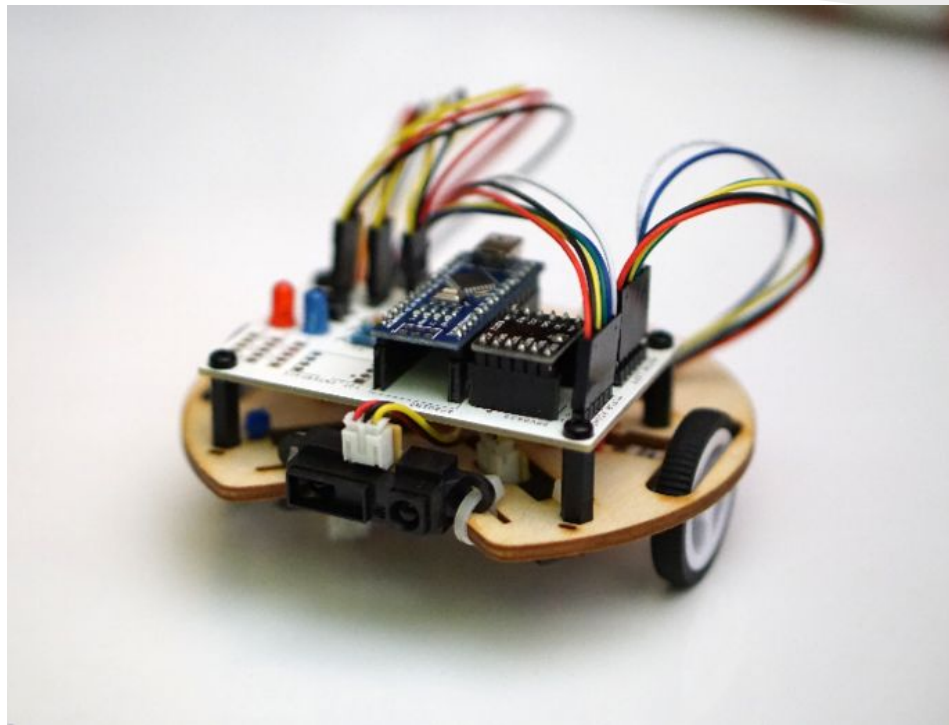


IEEE Micromouse DeCal

Week 4

Micromouse Hardware Kit



Odometry

- What's an odometer?
- Why do we care?



Odometry

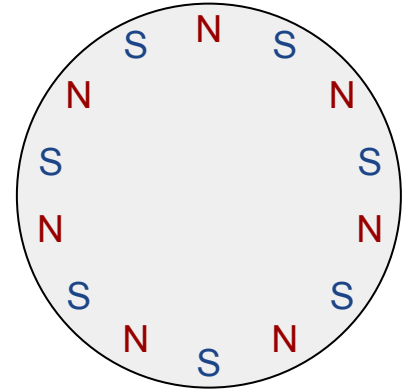
“Use of data from motion sensors to estimate change in position over time.” - Ol’ Wiki

- How do we find the velocity of our micromouse?

Midterm season, Responsibilities



- What about distance if velocity is known?



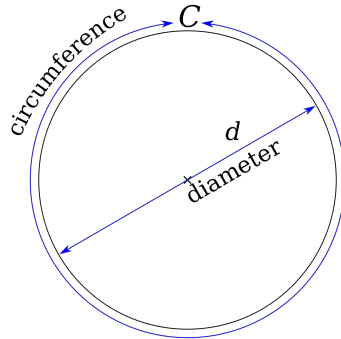
Review: Odometry for each Motor

How we are calculating velocity for each wheel:

(distance) / (change in time)

