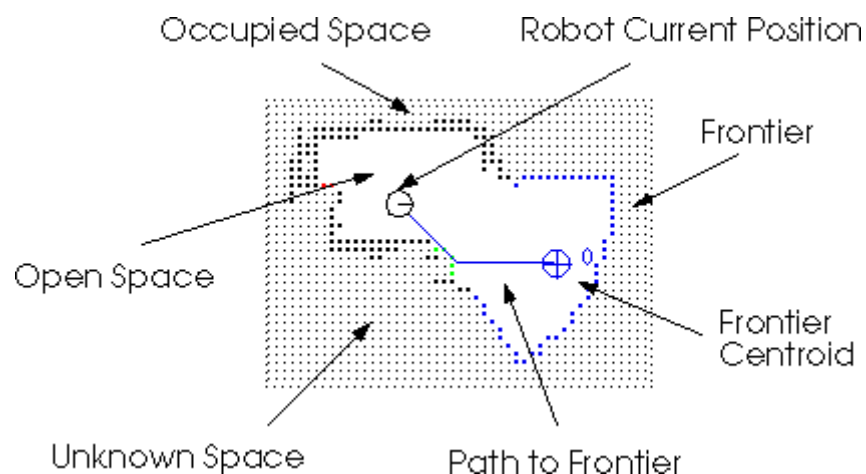
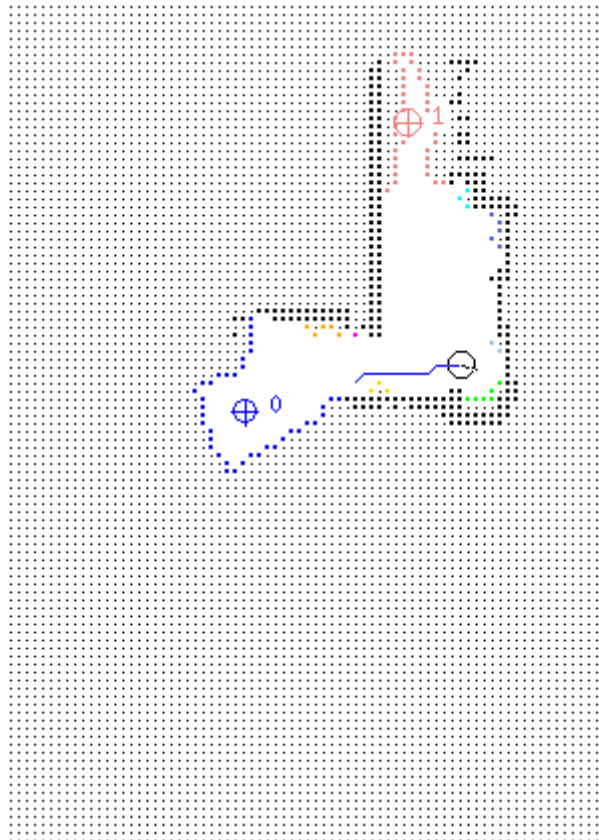


Real-World Experiments



[Frontier-Based Exploration Video](#) (10 MB)

Frontier-based exploration has been implemented on a Nomad 200 mobile robot. This robot has been able to successfully explore and navigate within a real-world office environment.

In the animation above, cells known to be unoccupied are represented by white space. Cells known to be occupied are represented by large dots. Cells with unknown occupancy probability are represented by small dots. Cells on the boundary between unoccupied and unknown space are colored and grouped into contiguous frontier regions. All cells with

the same color belong to the same region. Regions that are sufficiently large are numbered, and crosshairs mark their centroids.

The blue line represents the path from the robot's current position (the black circle with a line indicating the robot's heading) to the nearest frontier. The robot attempts to follow this path, while navigating reactively around any unexpected obstacles.

The images show the evidence grids constructed, as the real robot explored an office cluttered with desks, chairs, bookshelves, cabinets, a large conference table, a sofa, and other obstacles. The robot starts in the hallway, then navigates through the doorway and explores throughout the office. When the robot finishes with the office, it navigates back through the doorway, to explore further down the hallway.

FRONTIER-BASED EXPLORATION

[RobotFrontier.com](http://robotfrontier.com)