Bidirectional Sampling-Based Motion Planning

In [5]:
```
# The autoreload extension will automatically load in new code as you
edit files,
# so you don't need to restart the kernel every time
%load_ext autoreload
%autoreload 2

import numpy as np
import matplotlib.pyplot as plt
from P2_rrt import *
from P4_bidirectional_rrt import *

plt.rcParams['figure.figsize'] = [7, 7] # Change default figure size
```

```
The autoreload extension is already loaded. To reload it, use:
  %reload_ext autoreload
```

Set up workspace

In [6]:
```
MAZE = np.array([
    (( 5, 5), (-5, 5)),
    ((-5, 5), (-5,-5)),
    ((-5,-5), ( 5,-5)),
    (( 5,-5), ( 5, 5)),
    ((-5, 2), (-1, 2)),
    ((-1, 2), (-1,-1)),
    (( 0, 2), ( 0,-1)),
    (( 0, 2), ( 5, 2))
])
```

Normal RRT

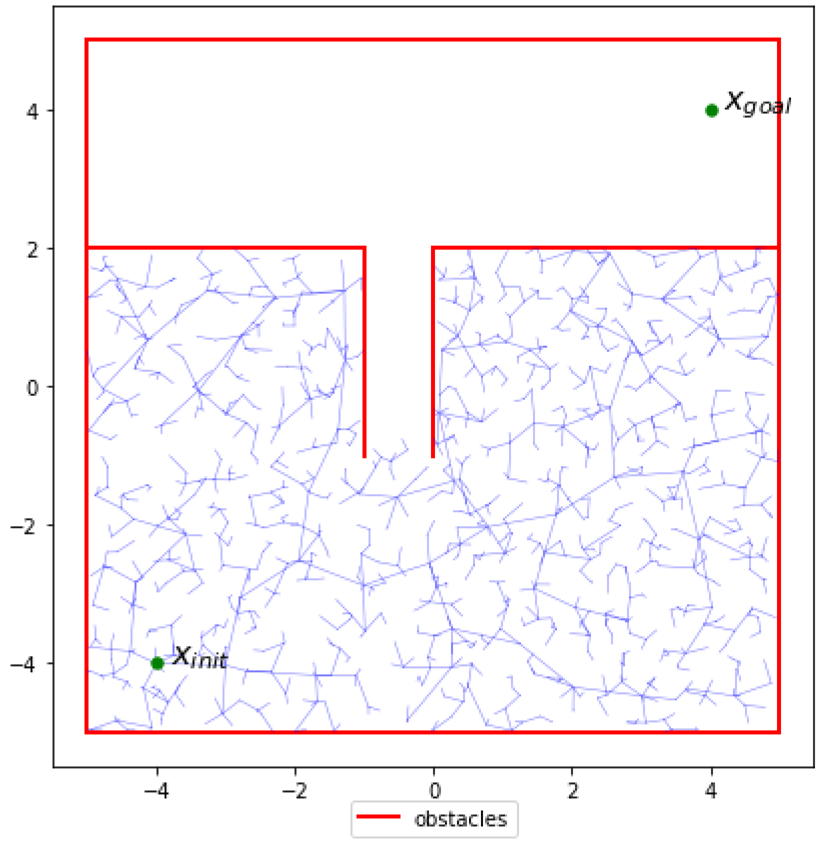
On this "bugtrap" problem, normal RRT often will fail to find a find a path.

