

Robot Practical Course Assignment #1

This assignment is supposed to familiarize yourself with the TAMS Robot Simulator (TARSim) project for Unity3D after a short introduction.

Task 1.1 Launch Unity3D Project:

1.1.1: Copy the project into your home folder and extract it. Open a shell and enter

```
wget http://tams.informatik.uni-hamburg.de/lectures/2017ss/vorlesung/itr/rpc/RPC_A1.tar.gz
tar xvf RPC_A1.tar.gz
```

1.1.2: Launch Unity3D from the program menu (Super-Key). Open the RPC.Assignment_1 folder from the welcome screen of Unity3D.

Task 1.2 Run the Demo scene: Run the Demo scene (Project → Assets → Demo → Demo). For each of the KUKA LBR manipulators, select either the Javascript (JS) or the C# (CS) script and run the Demo scene.

Describe the differences between the motions to your supervisor.

Task 1.3 Circular Motion: Open the Assignment 1 scene. Select the 2dofplanar element and attach either the Javascript or the C# script. Open the script in your favorite editor (e.g.)

```
vim ~/RPC_Assignment_1/Assets/Assignments/Assignment\ 1/Assignment_One_JS.js
```

Check the online API for available functions

<https://tams.informatik.uni-hamburg.de/lectures/2017ss/vorlesung/itr/rpc/RPC-API.html>

Use the Unity3D scripting reference for your code

<https://docs.unity3d.com/ScriptReference/>

1.3.1: The script is currently empty except for the required initialization. Use the IKSolver to make the robot perform a circular motion in the quadrant span by the negative X-axis and the negative Z-axis. The Update function is the main loop, the Awake function is the initialization. To print debug info, use `Debug.Log(<text>);` and open the console by clicking in the bottom left corner of Unity3D.

1.3.2: Set the motion type for both joints from Instantaneous to Realistic

```
Joint.SetMotionType(MotionType.Realistic)
```

Explain your observations and suggest improvements which will solve the observed issue.

1.3.3: Reset the motion type to Instantaneous. Adapt your script to perform a circular motion with radius 0.8 around $-0.5, 0, 0.5$. Describe what you observe and try to explain it to a supervisor. Also test your script with the Realistic motion type.