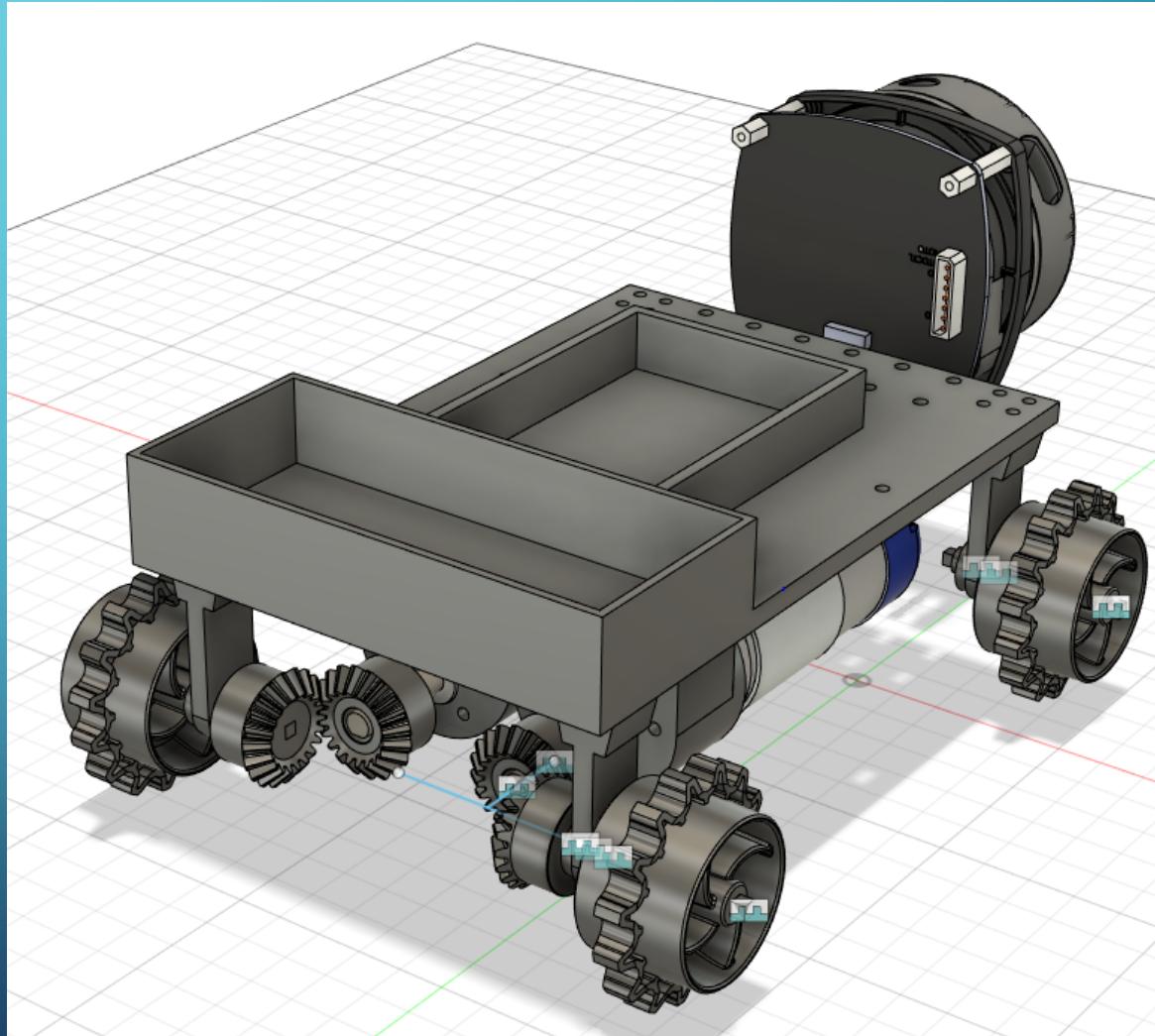
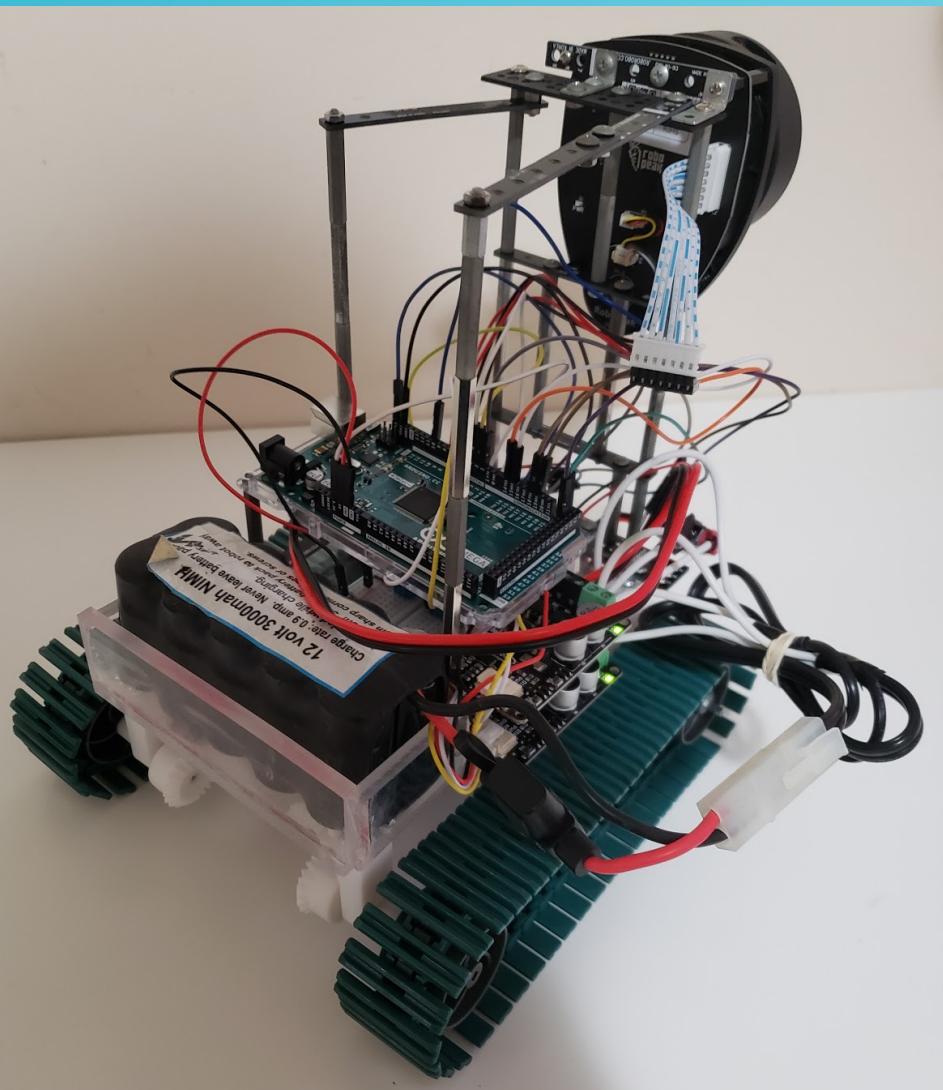