Geometric planning

```
In [7]: grrt = GeometricRRT([-5,-5], [5,5], [-4,-4], [4,4], MAZE)
        grrt.solve(1.0, 2000)
```

```
Solution not found!
```

```
Out[7]: False
```

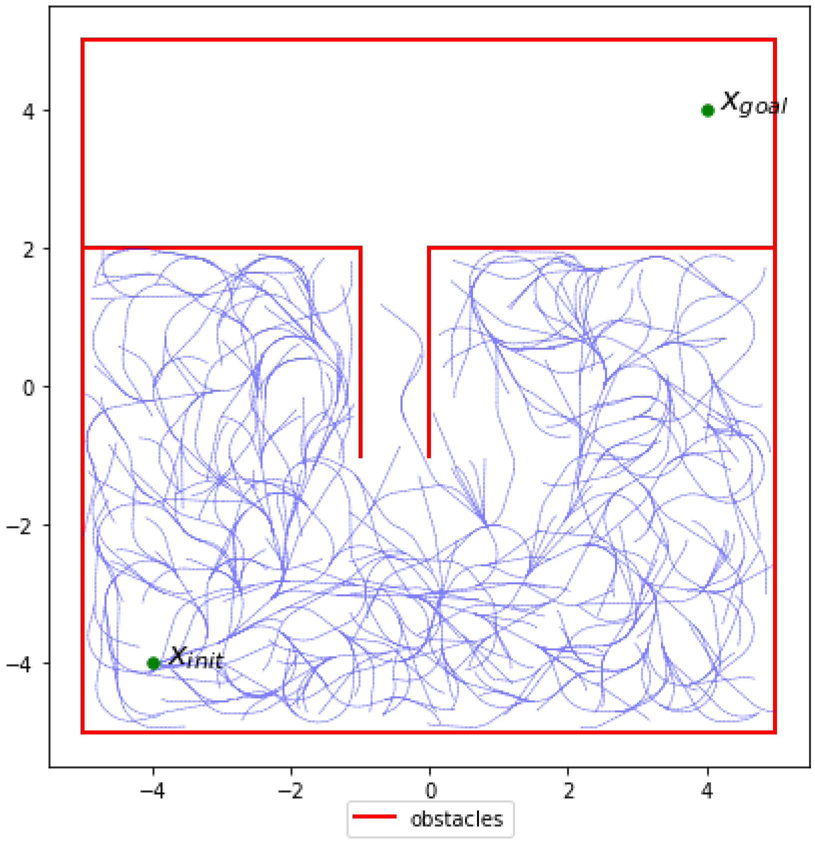


Dubins car planning

In [8]:
```
drrt = DubinsRRT([-5,-5,0], [5,5,2*np.pi], [-4,-4,0], [4,4,np.pi/2],
MAZE, .5)
drrt.solve(1.0, 1000)
```

```
Solution not found!
```

