

# EE183DA Lab 4 – Rapidly Exploring Random Tree

## Problem Description



## Trajectory Planning

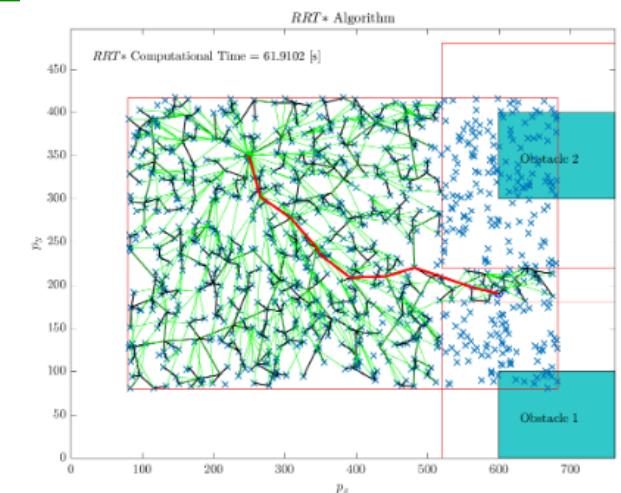
Algorithm 2: Pseudo Code for RRT\* Algorithm [1][3]

### INITIALIZATION

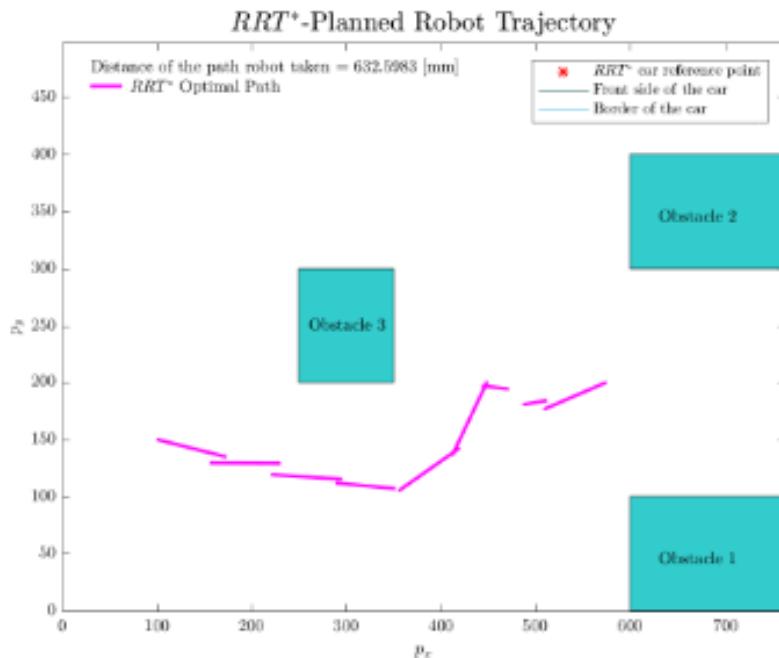
```
V = {xi} ; // Initialize V = Add xi to V  
E = {} ; // Initialize E = {}  
T = (V, E) ; // Tree = (Vertices,Edges)
```

### RRT\* ALGORITHM

```
while x ≠ xf do  
    for i = 0 to i = N do  
        xrand ← Sample(x) ; // Sample ∈ C  
        xnearest ← Nearest (V, xrand) ; // Closest x ∈ V  
        xnew ← Drive (xnearest, xrand) ; // Drive from xnearest to xrand  
        if No Collision then  
            xnear ← Near (V, xnew, |E|) ; // Return nearby x ∈ V  
            xmin ← SelectParent (xnear, xnearest, xnew) ; // Select best parent  
            xnew ∈ xnear  
            InsertNode (xmin, xnew, V) ; // Add xnew to V  
            InsertEdge (pxmin, pxnew, E) ; // Add pxnew to E  
            T ← Rewire (T, xnear, xmin, xnew) ; // Rewire the tree  
    return T
```



## Matlab Implementation



## Robot Implementation

