APPLICATION OF FUZZY Q-LEARNING CONTROLLER FOR AUTONOMOUS ROBOT SYSTEM THAT BE INTEGRATED WITH CMUCAM 3.0

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ABSTRACT

The development of robotic technologies nowadays have entered an era where robot was created like human from the appearance, the basic ability, until the thinking ability. One of the ability that was copied is vision ability.

This research has a purpose to make an autonomous robot. Using a camera CMUCAM 3.0 as a sensor, robot can learn the environment around him. After success of learning, robot is supposed to trace the track, avoid the track, and find material targets. As a data executor from CMUCAM 3.0, ATMEGA16 Microcontroller is used.

Fuzzy Q-learning is used as a method of controller. This method will give a reward and punishment which depend on the success or the failure of robot when execute an event. After doing the design, implementation, testing, and analysis found that the ability of robot to learn, the environment around him, is influenced by by the number of collisions that occur and the variations of object types that are recognized by the robot in a learning cycle. Learning ability will be increased if robot, in a learning cycle, crash barrier on different type of objects. In this thesis, for the number of obstacles are two of two variations, obtained the number of ideal learning cycles for autonomous robot are about 3 times.

Keywords: fuzzy q-learning, CMUCAM 3.0, autonomous robot, learning ability.
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