DISASTER SCENARIO RECONNAISSANCE AND MAPPING ROBOT

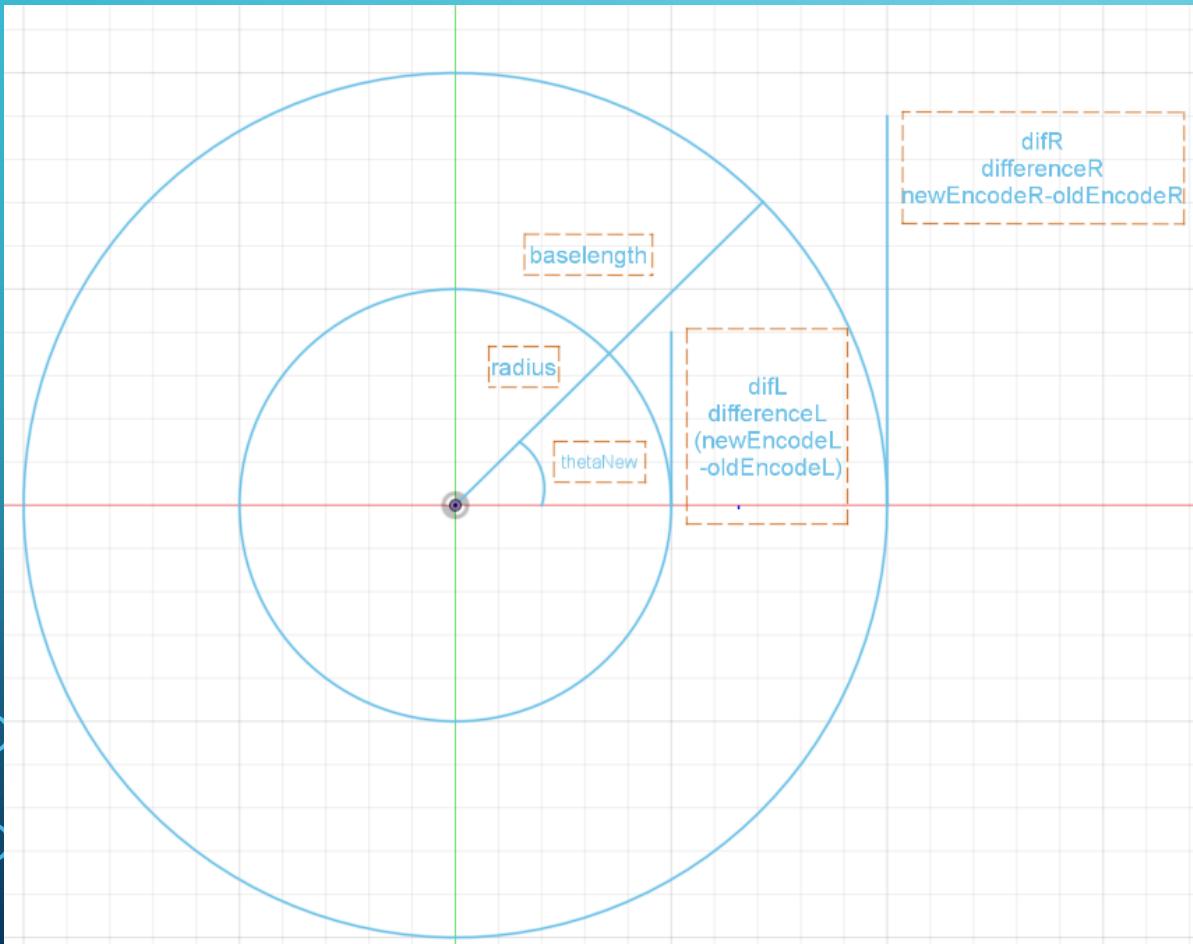
MATTHEW KIM

GWINNETT SCHOOL OF MATHEMATICS SCIENCE AND TECHNOLOGY

ROBOT



DERIVATION OF FORMULA



- $S = \theta_{new}r$
- $difR = \theta_{new}(r + baseLength)$
- $r = \frac{difR}{\theta_{new}} - baseLength$
- $difL = \theta_{new}r$
- $r = \frac{difL}{\theta_{new}}$

