

Worksheet: L14 – Sampling-based Motion Planning

CSCI-534: Robot Planning & Manipulation

Spring 2020

<http://www.neil.dantam.name/rpm/B14-samp.pdf>

1. **Distance Metric:** Define a distance metric for Euclidean Transformations using:

(a) Dual Quaternions: $\rho(h_1 + d_1\varepsilon, h_2 + d_2\varepsilon)$

(b) Transformation Matrices: $\rho\left(\begin{bmatrix} \mathbf{R}_1 & \mathbf{v}_1 \\ \mathbf{0} & \mathbf{1} \end{bmatrix}, \begin{bmatrix} \mathbf{R}_2 & \mathbf{v}_2 \\ \mathbf{0} & \mathbf{1} \end{bmatrix}\right)$

2. **Rapidly-Exploring Random Trees:** Extend the RRT. Use (1.2,1.2) and (1.5,.3) as the next random points.

