**Final Project MAT188**

**Engineering Problem #6: Robot Movement and Control - Part I**

1) Step 1: Understanding the Problem: What is your goal? What relevant information have you been given? What are the fundamental scientific and/or mathematical concepts that you will have to use to solve this problem? Include a simple hand-sketched diagram if it would be helpful.

The goal of the problem is to find the velocity and the acceleration of the robot, use polynomial fitting method to approximate velocity and acceleration in a more realistic way. Finally, design a plan with certain velocity and acceleration to enable a robot to do a revolution motion. The problem Statement give a 61 \* 3 matrix describing the position of the robot in 60 seconds. In the problem solving stage, it involves some basic physical concept: distance, velocity and acceleration. Also with mathematical concepts: the operation of vectors and curve fitting.

2) Step 2: Devising a Plan: Without writing or including in your submission ANY MATLAB code, write out your step-by-step process that you plan on using in order to address this problem. This might include:

a. The plot or plots you will generate to support your assessment and solution. What do the x and y (or x, y, and z) axes represent?

In part A, graph which has x-position vs. y-position of the robot, graph which has velocity of the robot vs. time, and graph which has acceleration of the robot vs. time are necessary.

In part B, graph which has x-position of robot vs. y-position of the robot, and x-position of fitting scenario vs. y-position of fitting scenario, graph which has velocity of the robot, velocity of fitting scenario vs. time, and graph which has acceleration of the robot, velocity of fitting scenario vs. time are necessary.

In part C, graph which has x-position vs. y-position of the designing path of the robot, graph which has velocity of the designing path of the robot vs. time, and graph which has acceleration of the designing path of the robot vs. time are necessary.

b. The “algorithm”, or step-by-step process you will use in your MATLAB script. This should be written in plain English, no need to use proper or exact MATLAB syntax. If appropriate, include a graphical interpretation (flowchart) for your problem solving process. Please also include any decisions/assumptions that you have made.