ABSTRACT

Technological developments in the field of mobile robot especially on legged robot cannot be separated from the locomotion issue of the robot itself. Locomotion issue in the legged robot movement is very important, because the locomotion of the legged robot has a method that is more complex than wheeled robots, where each foot should be able to move while the other leg can maintain the balance of the robot. however, legged robot is superior compared to a wheeled robot in terms of its adaptively with the terrain surface motion, because robot with legs can walk through rough terrain. Therefore, in order that the robot can perform a stable movement and efficient in the side of its program code, required appropriate locomotion method to be applied to a legged robot.

Inverse Kinematics is one of the appropriate locomotion method to be used on legged robots. Because by knowing the position of end effector, we can find the angle is needed on every actuator / DOF (degree of freedom), while combined with the method of sine pattern that can generate values group of end effector position in a pattern of sine wave that can be used to solve input value calculation problem on inverse kinematics. In this reseseach, the locomotion method is implemented on autonomous qudruped robot, namely robot with 4 legs and 3 DOF on each legs.

The results of this research is locomotion control systems in autonomous quadruped robot with inverse kinematics and sine pattern methods, with using trot gait pattern as its walking gait. Therfore, we can get the robot to walk stably on an even or uneven terrain.

Keywords: quadruped robot, inverse kinematics, sine pattern, DOF, end effector, trot gait