

CS354

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- Let's do an example...

Evaluating Planning Algorithms

- We prefer algorithms that are
 - Complete - Guaranteed to find a path if one exists
 - Optimal - Guaranteed to find the lowest-cost path
 - Efficient
 - Easy to implement

RRT Evaluation

- Efficiently “covers” the search space:
 - Argument based on **Voronoi diagrams**
- Asymptotically Complete - Guaranteed to find a path given infinite time
- Easy to implement
- **not optimal** - May never find the optimal path

RRT Alternatives

- A* and variants (Too slow for high-dimensional problems)
- RRT variants
 - e.g. RRT* is *asymptotically optimal*
- Probabalistic Roadmap and variants
 - Creates a randomized graph that can be used for multiple queries
 - Less convenient for non-holonomic problems

Planning in ROS

- **Movel!** - ROS system for mobile manipulation
- **Open Motion Planning Library (OMPL)** - Used by Movel! for planning
- OMPL provides *many planning algorithms*