

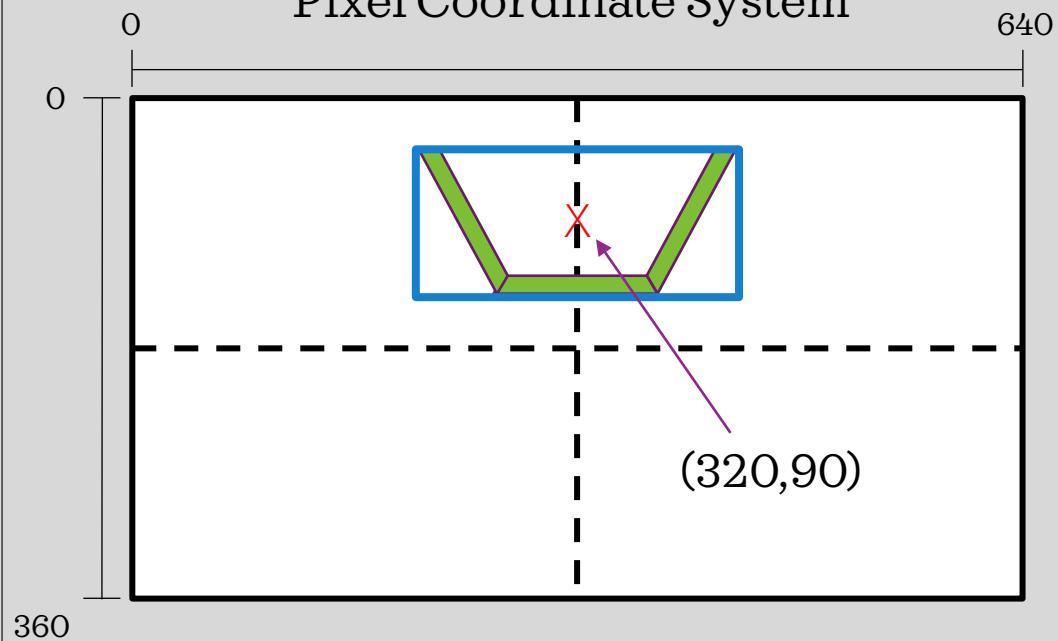


VISION DISTANCE CALCULATION

By Fred Probst

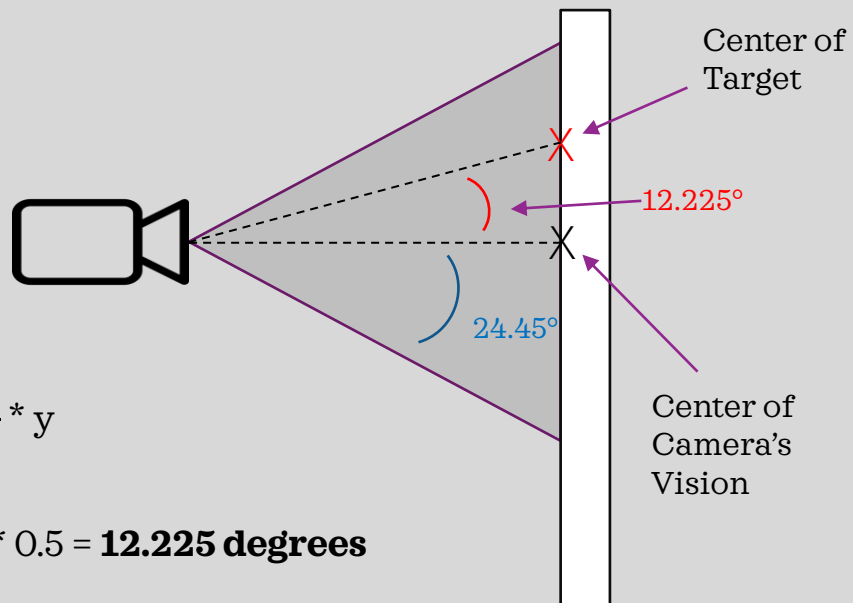
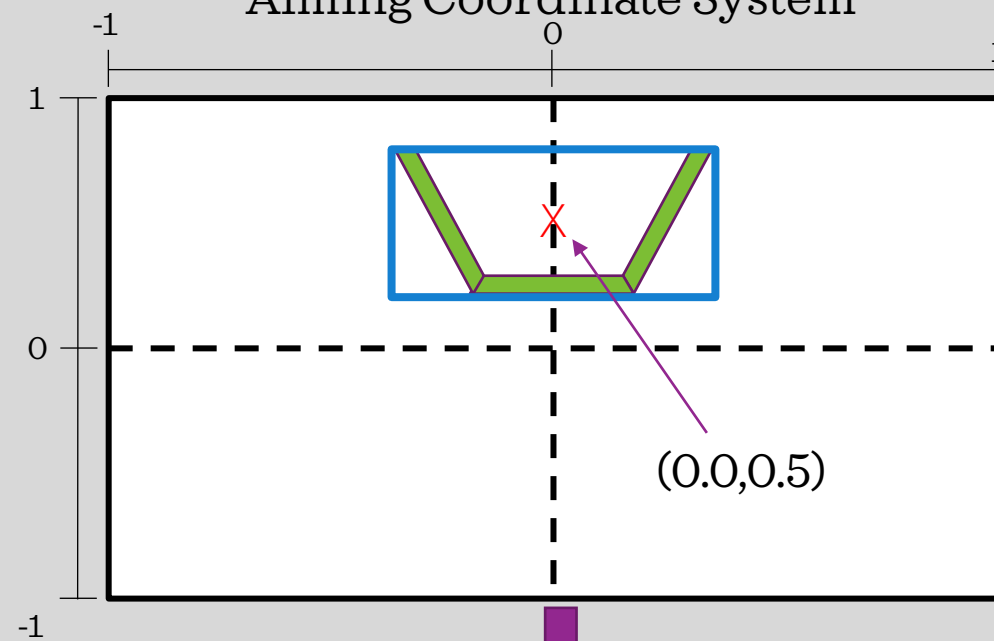
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Pixel Coordinate System



