A* Motion Planning

In [21]:

```
# 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 P1_astar import DetOccupancyGrid2D, AStar
from utils import generate_planning_problem
```

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

Simple Environment

Workspace

(Try changing this and see what happens)

In [27]:

```
width = 10
height = 10
obstacles = [((6,7),(8,8)),((2,2),(4,3)),((2,5),(4,7)),((6,3),(8,5))]
occupancy = DetOccupancyGrid2D(width, height, obstacles)
```

Starting and final positions

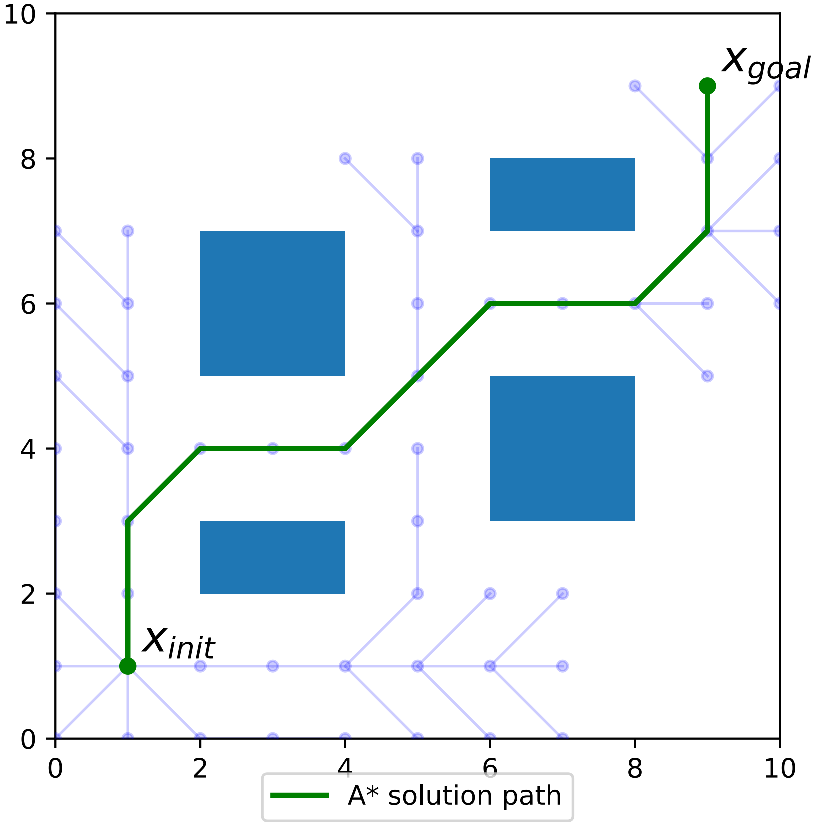
(Try changing these and see what happens)

In [28]:

```
x_init = (1, 1)
x_goal = (9, 9)
```

Run A* planning

In [29]:
```
astar = AStar((0, 0), (width, height), x_init, x_goal, occupancy)
if not astar.solve():
    print "No path found"
else:
    plt.rcParams['figure.figsize'] = [5, 5]
    astar.plot_path()
    astar.plot_tree()
```



Random Cluttered Environment

Generate workspace, start and goal positions

(Try changing these and see what happens)

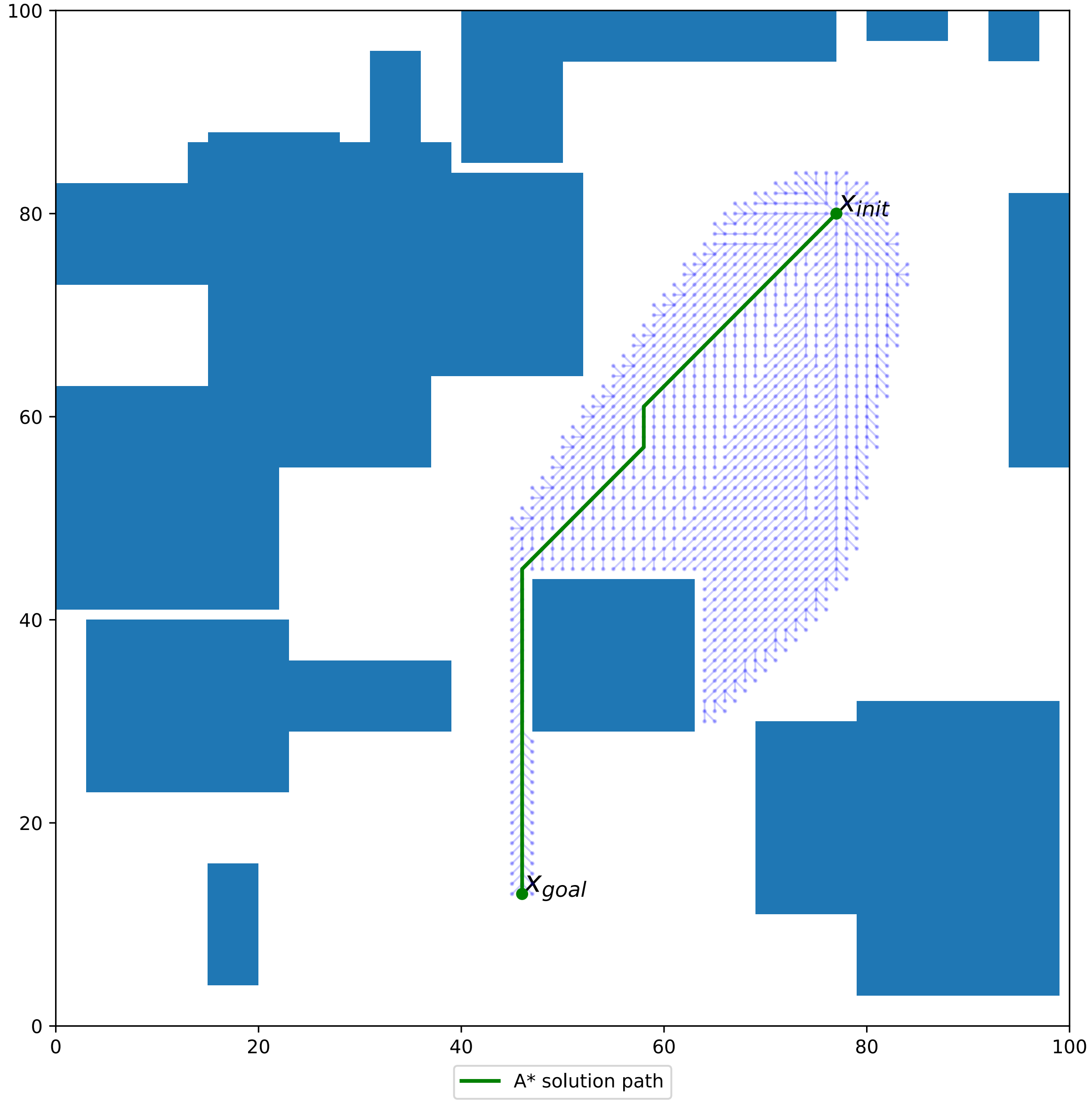
In [32]:
```
width = 100
height = 100
num_obs = 25
min_size = 5
max_size = 30

occupancy, x_init, x_goal = generate_planning_problem(width, height,
num_obs, min_size, max_size)
```

Run A* planning

In [33]:

```
astar = AStar((0, 0), (width, height), x_init, x_goal, occupancy)
if not astar.solve():
    print "No path found"
else:
    plt.rcParams['figure.figsize'] = [10, 10]
    astar.plot_path()
    astar.plot_tree(point_size=2)
```



In [ ]: