

Visual Servoing 2

Chairs: Francois Chaumette, Henrik Christensen

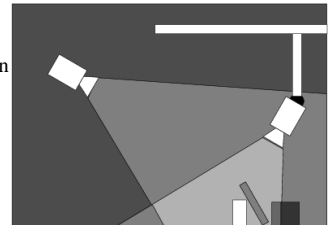
Robust Vision-Based Pose Control

C. Taylor and J. Ostrowski
University of Pennsylvania

Eye-in-hand/Eye-to-hand Cooperation for Visual Servoing

Gregory Flandin, Francois Chaumette and Eric Marchand
IRISA - Campus Universitaire de Beaulieu

- Cooperation of Global and Local Cameras
- Solutions are based on perturbation estimation and task redundancy
- They are compared thanks to experimental results
- The stability was proved and confirmed with experimentations

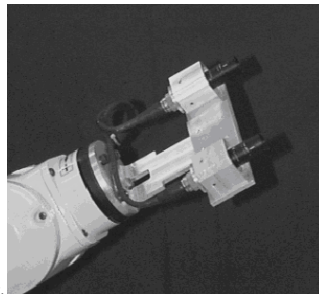


A Novel Visual Servoing with Stereo Cameras using QR Decomposition and Disturbance Observer

J. S. Lee¹, I. H. Suh², B. J. You¹ and S. R. Oh¹

¹Korea Institute of Science and Technology and ²Hanyang University

- A novel visual servoing approach is proposed by adopting disturbance observer and QR decomposition.
- QR decomposition factors any image Jacobian into a unitary matrix and an upper triangular matrix.
- Disturbance observer compensates errors induced in block diagonalization of the upper triangular matrix.
- Block diagonalized triangular matrix improves performance indices such as measurement sensitivity of image features, control sensitivity and controllability.

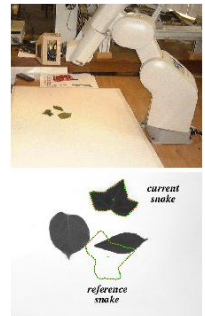


Automatic Segmentation and Matching of Planar Contours for Visual Servoing

G. Chesi¹, E. Malis² and R. Cipolla²

¹Universita di Siena and ²University of Cambridge

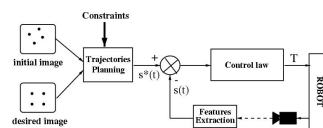
- This work concerns visual servoing with respect to planar contours without any a priori knowledge of them shape.
- Matching is done together with the estimation of the homography matrix between a target and current view of the contour. Then, a 2 1/2 D visual servoing technique is used to reposition the end-effector of the robot at the target position.
- The system has been successfully tested on several contours with very complex shapes such as leaves, keys and the coastal outlines of islands. The experiments show that the system can position the robot end-effector with a great precision even for large camera displacements.
- In order to simplify the matching problem, the only hypotheses made here are that the contour is planar and that occlusions can occur only during the tracking stage. Future work will be devoted to matching planar objects with occlusion.



Path Planning in Image Space for Robust Visual Servoing

Youcef Mezouar and Francois Chaumette
IRISA - Campus Universitaire de Beaulieu

- Path planning in image space coupled to Image-based Servoing
- Robust wrt calibration errors for any initial position
- We obtain a satisfactory 3D camera trajectory
- and all the object remains in the camera field of view



Potential Switching Control in Visual Servo

K. Hashimoto and T. Noritsugu
Okayama University

- Stable region of visual servo – Local
- Potential switching – Enlarge stable region
- Potential plots for 1 DOF and 2 DOF cases
- Visual servoing with 6 DOF robot