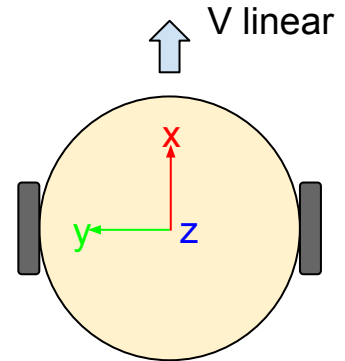
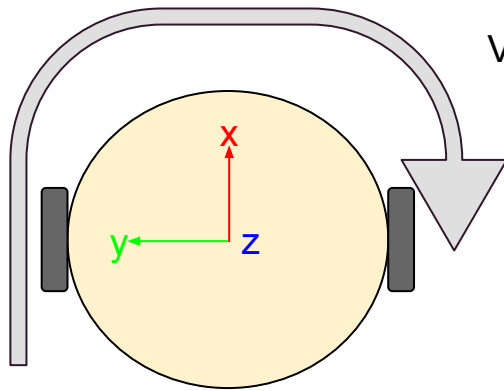
((# of revolutions) x wheel circumference) / (change in time)

((Encoder ticks / ticks per revolution) x wheel circumference) / (change in time)



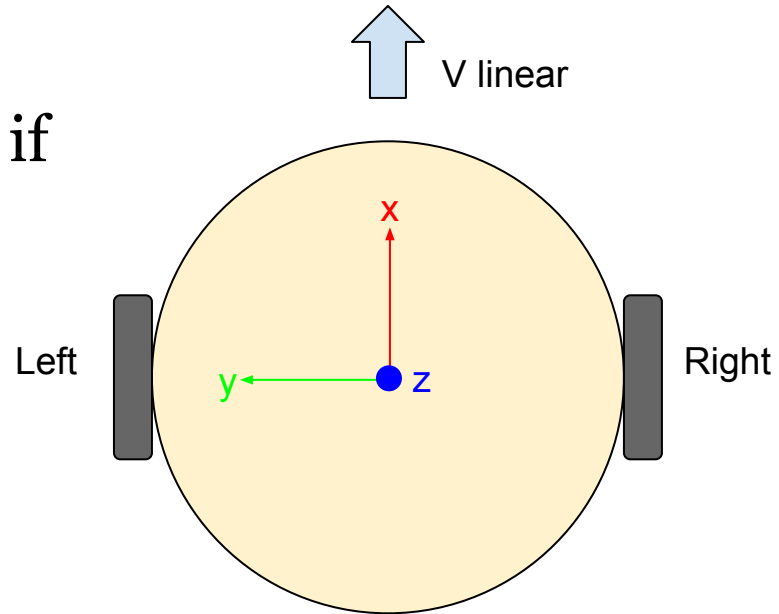
Mouse Velocities

- With the known velocities of each motor we can find the linear velocity and angular velocity of the mouse.



Linear Velocity of Mouse

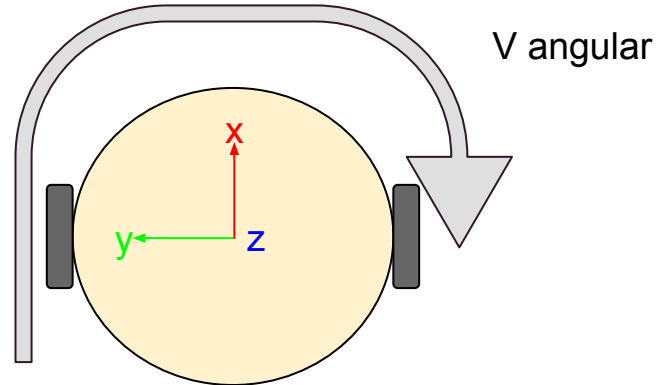
- $V_{\text{linear}} = (V_{\text{left}} + V_{\text{right}}) / 2$
- What's the mouse linear velocity if $V_{\text{left}} = V$ and $V_{\text{right}} = V$?
- What's the mouse linear velocity if $V_{\text{left}} = V$ and $V_{\text{right}} = -V$?



Angular Velocity

- $V_{\text{angular}} = (V_{\text{right}} - V_{\text{left}}) / d$
- What's the angular velocity if $V_{\text{left}} = V$ and $V_{\text{right}} = V$?
- What's the angular velocity if $V_{\text{left}} = V$ and $V_{\text{right}} = -V$?

* d = diameter between the two wheels



Linear and Angular Velocity

- What is the linear and angular velocity when...
 - The mouse is going straight?
 - The mouse is turning in place?
- Is knowing the linear and angular velocity important for solving a maze?

Questions?

