Robotics:

11/13/2023…………………  
Dead reckoning Technique:

Dead reckoning is a navigation technique that involves estimating a current position based on a previously known position, course, and speed. This method is often used in various fields, including navigation at sea, in the air, and in land-based vehicles.

The dead reckoning algorithm calculates the present position by starting with a known position and then updating it based on the estimated speed and direction of travel over time. The term "dead reckoning" comes from "deduced reckoning," where "dead" is used in the sense of "lifeless" or "inert," indicating that it relies on previously determined data without direct observation of the current position.

The algorithm typically involves the following steps:

1. \*\*Initial Position:\*\* Start with a known position (latitude and longitude, for example).

2. \*\*Course:\*\* Determine the direction or course of travel (measured in degrees from the reference direction, usually north).

3. \*\*Speed:\*\* Estimate the speed of travel.

4. \*\*Time:\*\* Multiply the speed by the time elapsed to calculate the distance traveled.

5. \*\*Update Position:\*\* Update the initial position based on the calculated distance and course.

Mathematically, the new latitude and longitude can be calculated using trigonometry and geometry based on the initial position, course, and distance traveled. However, it's important to note that dead reckoning is subject to cumulative errors over time, as it doesn't account for external factors such as wind, currents, or variations in speed.

In modern applications, dead reckoning is often used in combination with other navigation methods, such as GPS (Global Positioning System), to improve accuracy and reduce cumulative errors. GPS provides a more accurate and absolute position, while dead reckoning can help maintain continuity of navigation when GPS signals are temporarily unavailable or unreliable. This combined approach is known as integrated navigation or sensor fusion.