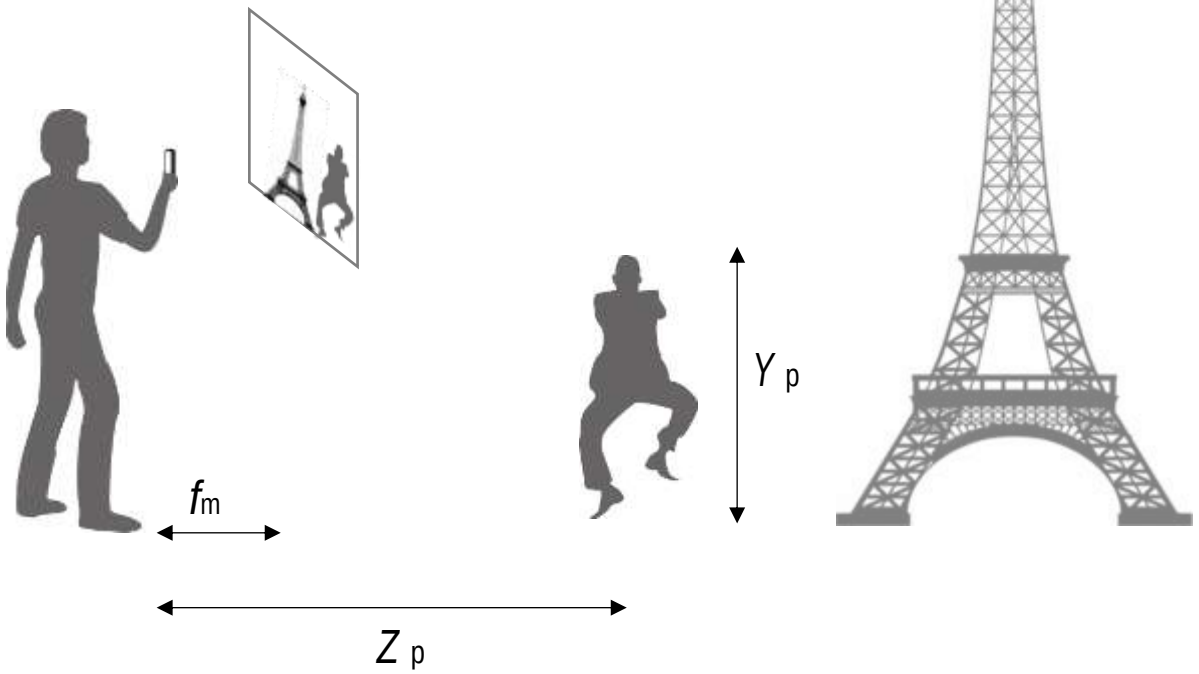
Dolly Zoom

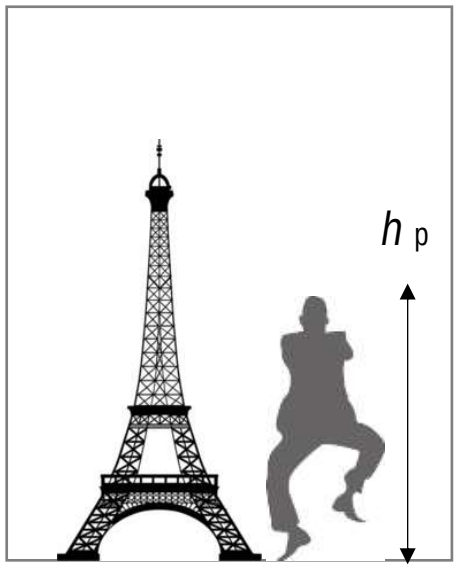

VERTIGO (1958)

"PSYCHO" 9401
DIR. MR. HITCHCOCK
CAM. J. RUSSELL
1-2960 DAY
TR 8 6

VERTIGO (1958)

