SUMMARY

My Report will include the Following Things

1. Theory of Machines: This Part of the project include reading Basic Mechanics and Mechanism due to no prior background to the field of Robotics. Some Topics like Basic Mechanism, Degree of Freedom, Velocity Analysis, Acceleration Analysis, DH Parameters, Euler’s Angle, Rotation Matrices. Derivation and Solution of some basic parallel Manipulators (Two bar, Three bar, Four bar). Working out animation for deeper understanding of Two bar, Three bar, KUKA, PUMA in RoboAnalyser.
2. Learning MATLAB and Its Application: I learned how to Program in MATLAB and Did some Exercises in Matlab. Learned Basic Animation, Plot’s , Matrix Functions and creating Required Structures using matlab.
3. Animating Stewart: This was one of the Advanced exercises of MATLAB. Firstly calculated the co-ordinated of the required points then changing their frames to a General frame and then made a Model of Stewart using Matlab code and then improved upon its Graphics aspect’s and tested different Trajectories by creating Matlab animations before running the actual code on the mechanical structure.
4. Interfacing Arduino and Stewart: Learned How to interface different kind of motor’s using Arduino and wrote a code in Arduino for the Creating Different Types of trajectories (Circular, Eight) of the center point of the upper plate by that code. Getting the leg length’s from the inverse Kinematics function and sending them to the Servo motor, all that is included in this part. Learned how to interface Stewart and Arduino using Matlab.
5. PCB: Learned about the basic of printed circuit boards and why they are useful how they are used their types and designing a PCB.
6. Four Bar Mechanism: Solved the four bar mechanism and all types of the case involved in it Crank-Crank, Rocker-Rocker, Crank-Rocker, Parallel Crank and creating a Matlab program which ask input as side lengths and angular velocity and displaying the type of the linkage (Crank-Crank, Rocker-Rocker, Crank-Rocker, Parallel Crank) and then animating the Mechanism.
7. Designing and Modifying Stewart’s Base: This is the ongoing exercise and is about modifying the base so that base parameters can be easily changed without creating a whole new physical model for base. For this I am using SolidWorks as the tool and learning the software to full proficiency levels to accomplish the task and improve upon the base.

This was the summary of the tasks accomplished and the ongoing ones.

Respected Prof. S K SAHA

I would request you to provide me

1. A Certificate stating that I worked under your guidance for a period of 6 Weeks and task accomplished by me, the software learned and used (MATLAB, SolidWorks) by me during this period.
2. The KVPY office would require a letter (that they will provide after completion of internship) duly signed and sealed by you
3. A letter of Recommendation by Prof. S K SAHA after analyzing the number of tasks accomplished in a duration of 6 weeks just after the completion of first year without having any prior background in the field of Robotics and Mechanical Engineering. The ability to learn and adapt to new type of field, environment and equipment’s. The ability to rapidly learn new Software’s and programming tools.

Regards

Prateek Yadav