Abstract

This paper presents a binocular eye-to-hand visual servoing system that is able to track and grasp a moving object in real time. Linear predictors are employed to estimate the object trajectory in three dimensions and are capable of predicting future positions even if the object is temporarily occluded. For its development we have used a CRS T475 manipulator robot with six degrees of freedom and two fixed cameras in a stereo pair configuration. The system has a client-server architecture and is composed of two main parts: the vision system and the control system. The vision system uses color detection to extract the object from the background and a tracking technique based on search windows and object moments. The control system uses the RobWork library to generate the movement instructions and to send them to a C550 controller by means of the serial port. Experimental results are presented to verify the validity and the efficacy of the proposed visual servoing system.

Keywords

Linear prediction, visual servoing, tracking, grasping, stereo vision, camera calibration.