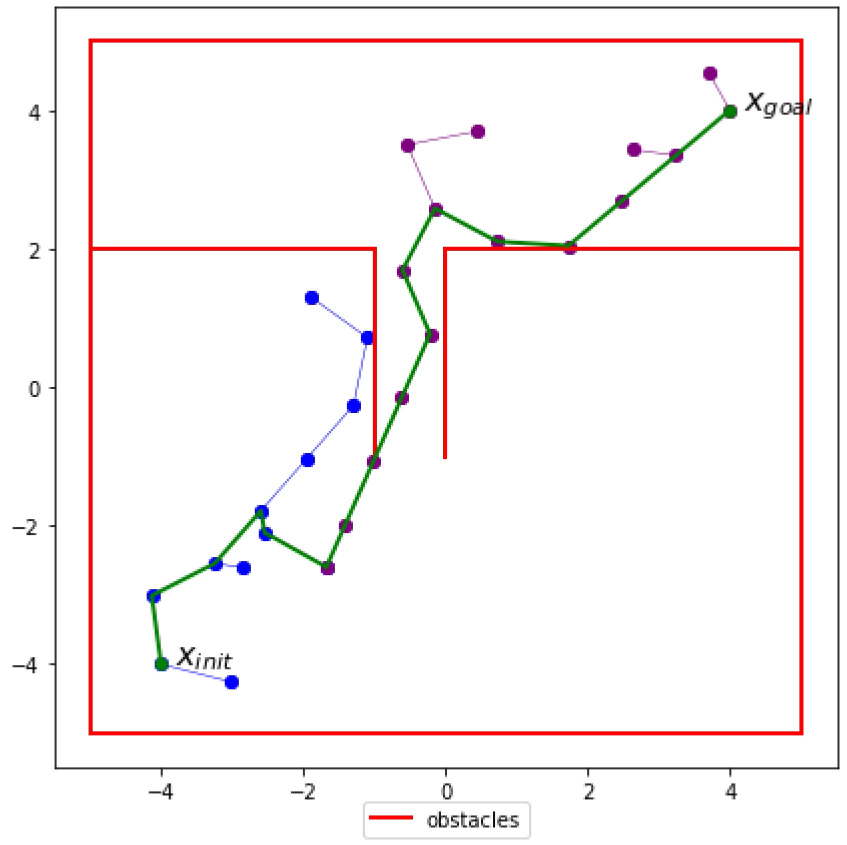
Out[8]:
```
False
```



RRTConnect

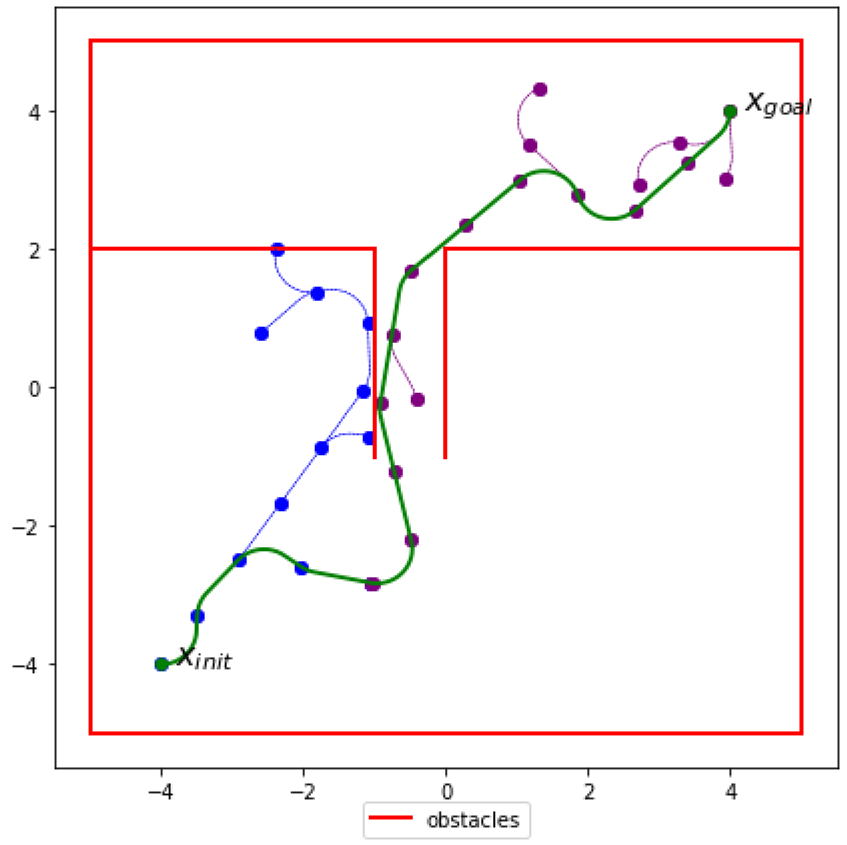
Geometric planning

In [11]:
```
grrt = GeometricRRTConnect([-5,-5], [5,5], [-4,-4], [4,4], MAZE)
grrt.solve(1.0, 2000)
```



Dubins car planning

In [14]:
```
drrt = DubinsRRTConnect([-5,-5,0], [5,5,2*np.pi], [-4,-4,0], [4,4,np.
pi/2], MAZE, .5)
drrt.solve(1.0, 1000)
```



In [ ]: