

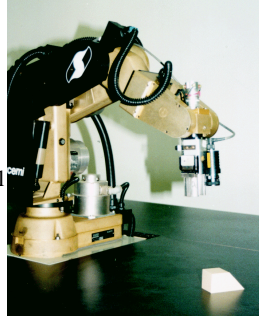
Sensing Strategies and Control 2

Chairs: D. Kriegman, Alfred A. Rizzi

High Speed Visual Servoing of a 6 DOF robot Using MIMO Predictive Control

J. Gangloff and M. de Mathelin
Ecole Nationale Supérieure de Strasbourg(ENSPS)

- 120 Hz visual servoing
- Dynamical model of the visual loop
- MIMO Generalized Predictive Control
- 6 DOF target tracking experiment



Robust Video Based Object Recognition Integrating Highly Redundant Cues for Indexing and Verification

C. Eberst, M. Barth, K. Lutz, A. Mair, S. Schmidt and G. Farber
Technische Universität München

- robust and inexpensive object recognition for mobile robots
- combination of diversitary strategies for hypothesis generation/verification
- robustness against scene complexity and sensing conditions
- reusing joint features for performance at little cost



Towards Robust Sensor-Based Maneuvers for a Car-Like Vehicle

F. Large, S. Sekhavat, C. Laugier and E. Gauthier
INRIA, Rhone-Alpes

- Reactive Control Architecture for a Car-Like Vehicle
- Artificial Neural Networks to modelize the robot kinematics
- Real-time Adaptation using Online Learning
- Experimental results for the trajectory following maneuver

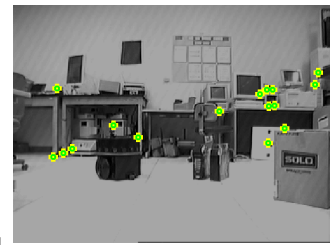


Selecting Promising Landmarks

Markus Knapek¹, Ricardo Swain-Oropeza² and David J. Kriegman²

¹Technical University of Munich and ²University of Illinois at Urbana-Champaign

- Selecting best landmarks for visual-based navigation tasks
- Only perceptually salient and visually distinctive landmarks are selected
- Harris detector, K-jets and Mahalanobis distance are used in this method
- Experimental results performed in indoor environments

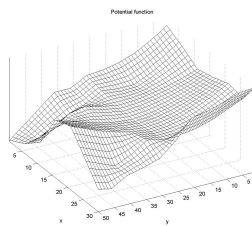


Dealing with robustness in mobile robot guidance while operating with visual strategies

G. Bianco¹ and A. Zelinsky²

¹University of Verona and ²The Australian National University

- Studying features related to visual guidance methods
- Analysis of the visual navigation vector field
- Visual learning and robustness features are measured
- Motion fields provide bases for addressing motion features



Two-Level Visual Control of Dynamic Look-and-Move Systems

F. Conticelli and B. Allotta
Scuola Superiore Sant' Anna

- In this paper, the problem of controlling dynamic look-and-move systems, taking into account the linear robot dynamics in the visual control loop, is solved by applying backstepping approach.
- Assuming the existence of a local smooth stabilizing control law for the visual system, the proposed control algorithms address the problem of the stabilization of the interconnected system including the linear robot dynamics.
- Experimental results obtained with the PUMA 560 robot eye-in-hand configuration show that system performance is satisfactory in the positioning with respect to target objects in real conditions.
- Typical tasks based on the proposed approach could be: high-performance vision-based manipulation, and assembly operations.

