

Recommended Assessment

Forward Kinematics

1. In comparison to controlling the QBot with body speeds (Differential/Arcade drive), what benefits and limitations does controlling individual wheel speeds (Tank drive) have?
2. What challenges did you face commanding line following using only downward facing camera feed? What strategies did you use to overcome them?
3. Provide the expressions for the forward speed (v_c) and turn speed (ω) in terms of left and right wheel speeds (ω_L & ω_R)?
4. Verify that your observations from what wheel speeds lead to forward and turn speeds for the body are consistent with the equations from question 3.
5. The turn body speed was compared to the gyroscopic yaw rate in one of the scopes. How well did the two measurements track with respect to each other? Why was the forward body speed not compared to any other signal? Are there other sensors that can corroborate this measurement?