring.
- Autonomous identification of man-made structures, pollution sources, fauna and flora, crop types, disease-affected plantation areas, and animal herds are some of the typical recognition tasks that the AURORA I robotic airship will be used for.
- The paper describes a dynamic approach to target identification that uses stochastic lattice models and optimal design of experiments for effective selection, recognition and tracking of relevant targets.
- Results are shown for identification of man-made structures and animal herds.



Sensor Network Perception for Mobile Robotics
A. Hoover[1] and B. D. Olsen[2]
[1]Clemson University and [2]Aalborg University

- Third-person sensing
- Gestalt control
- Prototype demonstration
- High speed + precise geometry