HIGHER TECHNICAL INSTITUTE

MECHANICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

MODELING AND SIMULATION OF ROBOTS USING WORKSPACE III SOFTWARE

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ANTONIS SKITSAS

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BY: ANTONIS SKITSAS

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MODELING AND SIMULATION OF ROBOTS

USING WORKSPACE III SOFTWARE

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PROJECT REPORT

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Dedicated to my family
and to my best friend Bill Ioannou
for their useful help and support

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MODELING AND SIMULATION OF ROBOTS USING WORKSPACE III SOFTWARE

By: *ANTONIS SKITSAS*

SUMMARY

For the purpose of becoming aware of robots and their connection to humans this work begins with explaining that robots are, in fact, a main part of people's life. As it will be described later on, robots can easily perform both human and non-human work. They also have many advantages, which will be also described later in detail. However a number of drawbacks are performed by robots, which are referred to in the form of problems and limitations of using robots.

Antonis Skitsas has produced this work in order to provide a better understanding of robotic simulation, which involves the designing and applying of a whole robot system. Through describing the different functions of robots, a clear elaboration on the importance of robots in daily life and especially work life is emphasized. Throughout the project the Workspace III Software Simulation package is used to allow robotic simulation to take place. So, by becoming familiar with this program, the user is able to understand how simulation takes place and he will be able to simulate a production cell.

INTRODUCTION

It is amazing how life in the world environment was a few decades ago and how it is nowadays; it has become more automated rather than manual. The horizontal growth of technology is already a part of people's life. We are, in fact, surrounded by objects produced by machines, many of which completely fit the above-cited definitions of robots of higher or lower levels at sophistication. For as long as recorded in history, people have wanted to make real artificial people to be their slaves. The ultimate dream was and is a mechanical person who is a slave of a real person. Robots are also needed to engineer real machine and to do real work. It has become useful for commercial prestige to apply the words "robot" and "robotic" to any smart machine.

During the mid 1960s Joe Engleberger patented a design for a computer controlled mechanical arm and formed a company together with George Devel, called Unimation. That arm was functioning as the telechirs or tele-operated arms of 1940s and was used to manipulate radio-active materials from behind the safety of lead-glass screens. Then it was replaced by computer control, using technology for computer machine tools. Later in the early 1970s when Engleberger visited Japan, he gave them the chance to realize the potential of these Industrial Robots and to invest on them.

The original scope of robots was to replace human work and there application was paint spraying and welding. Then more developed robots

were made for performing some more functions. It was then, when robots were seen to do work humans could not. In the early 1980s when economic depression was taking place worldwide, robots were considered as a cure. However, they also had passed a depression since they were used in the manufacturing industry, since they were essential for a modern production line and it was clearly that no technology could live up to such promises.