

Navigation: Bug algorithms

Comparing the Bug Algorithms

Online vs. Offline

Bug algorithms are **online planning** algorithms.

- Planning and execution are interleaved. The robot decides what to do “on-the-fly”.
- Contrast to: **Offline planning**, in which the robot forms a complete plan before moving.

Comparison between Bug1 and Bug2

Which algorithm is more “aggressive”? Which one is “conservative”?

Which algorithm provides better worst-case performance?

- Bug1 searches **exhaustively** for the best leave point.
- Bug2 is **opportunistic**, choosing the first suitable leave point it finds.

What if the goal cannot be reached?

What happens if there is no path to reach the goal?

Both algorithms can detect this.

- Bug1: When the closest point on an obstacle to the goal leads to an immediate collision.
- Bug2: When a complete cycle is made without finding a new leave point.