Simulation of a Dancing Dog Robot in V-REP

Summary / Outline

The primary objective of this project would be to create a robot that imitates the motion of a real-life dog and giving it characteristics that allow the robot to perform certain dance moves.

Introduction

VREP is a robot simulator with an IDE and is based on a distributed control architecture. It is very versatile and includes various features to make our task easier.

Techniques to be Implemented: Forward Kinematics and Inverse Kinematics. (And possibly Trajectory Planning) of the created robot's arms & legs

Programming Language: Python / C++

Robot Specifications

The plan is to replicate the motion as close to real-life as possible so here is a possible specification of the robot:

Head: 1R with 2 links that connect the robots head to its body and the joint replicates the neck motion. Note that we don't use a Spherical joint here as it is not necessary.

(Possibly a Spherical joint replicating the Shoulders of the robot mentioned in video below)

Body: I am not sure how to do trajectory planning yet since I don't have much experience in V-REP and what its capabilities are. If it is possible, I will implement that as well.

Arms & Legs: 3R units replicating groin, knee and ankle movements.

Diagram

I am using a new platform V-REP and I don't really know how the final visualization could be but here I have attached a rough sketch:

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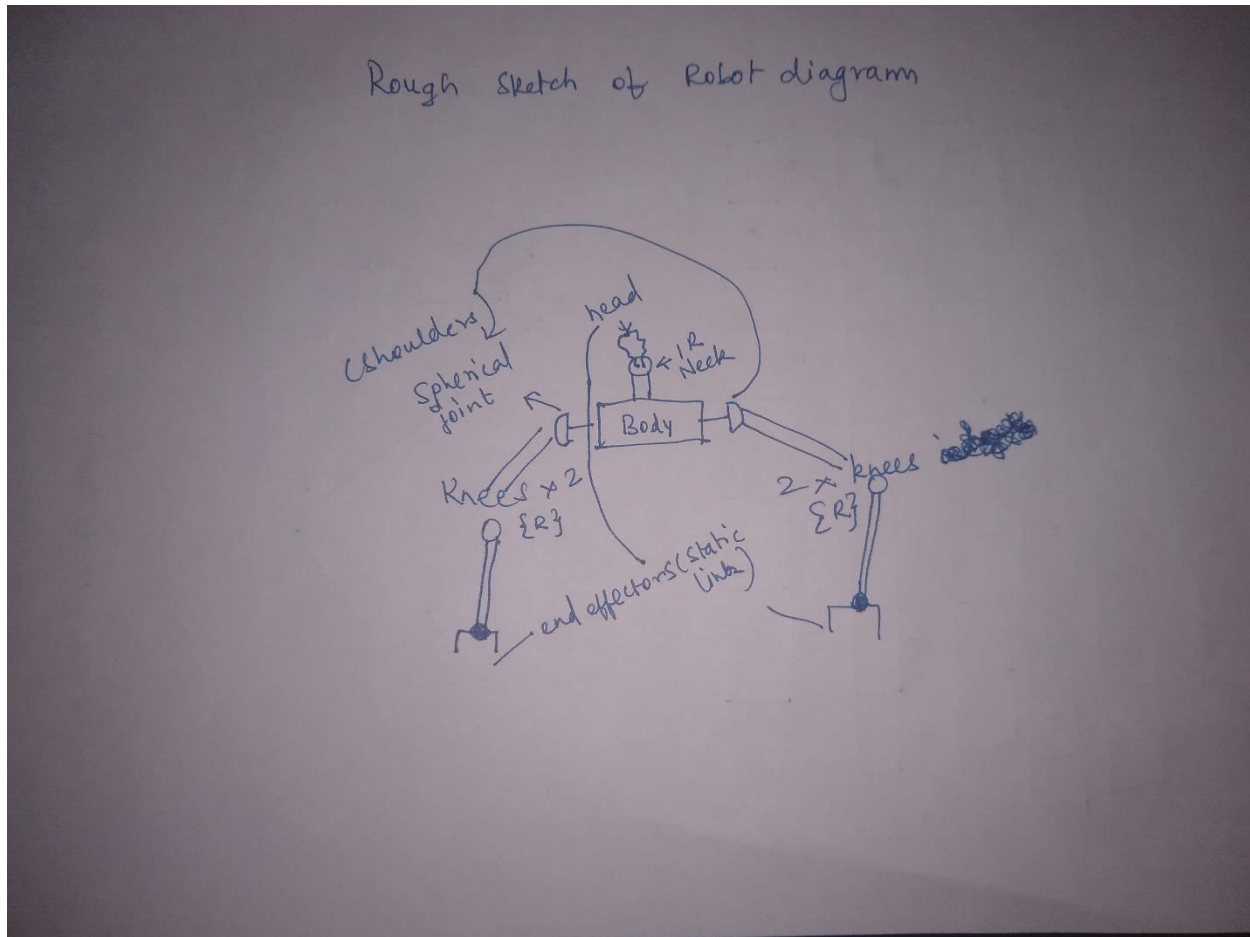
Note: If this is not very clear, here is what the robot would look like in a Boston Dynamic Video

https://www.youtube.com/watch?v=kHBcVlqpvZ8

Deliverables

- All the necessary packages to simulate the exact movement on another computer.

- A screenshot video of the actual simulation.

- A report documenting all necessary information.

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Milestones

Deadline	Milestone Achieved
April 12	Finish setting up the Visualization environment to be compatible with remote Python API and ROS
April 15	Finish Robot Creation
April 22 (Definitely)	Finish Adding flair to the robot. The robot will be able to move its arms and legs around at this time.
April 25 (Likely)	Try and provide more attributes and characteristics to the robot
April 27 (Ideally)	Make the robot do a Moonwalk
April 29	Final Project Submission Deadline

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