ABSTRACT

A complex interaction between mechanical and electronic of a robot has made mechatronic approach is important to do. The approach can be a 3D model of robot's physical built on a computer using CAD (Computer-aided design) software. Computer modeling helps minimalizing the cost of prototype and development errors.

Denavit-Harternberg Parameters of a multi-body robot must be determined to obtain a mathematical visualisation. The multi-body consists of several links connected each other by joints. Denavit-Haternberg parameters are obtained from derivative of each joint axis. Coordinate transformation on each joint describes the relation between the end-effector and the base coordinate frame. This transformation is required to control the movement of the end-effector in respect of the base using kinematic analysis. Inverse kinematics function generates joint angles which describe manipulator's behaviour.

To apply the kinematics, a humanoid arm is designed and developed using Autodesk Inventor and MATLAB/ Simulink. The end-effector has some task to track the target coordinate Px, Py, Pz. The peak time of angle variances are; jointclav at 4.168s with angle value $1.89e + 00$, jointbicep at 0.063 s with angle value $1.011e + 01$, jointfore at 1.929s with angle value $-5.682e + 00$, and jointpalm at 0.063s with angle value $4.428e - 01$.

Keywords*: inverse kinematic*, *CAD*, *Denavit-Haternberg parameter*, *multibody*.