Intelligent **R**obotic **V**ision

Dissertation

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Abstract

This thesis presents a stereo active vision system that is designed for a humanoid robot. This task was decomposed into four layers as object localization, tracking, control and depth measurement. We adopted the developmental approach, which is based on intelligent techniques. Neural networks and Fuzzy algorithms are used for the object localization. For tracking, searching most similar region approaches (Camshift and Particle filter) were utilized. A neuro-fuzzy prediction mechanism in tracking module made the tracking more stable. The stereo active vision system was controlled using adaptive and fuzzy algorithms which modify their behavior depending on the movements carried out by the tracked object. For the depth determination, we used a simple correspondence procedure based in a epipolar assumption. As a result of the combination of these modules and techniques, the system demonstrated real time tracking, velocity, and robust control.

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