Notes on Probabilistic Roadmap Method with Randomized Bridge Builder
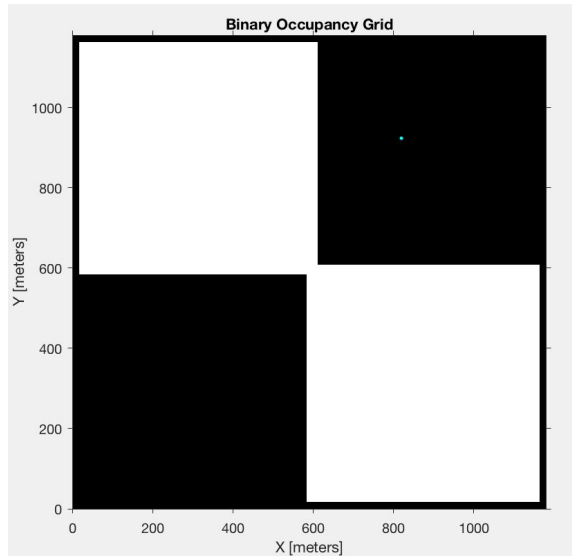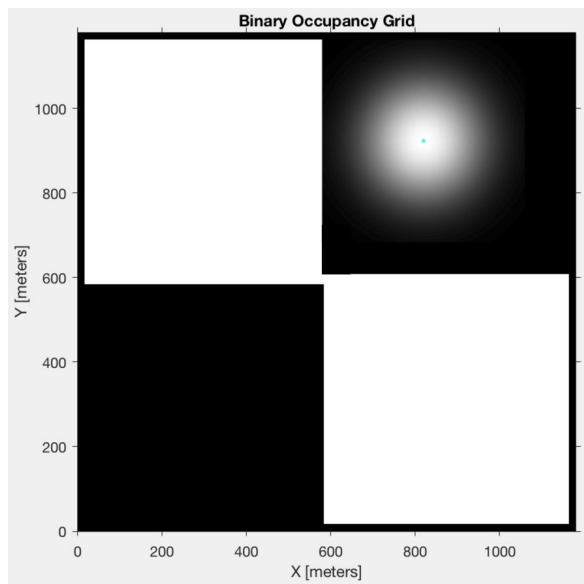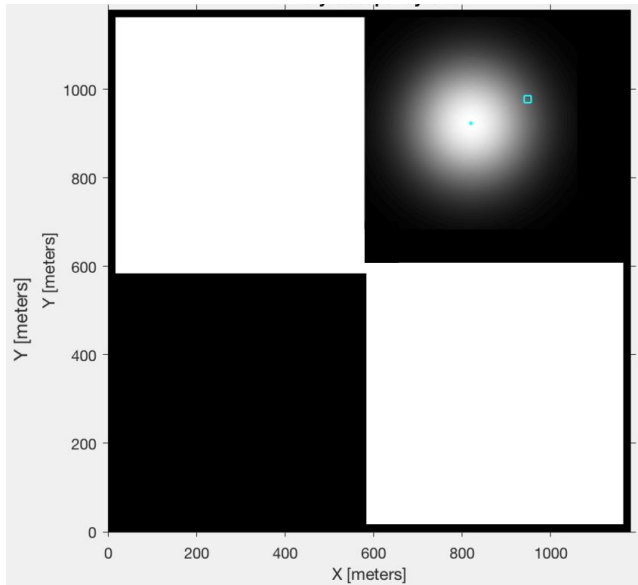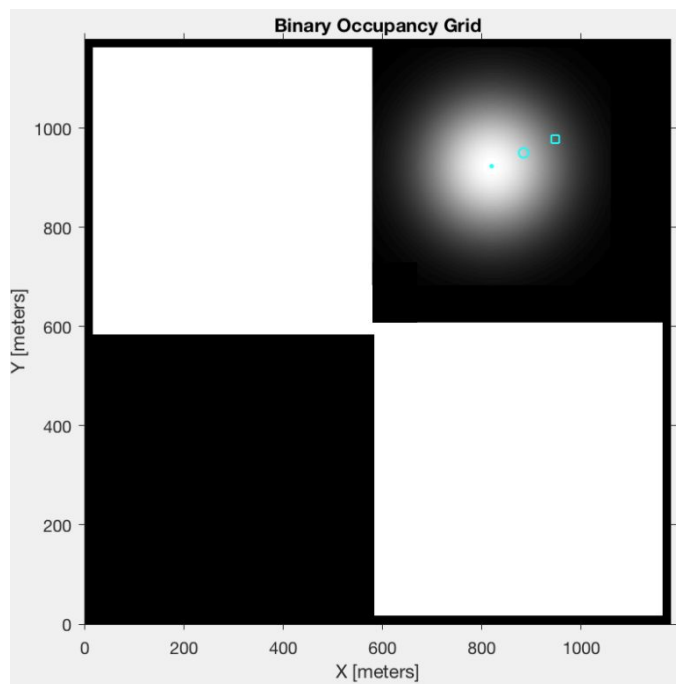
Select a random point X