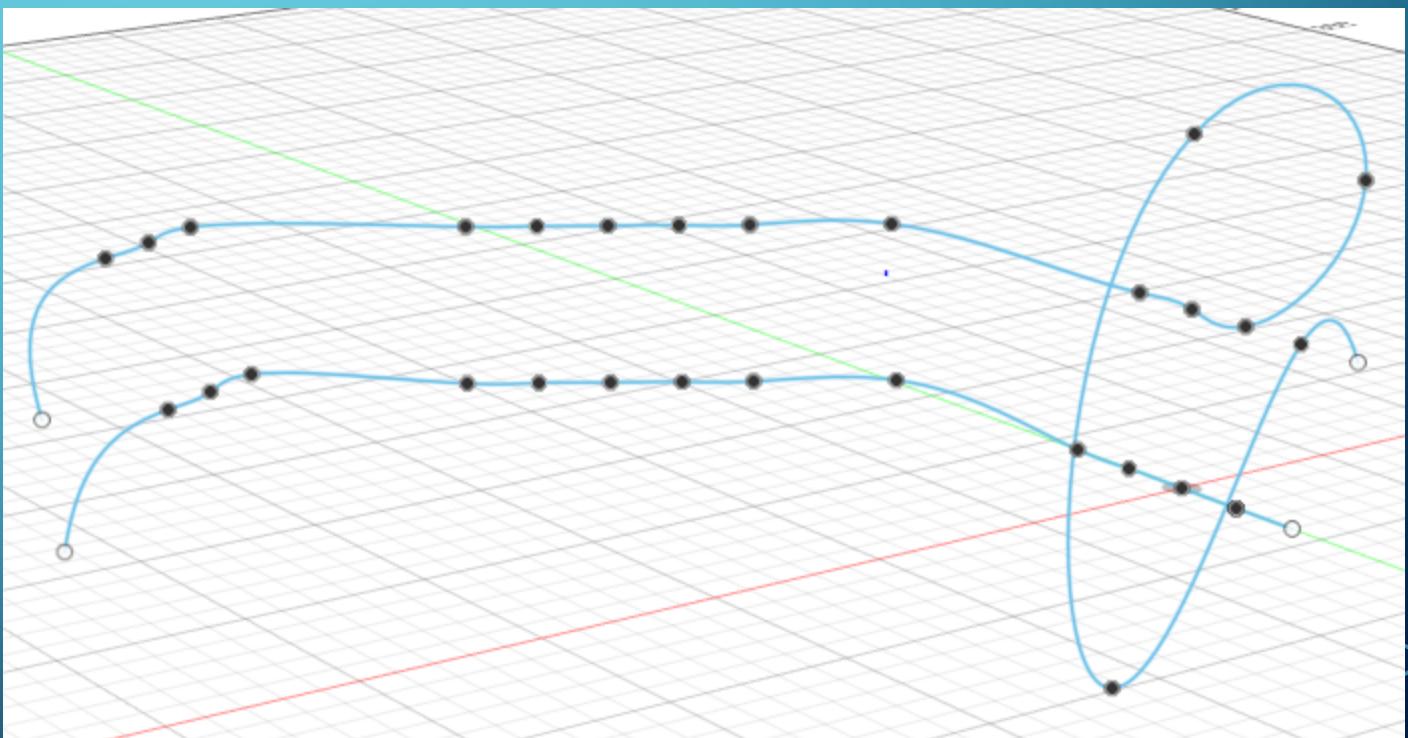
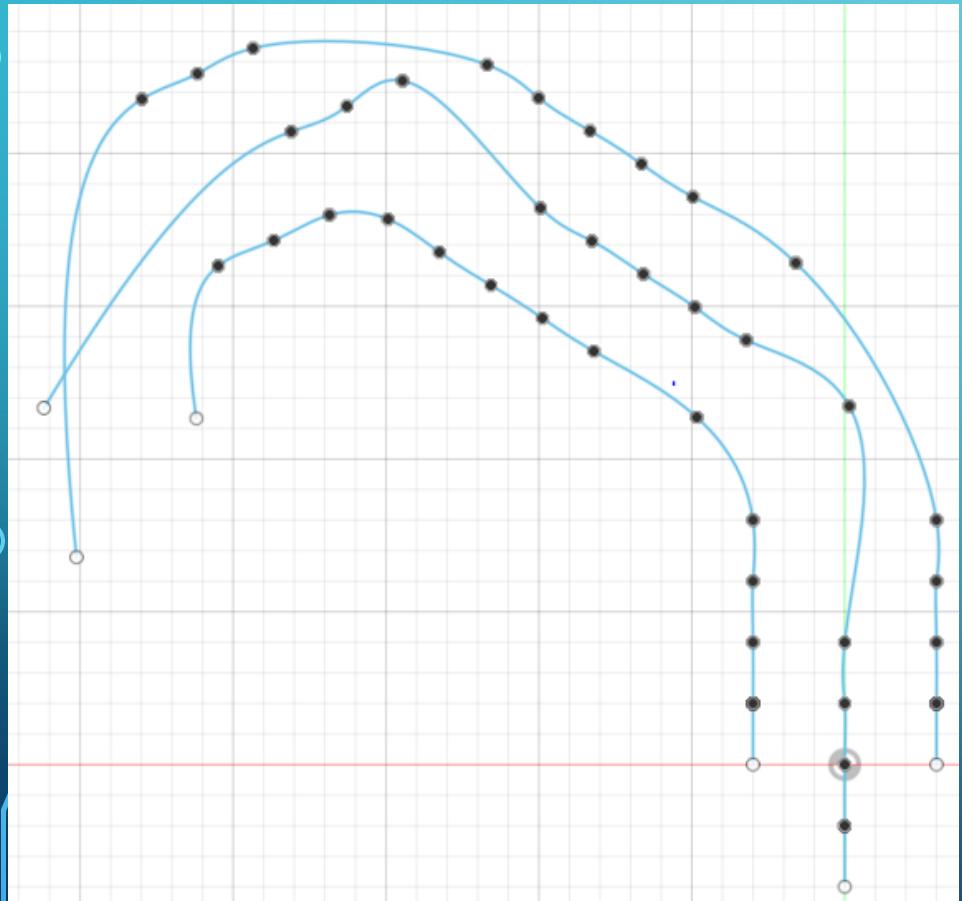
DERIVATION OF FORMULA

