

ABSTRACT

Robot is a machine that can do the work of a person and that works automatically or is controlled by a computer. Robot vision has been the source of countless research contributions, from the domains of both vision and control. Vision is becoming more and more common in applications such as localization, automatic map construction, autonomous navigation, and risky situation detection.

This final project designs system for robot navigation using image processing. Designed system consists of direction and position recognition. This system used methods such as : grayscalling and edge detection for pre-processing; Standard Hough Transform (SHT) and Speeded-Up Robust Features (SURF) for feature extraction; and K-Nearest Neighbor classifier.

System's outputs are direction (left-turn, cross-road, right-turn, and dead-end) and position (A, B, and C's field). The best accuracy for direction detection is 91,88% by real-time testing at daytime and position detection is 100% by using number of blurring and number of octave [2 2], [2 3], [2 4], [3 2], [3 3], [3 4], [4 2],[4 3], and [4 4] respectively. System only needs about 19ms for both direction and position recognition.

Keywords : robot, navigation, direction, position, image processing, standard hough transform, speeded-up robust features