HIGHER TECHNICAL INSTITUTE

MECHANICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

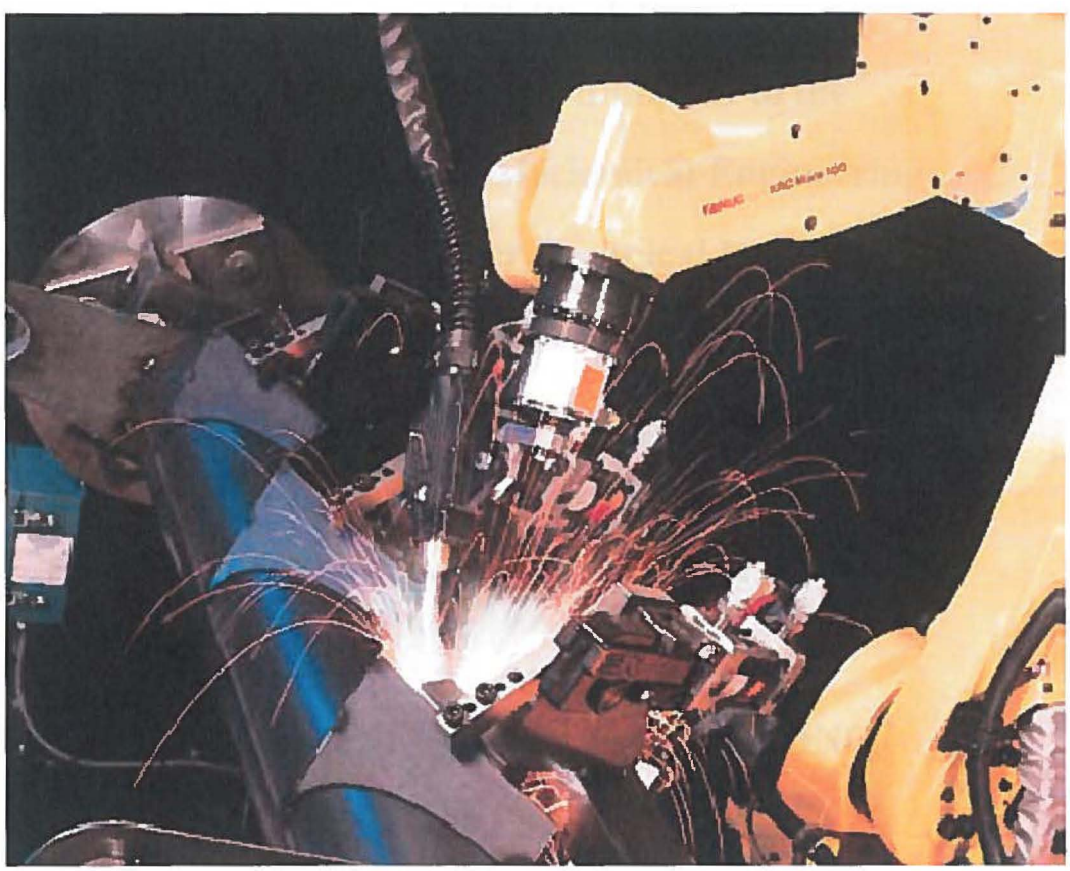
THE DEVELOPMENT OF A DEMONSTRATION PROGRAM ON THE FANUC 100i INDUSTRIAL ROBOT

BY CHRISTOS PETROU

M/1049

JUNE 2008

THE DEVELOPMENT OF A WELDING DEMONSTRATION PROGRAM ON THE FANUC 100i INDUSTRIAL ROBOT



THE DEVELOPMENT OF A WELDING DEMONSTRATION PROGRAM ON THE FANUC 100i INDUSTRIAL ROBOT

by

Christos Petrou

Project report submitted to the

Department of Mechanical Engineering

Of the Higher Technical Institute

Nicosia Cyprus

In partial fulfillment of the requirements

for the diploma of

TECHNICAL ENGINEER

in

MECHANICAL ENGINEERING

June 2008

Project Number: M/ 1049

THE DEVELOPMENT OF A DEMONSTRATION PROGRAM ON THE FANUC 100i INDUSTRIAL ROBOT

by Christos Petrou

SUMMARY

The objective of the project was the development of a demonstration program using the FANUC 100i arc welding Robot installed at HTI laboratories.

After an extensive literature search about robotics generally, using HTI Library and Internet, the demonstration workpiece was decided and constructed. To achieve the best support during the welding operation, without obstructing the robot, a special fixture with steel plate was constructed.

After familiarization with arc mate 100i the welding program was developed and then optimized for the best performance, like speed and smoothness of motion.

ACKNOWLEDGMENTS

I wish to express my sincere gratitude to my project supervisor **Dr. Andreas Stassis,** Mechanical Engineering lecture at HTI, for his quittance and priceless assistance he offered me in executing this project.

Christos Petrou

LIST OF CONTENTS

CHAPTER 1 INTRODUCTION IN ROBOTICS

- 1.1 ROBOTS

CHAPTER 2 ROBOTS IN INDUSTRY

- 2.1 WHY INDUSTRIAL ROBOT ARE USED
- 2.2 ROBOTS POPULATION AROUND THE WORLD

CHAPTER 3 ROBOTIC APPLICATION

- 3.1 ARC WELDING
- 3.2 SPOT WELDING
- 3.3 OTHER APPLICATION

CHAPTER 4 ROBOT ANATOMY

- 4.1 THE MAJOR COMPONENTS OF A ROBOT
- 4.2 THE GEOMETRIC CONFIGURATION OF ROBOT
- 4.3 ROBOT CLASSIFICATION ACCORDING TO INTELLIGENCE LEVEL
- 4.4 ROBOT CLASSIFICATION ACCORDING TO CONTROL SYSTEM
- 4.5 ROBOTS BASIC PROGRAMING LANGUAGES

CHAPTER 5 THE FANUC 100i INDUSTRIAL ROBOT

- 5.1 THE FANUC INDUSTRY
- 5.2 THE SYSTEM BENEFITS OF ARC MATE I SERIES ROBOT
- 5.3 THE FANUC ARC MATE 100i INDUSTRIAL ROBOT
- 5.4 DIMENSIONS & SPECIFICATION

CHAPTER 6 DEVLOPMENT OF A DEMOSTRATION PROGRAM ON THE FANUC 100i ROBOT

- 6.1 PROGRAMMING THE ARC MATE 100i ROBOT
- 6.2 THE DEVELOPMENT OF A DEMOSTRATION PROGRAM IN ARC WELDING

CHAPTER 7 CONCLUSIONS & DISCUSSIONS

CHAPTER 8 REFERENCES

Including a CD : operation of Arc welding