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EE 449 – Computer Interfacing

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Final Project Report – Physical Therapy Robot

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1. Project Performance

There were two sets of goals for this project, the milestones and the learning objectives. The milestones were a breakdown of small goals which ultimately led to the end goal of the project, which was to have a robot monitor and demonstrate physical therapy exercises. These milestones were to assemble the robot, test and calibrate the robot, have the robot perform 3 types of walking behavior, send real time information from the Kinect to the robot, and have the robot mimic the Kinect monitored walking behavior. Due to unforeseen technical difficulties, I was only able to finish the first milestone. I could not set up communication to make the robot move and therefore, the rest of the milestones could not be completed.

At the end of week 6, the class was informed that our project was also designed with a learning goal in mind. For the physical therapy robot, my learning goal was to gain experience with the fine tuning process of making the robot move correctly. Unfortunately, this goal could not be met because of the difficulties described above. I did, however, learn how to troubleshoot when things did not go as planned.

2. Administrative Performance

The administrative involvement in this project was limited to supplying the robot. I was told that the robot was assembled and the rough calibration was completed, but this was not the case. After completing the calibration, the software would not communicate with the robot. Eventually, a correction to the manual was found stating the robot had been rough calibrated improperly and had to be disassembled and reassembled again. The administration was not able to help resolve the problems. In the future, it would be a more effective learning experience if the

administration had ensured the functioning of the robot and had knowledge on it before having the student put their time into it.

3. Organizational Structure

The project was meant to simulate a real world project. The classes were meant to be our working hours and just like in a real world situation, we were expected to put in extra time to ensure our goals were met. These goals were set out in a Work Breakdown Structure, a Gantt chart, and a Pert chart. With these structures in mind, we were able to keep track of what needed to be done by the conclusion of the project.

4. Team Performance

This project was not a team project. Each student had their own project to complete by the end of week 7. There was, however some teamwork involved in the required materials needed to complete our websites. Working together ensured that we all understood what needed to be uploaded by the conclusion of the project. I think the milestones set were a bit ambitious for working without a team. Had this been a group effort, I think more of the milestones could have been met by the end date.

5. Techniques of Project Management

The project management techniques used in this project were all kept track of using Microsoft Project. We used this software to create a Work Breakdown Structure, a Gantt chart, and a Pert Chart. A Work Breakdown Structure is a list of tasks needed to be finished to meet the end goal of the project. Each of these tasks is assigned a difficulty level and a long, short,

expected, and average time to completion. They are also labeled by their dependence on other tasks. The Gantt chart is used to visualize the time line in which these tasks will be completed and the Pert chart is used to visualize the order in which they will be completed. These structures helped to keep in mind what needed to be finished by when in order to meet the end goal. They also gave an idea of the amount of work needed to be done outside the class hours. The Pert and Gantt charts also give the ability to crash a schedule by completing tasks that are not dependent on future tasks. Unfortunately, all future tasks in my project were dependent on the fine tuning of the robot, which I was unable to finish in time. Therefore, I could not crash my project to at least finish other tasks and milestones.

6. Benefits of the Project

Although I was not able to get very far with my project, I do believe that it was beneficial in that it forced me to figure out my problems and turn to the internet and outside resources for help. The answer is not always going to be directly in front of you. I think this is a very good project, however, it would likely be a better experience if my recommendations in the Administration section were followed. In order for this project to work, it is likely that a new robot or at the very least a different microcontroller be used to ensure the functioning of the robot. If these things are done, I think it would be very possible to complete a few more of the milestones in the allotted time and achieve the learning objective.