PDF radial gaussian centered in point X gaussian with standard deviation D1,D2.
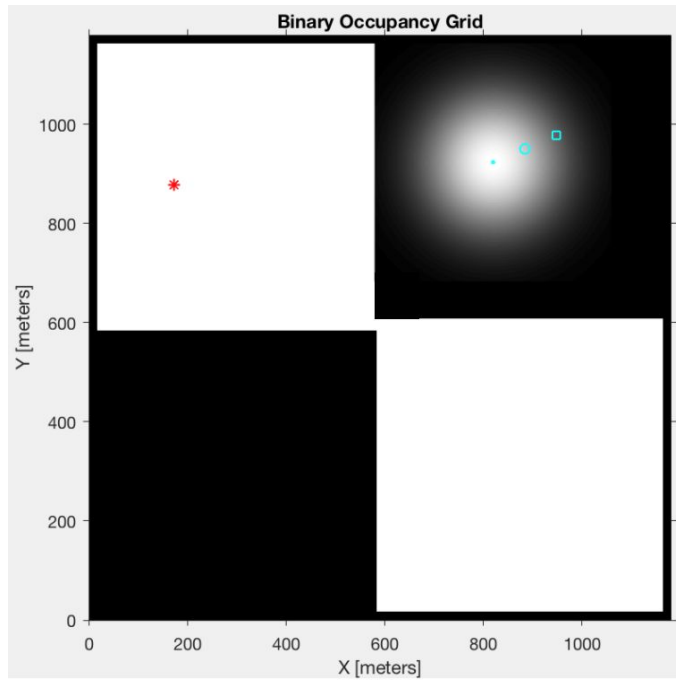

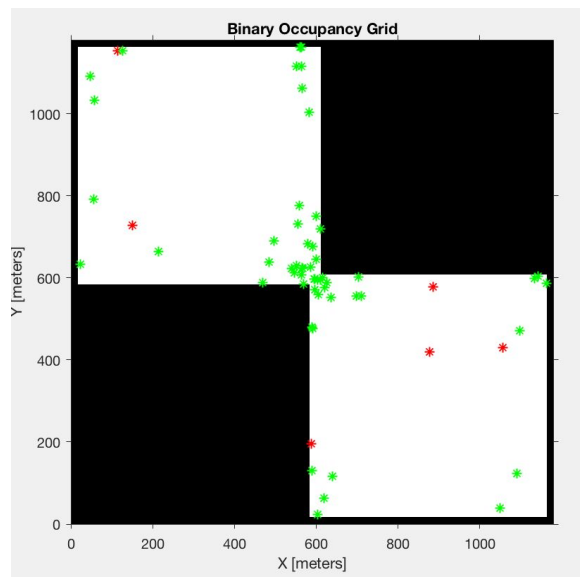Select a random point based on PDF. Marker: square

If the random point is in a occupied zone, find a midpoint. Marker: circle. If the midpoint is in a non-occupied zone, it becomes a milestones. On the other hand, if the midpoint is in a occupied zone, it is discarded.
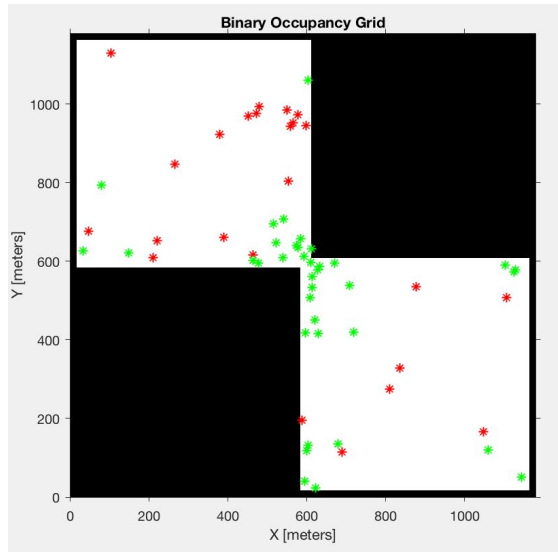

