

**PROTOTYPING 4 DEGREE OF FREEDOM ROBOT ARM FOR
KINEMATIC AND DYNAMIC ANALYSIS**

By

Amadea Widi Dewata

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SWISS GERMAN UNIVERSITY

The Prominence Tower

Jl. Jalur Sutera Barat No. 15, Alam Sutra,

Tangerang 15143

Indonesia

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

Amadea Widi Dewata, S.T.

Student

Date

Approved by:

Dr. Ir. Hanny J. Berchmans, M.T., M.Sc.

Thesis Advisor

Date

Aulia Arif Iskandar, S.T., M.T.

Thesis Co-Advisor

Date

Dr. Irvan S. Kartawiria S.T., M.Sc

Dean

Date

Amadea Widi Dewata

ABSTRACT

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By

Amadea Widi Dewata, S.T.

Dr. Ir. Hanny J. Berchmans, M.T., M.Sc.

Aulia Arif Iskandar, S.T., M.T.

SWISS GERMAN UNIVERSITY

Nowadays, technology developments are advancing rapidly. The demands of life for humankind require humans to be able to move quickly to achieve their goals, take examples such as transportation, health, communications and industry. In today's industrial world the development has been toward internet-based which aims to increase the productivity of an industry. Increased industrial productivity is similar to the increasing use of industrial robot arms. The robot arm is already in the trust of the industrial community to replace the performance of humans. The robotic arm uses the same movements as the movement of the human hand, where the robotic arm requires the coordinates of the position to move. Position coordinates serve as input or source commands to know the robot arm is in a position where or even find the position of coordinates to be addressed. The kinematic and dynamic of robot arm is related to the number Degree of Freedom (DOF) of the robot arm. Kinematic analysis of robot arm discusses the position and movement of the robot arm. Meanwhile, the dynamic analysis discusses the acceleration and delivered force of robot arm during operation. In this thesis, the work are focused on the development of a 4 DOF robot arm prototype. Denavit–Hartenberg (DH) parameters method was implemented to develop the kinematic analysis of the 4 DOF robot arm prototype. Kinematic and dynamic examination of the robot arm prototype results show that the position and movement accuracy of the robot are influenced by some key factors which are rigidness of the links, stability joints installation, the quality of servomotor for active joints and end effector load.

Keywords: 4 DOF, Robotic Arm, Kinematic, Dynamic, D-H Parameters.



DEDICATION

Thanks to the Lord Jesus and Mother Marry for all blessing during my thesis process.
I dedicate this works for my lovely parents Andreas Marsudi and Nanik Widyastuti, my
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I admit this fast track program of master degree difficult to follow, but I believe this is well paid in the end and will be used in future for a good reason.

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