

# CS365 Project

## Instructional Suite for motion planning of articulated Robots with multiple links and polygonal obstacles

Advisor : Dr. Amitabha Mukerjee

### Group Members

Lalit Kumar(10368)

Rajiv Krishna Omar(10577)



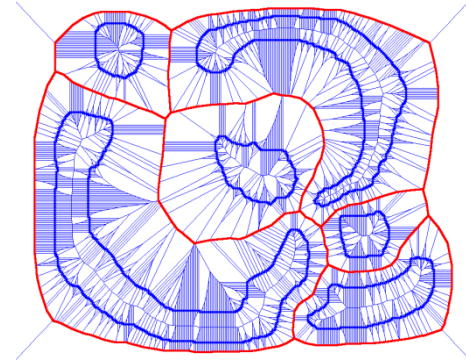
## An Overview

- **Collision free path finding** - frequently encountered problem in **motion planning**.
  
- **Several methods** for finding collision free path planning.
  - Probabilistic
  - Deterministic

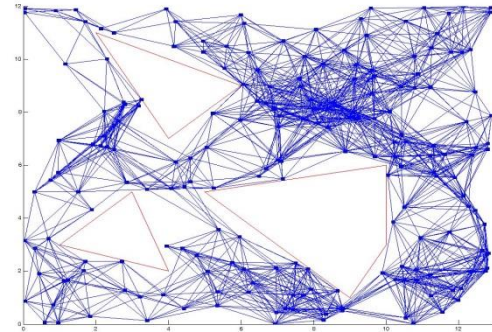
# Methods widely used



- **Generalized Voronoi Graph**



- **Probabilistic Roadmap Method**



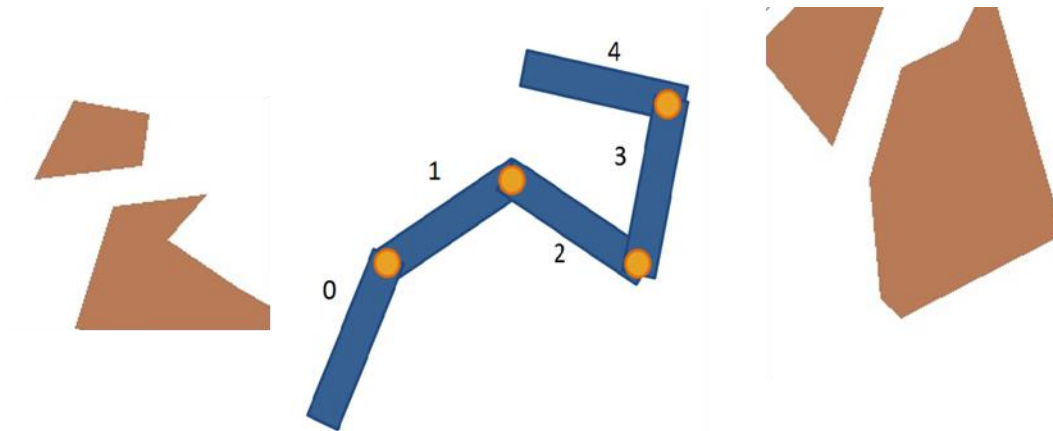
- **RRT (Rapidly-exploring Random Trees)**





To develop a robot motion planning suite for hyper-redundant planar articulated robots

- Graphical interactive interface for input/output
- Polygonal obstacles
- Three different algorithms for path planning
- Bulk mode input/output also possible

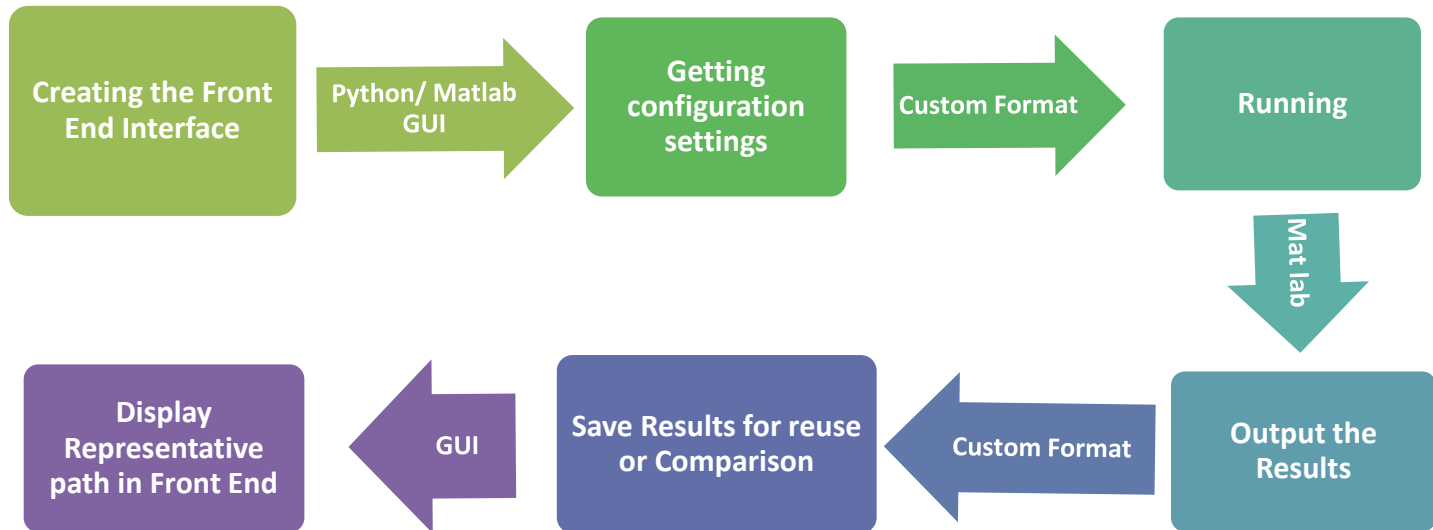




- ✓ Use for **Instructional purpose**
- ✓ Creating **data with high dimensionality** for later use
- ✓ **Comparison of the methods**
- ✓ **Visualization of path** computed using different algorithms



# Development Process





## References:

- Probabilistic roadmaps for path planning in high-dimensional configuration spaces by LE Kavraki, P Svestka, JC Latombe
- Principles of Robot Motion-Theory, Algorithms and Implementation by Howie choset
- Notes by Choset <http://www.cs.cmu.edu/~motionplanning/lecture/>
- Rapidly-Exploring Random Trees A New Tool for Path Planning by SM LaValle
- Motion planning in a plane using generalized Voronoi diagrams by O Takahashi, RJ Schilling
- REACH BASED SYNTHESIS OF MODULAR HYPER-REDUNDANT MANIPULATORS by Kaushik Sinha
- <http://web.engr.oregonstate.edu/~sinisa/images/research/VoronoiDiag.png>
- <http://nugzine.files.wordpress.com/2011/08/testing1.jpg>
- [http://en.wikipedia.org/wiki/File:RRT\\_graph1.png](http://en.wikipedia.org/wiki/File:RRT_graph1.png)

Thank You!