Select a random point X . if the point is in a non-occupied zone, it is set as a milestone. X-->G. Marker: red *

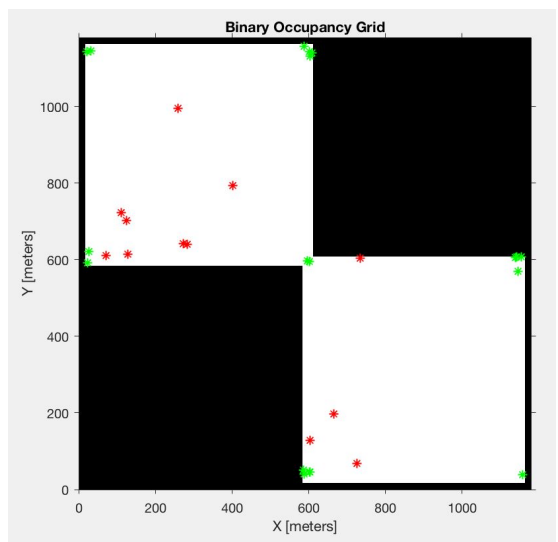Binary Occupancy Grid

Milestones. Red from uniform distribution. Green from bridge method

Binary Occupancy Grid

SD=200 N=60 w=0.9

Binary Occupancy Grid

SD=200 N=60 w=0.6

Binary Occupancy Grid

SD=50 N=30 w=0.6

Binary Occupancy Grid
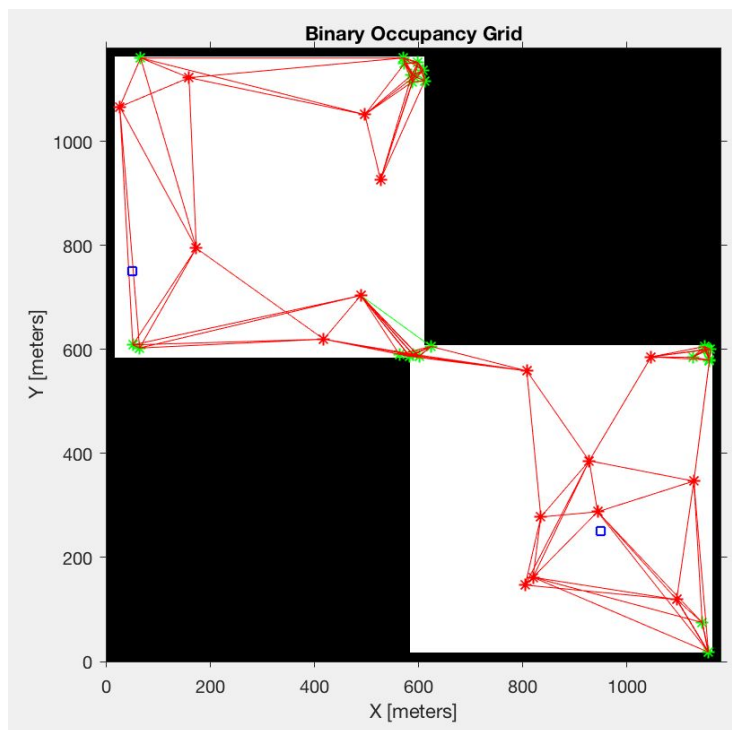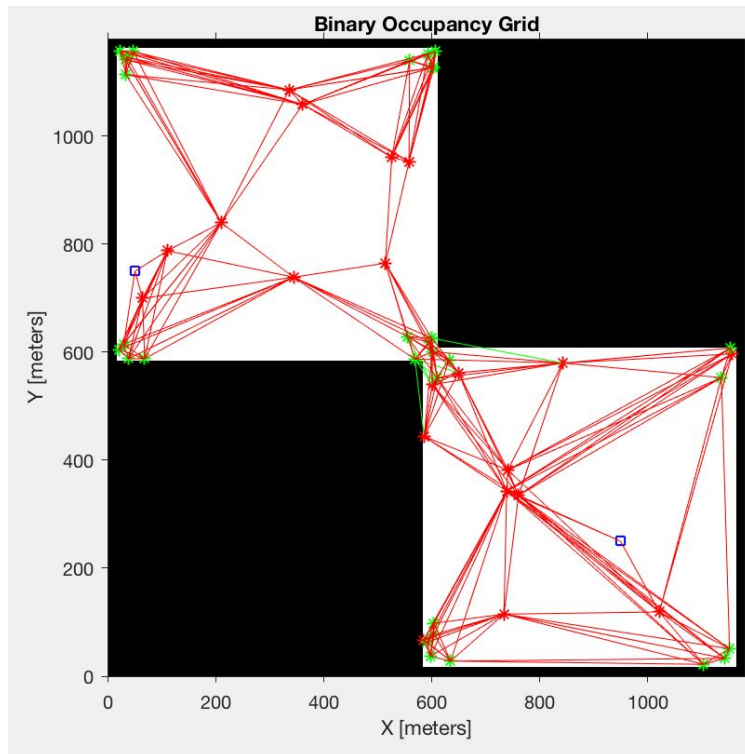
SD=50 N=30 w=0.9
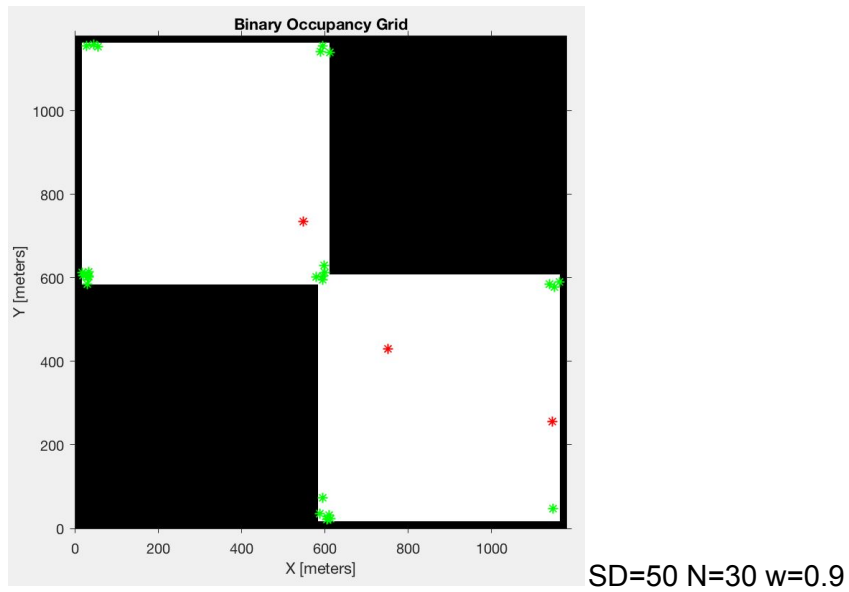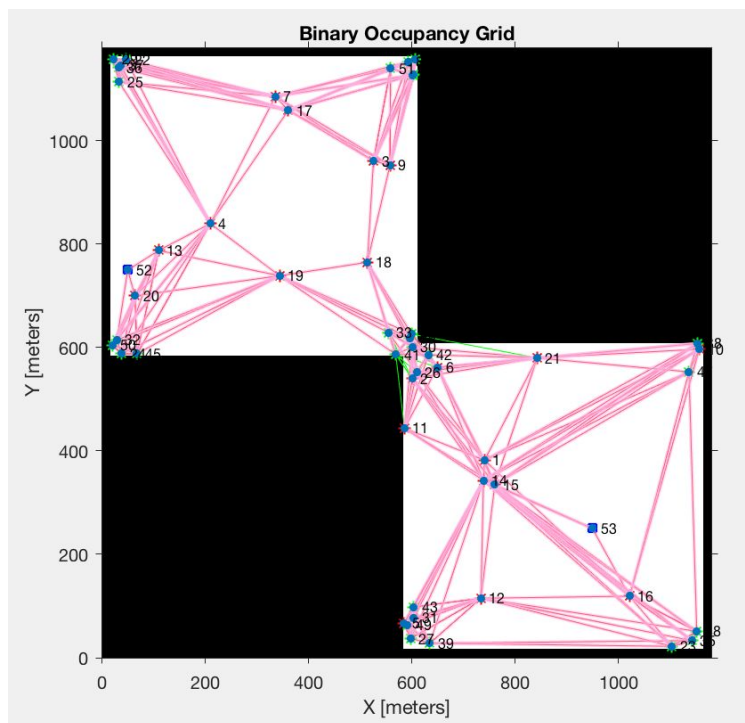
Connect the milestones in a connectivity graph. The edges that intersect the occupied area are set in green and will be discarded.

Binary Occupancy Grid

Connect the Start and End point to the connected graph using the KNN. K=3

Binary Occupancy Grid

Label the nodes.

Binary Occupancy Grid

Find a path from Start to End point. (The algorithm finds any possible path, it does not find a shortest path. In order to find the shortest path, the weighted adjacency matrix should be used instead of a binary adjacency matrix. The weights represent the distance between two nodes.)

Binary Occupancy Grid