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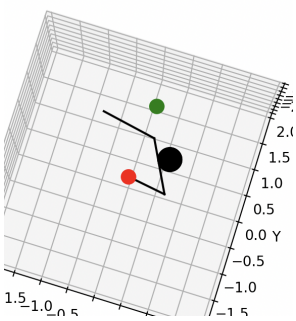
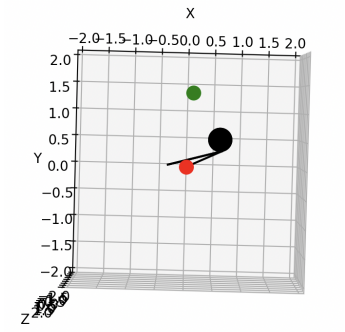
CSCI 545: Introduction to Robotics

After a certain radius size, which I found to be about 0.35, the model no longer is able to find a valid configuration to reach the goal position of the end-effector, since it just gets blocked. The arm appears that it could still reach if it went behind the obstacle, but that violates the bounds of the joint range of motion. When I decrease the radius to 0.1, the joint angles are much more even and the solution easily converges.

In the situation below, the first and second angles being higher and lower (respectively) than the provided configuration, the obstacle would "trap" the arm behind it, and there would be no solution.
If the starting point is too close to the obstacle, or within the obstacle, there is almost always no solution, since we're already touching the sphere.



The second joint angle could not be too small either, or this situation would occur:



Other configurations that yielded no solution:
Q3 < 1
Q1 > 0.7
Q2 > 1.5