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BROWNIAN MOTION OF A RASPBERRY PI CONTROLLED ROBOT

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Brownian Motion of a Raspberry PI Controlled Robot

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ABSTRACT

Brownian motion is defined as the random movement of small particles as they interact and bounce off of one another. We now know that this type of particle motion can be compared to The Drunkards Walk. The idea behind this is that the random movements of the particle over a certain amount of time will have a Gaussian distribution centered at zero. While this has been proven thoroughly over the years, the purpose of my experiment is to demonstrate it once again with the use of a PiBorg robot controlled by a Raspberry Pi computer. The movements of the robot are programmed with a random number generator. The random numbers are then translated into linear motion thus giving the car the Drunkards Walk. As the car moves, each stop is recorded and graphed to show that the input box distribution leads to an output Gaussian distribution. This demonstrates the implementation of Brownian motion using robotics.

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