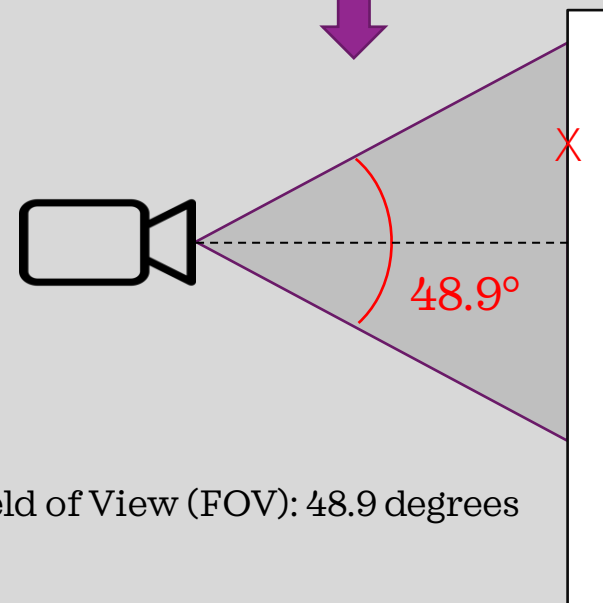
Math

Aiming Coordinate System



$$\text{Pitch} = \frac{FOV}{2} * y$$

$$\text{Pitch: } \frac{48.9}{2} * 0.5 = \mathbf{12.225 \text{ degrees}}$$

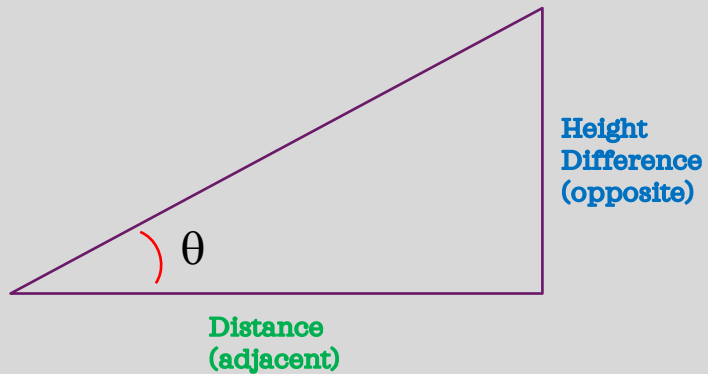
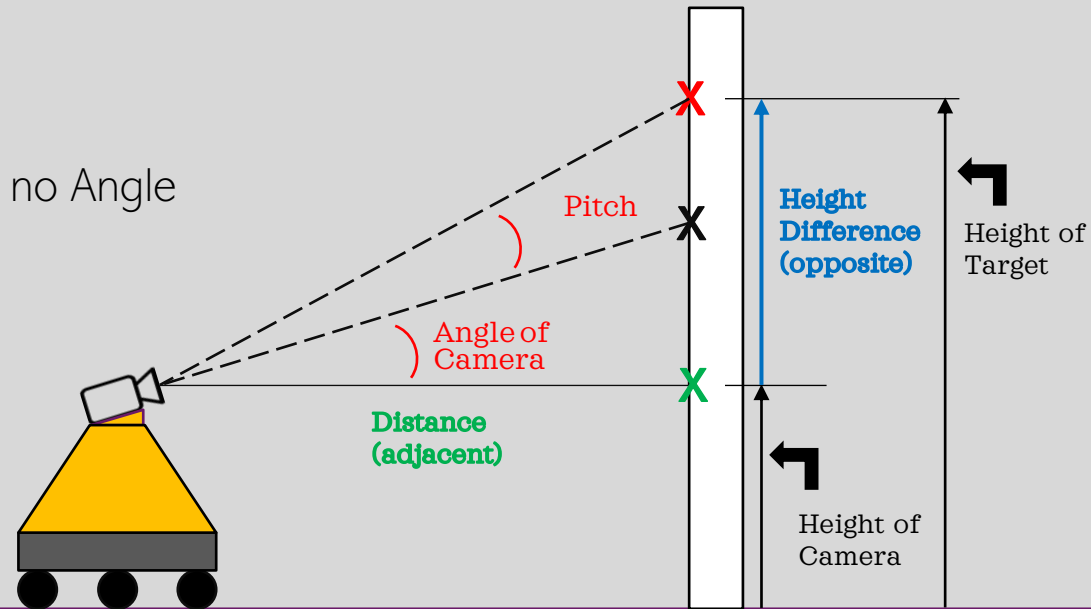


