

ABSTRACT

Robots are needed to facilitate human work, especially for office and home services. Global competition and increasing efficiency make researchers develop applications that robots do not have before. These applications require robots that can move and perform tasks simultaneously. In its development, robot vision has become an idea for some research, because developers want a robot that can "see". With vision, robots can do things like automatic navigation, localization, automatic map construction and many more. Localization or position recognition can be done one of them by recognizing a landmark that's in the vicinity.

This final project designed natural landmark detection system on robot by using digital image processing. Designed system is the sequential landmark detection. The tool used is a camera that is stored on a wheeled robot. Robot move in a way controlled by human. This system used methods such as: grayscaling, Gaussian Pyramid and Zero Padding for pre processing; 2D FFT for feature extraction; and Normalized Cross Correlation (NCC) for Pattern Matching.

This system has a position output (landmark areas 1, 2, 3, and 4). System testing is performed nonreal-time in 2 different scenarios. The best accuracy to detect the landmark is 99.67% obtained when threshold value is 0.99. The second landmark is the easiest landmark to detect with an accuracy value of 100%. System only needs about 6ms to detect a landmark.

Keywords: robot, detection, position, image processing, landmark, normalized cross correlation.