Skycam

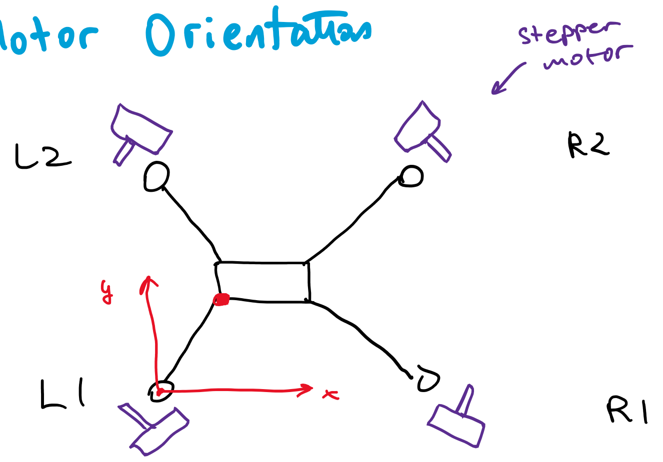
Thursday, March 13, 2025 10:35

TODO

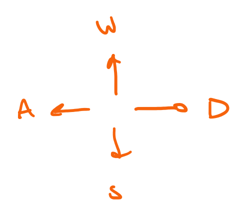
- Double check motor rotation direction mapping

Definitions

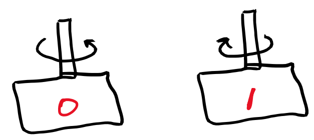
Motor Orientation



WASD



Rotating Direction

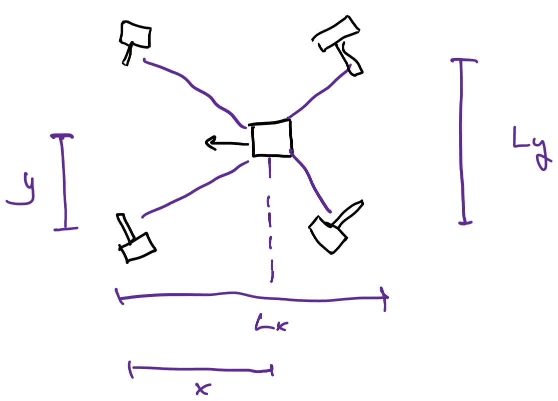


counterclockwise = 0

clockwise = 1

Calculations

Going left (A)



L1 : $\sqrt{x^2 + y^2}$

L2 : $\sqrt{x^2 + (L_y - y)^2}$

R1 : $\sqrt{(L_x - x)^2 + y^2}$

R2 : $\sqrt{(L_x - x)^2 + (L_y - y)^2}$

if $\frac{dx}{dt} = \alpha$,

the motor speeds are ...

$$\frac{\partial L_1}{\partial t} = \left(\frac{\partial L_1}{\partial x}\right)\left(\frac{\partial x}{\partial t}\right)^{(?)} = \frac{x}{\sqrt{x^2 + y^2}}$$

$$\frac{\partial L_2}{\partial t} = \cdots = \frac{x}{\sqrt{x^2 + (L_y - y)^2}}$$

$$\frac{\partial R_1}{\partial t} = \cdots = \frac{x - L_x}{\sqrt{(L_x - x)^2 + y^2}}$$

$$\frac{\partial R_2}{\partial t} = \cdots = \frac{x - L_x}{\sqrt{(L_x - x)^2 + (L_y - y)^2}}$$

Going from (x_0, y_0) to (x, y)

Appendix: Derivatives

↳ $$\frac{\partial \sqrt{(L-x)^2 + c}}{\partial x} = \frac{x - L}{\sqrt{(L-x)^2 + c}}$$

↳ $$\frac{\partial \sqrt{x^2 + c}}{\partial x} = \frac{x}{\sqrt{x^2 + c}}$$