Field of View (FOV): 48.9 degrees

X = Target

X = Center of Camera's Vision

X = Center of Camera's Vision with no Angle



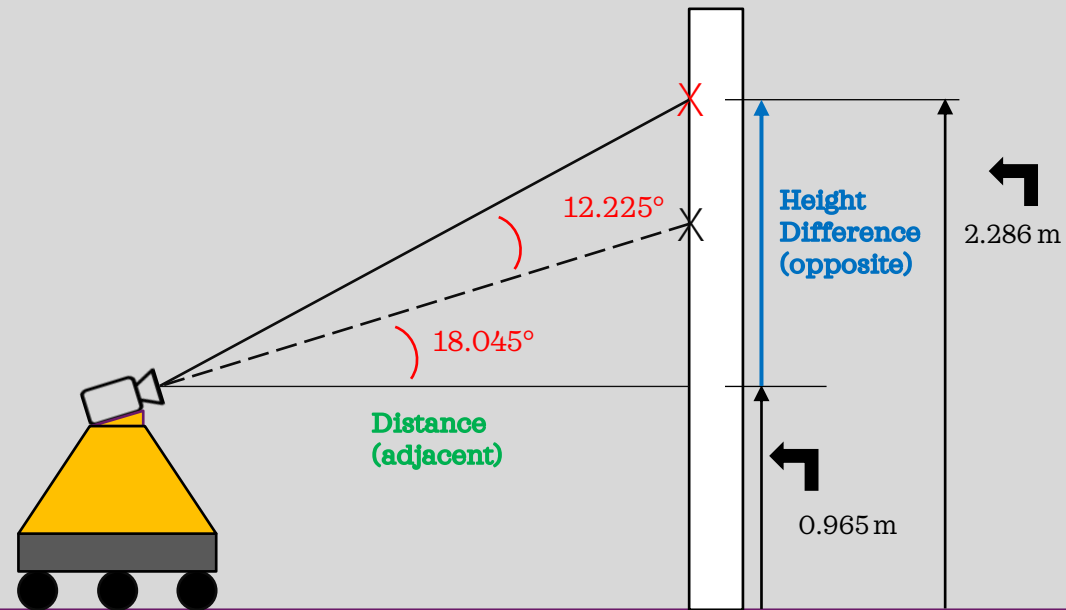
$$\text{Tan}(\theta) = \frac{\text{opposite}}{\text{adjacent}}$$

$$\text{adjacent} = \frac{\text{opposite}}{\text{Tan}(\theta)}$$

$$\text{Distance} = \frac{\text{Height of Target} - \text{Height of Camera}}{\text{Tan}(\text{Pitch} + \text{Angle of Camera})}$$

$$\theta = \text{Pitch} + \text{Angle of Camera}$$

$$\text{Height Difference} = \text{Height of Target} - \text{Height of Camera}$$



$$\text{Tan}(\theta) = \frac{\text{opposite}}{\text{adjacent}}$$

$$\text{adjacent} = \frac{\text{opposite}}{\text{Tan}(\theta)}$$

$$\text{Distance} = \frac{2.286 - 0.965}{\text{Tan}(12.225^\circ + 18.045^\circ)}$$

$$\text{Distance} = \mathbf{2.263 \text{ meters}}$$

$$\theta = \text{Pitch} + \text{Angle of Camera}$$

$$\text{Height Difference} = \text{Height of Target} - \text{Height of Camera}$$

Y-Coordinate vs. Distance

