3D Path Planning: Pruning with Constraint Satisfaction (7A)

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RRT(Rapidly exploring Random Trees) is an algorithm to search a space by randomly building a space-filling tree. The tree is constucted by randomly selecting samples and biased to grow in large unsearched areas.

A* algorithm is a graph traversal algorithm,i.e it gives a path between 2 nodes. It uses heuristics to guide it's search which makes it better than Dijkstra's algorithm.

RRT-A* is an algorithm where we take the cost function of A* to determine selection of nodes in the RRT algorithm. This algorithm has resulted in a much faster search algorithm (approximately 10x times faster than RRT). So we have implemented RRT-A* as we will be using this as a search algorithm between start and end points.

References

[1] Steven M. LaValle (1998). Rapidly-Exploring Randm Trees: A new tool for Path Planning
`http://msl.cs.illinois.edu/ lavalle/papers/Lav98c.pdf`

[2] Jiadong Li et al. (2014). RRT-A* Motion Planning Algorithm for Nonholonomic Mobile Robot
`https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=arnumber=6935304`