$$b = \sqrt{(x_R - x_L)^2 + (Y_R - Y_L)^2} = \sqrt{\left(\cos(\theta_{new}) \left(\frac{difR}{\theta_{new}}\right) - \cos(\theta_{new}) \left(\frac{difL}{\theta_{new}}\right)\right)^2 + \left(\sin(\theta_{new}) \left(\frac{difR}{\theta_{new}}\right) - \sin(\theta_{new}) \left(\frac{difL}{\theta_{new}}\right)\right)^2}$$

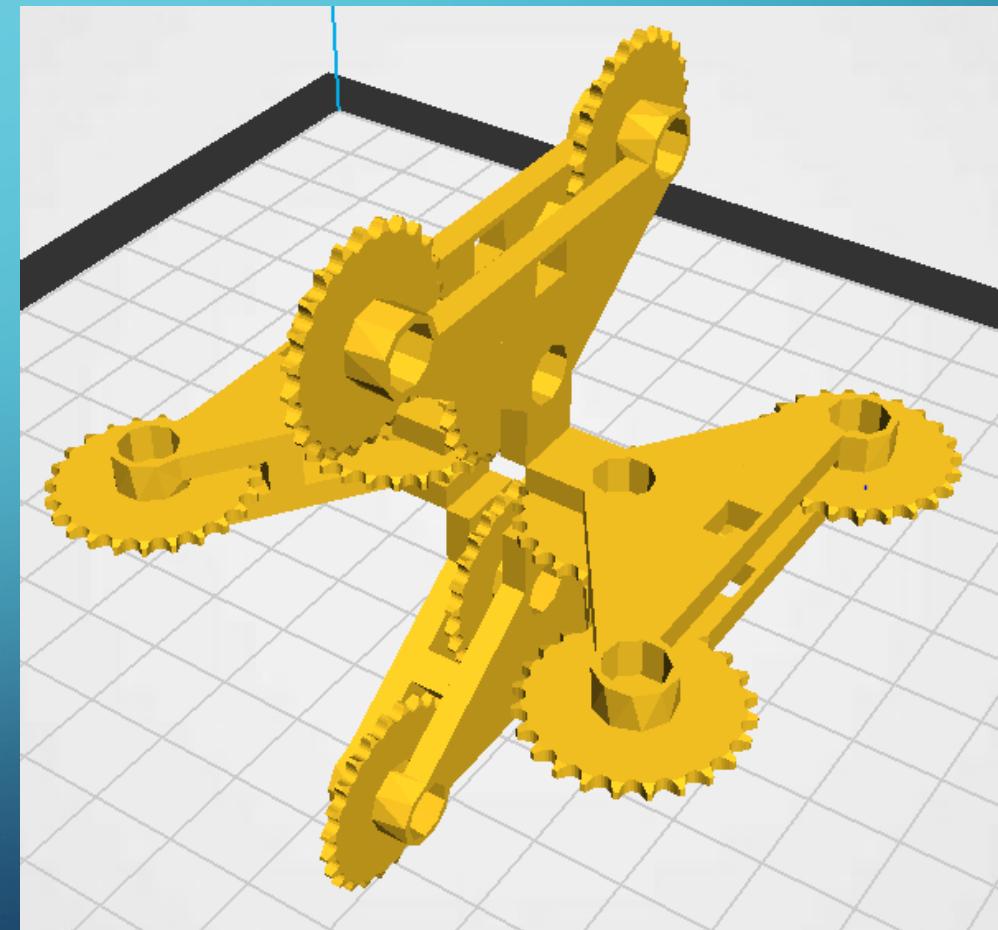
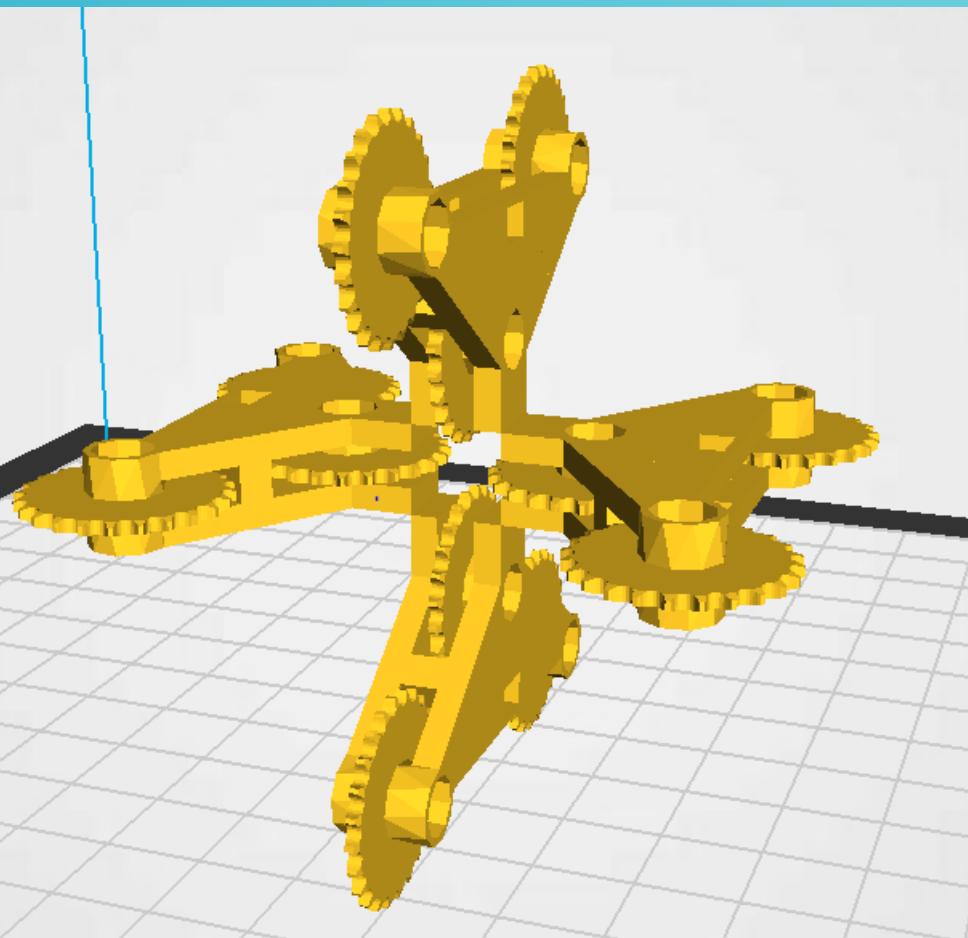
$$\theta_{new} = \frac{difRL}{baseLength}$$

- newLX = ($\cos(newTheta + currentTheta - M_PI_2) * radius$);
- newLY = ($\sin(newTheta + currentTheta - M_PI_2) * radius$);
- newRX = ($\cos(newTheta + currentTheta - M_PI_2) * (radius + baseLength)$);
- newRY = ($\sin(newTheta + currentTheta - M_PI_2) * (radius + baseLength)$);

DEMONSTRATION



STAGE 2



STAGE 3