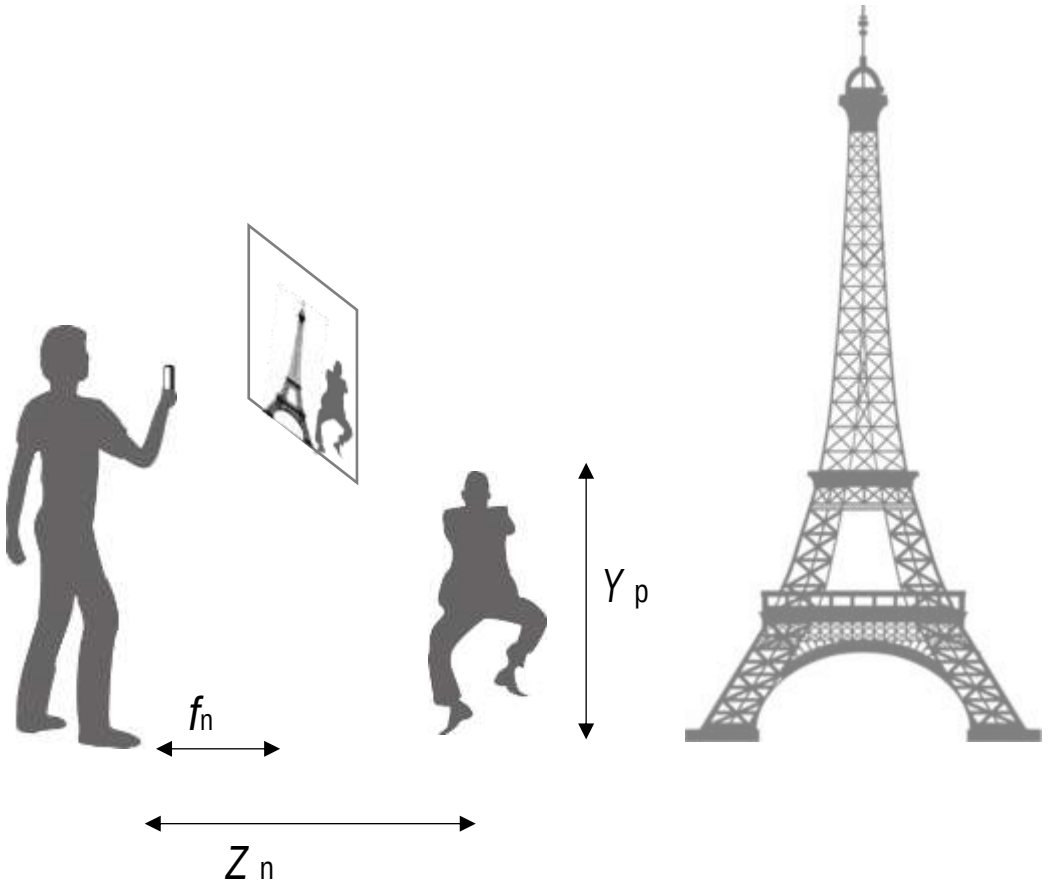
Exercise

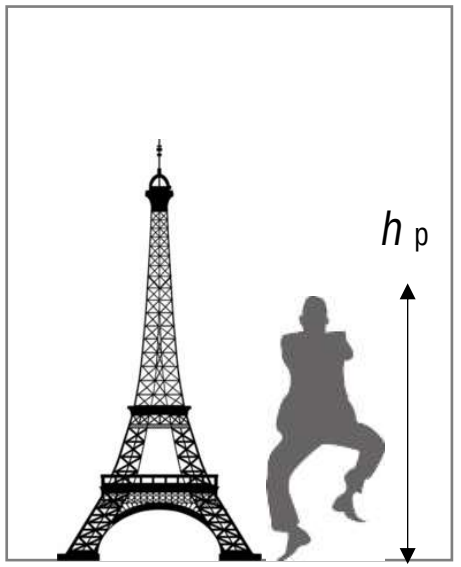




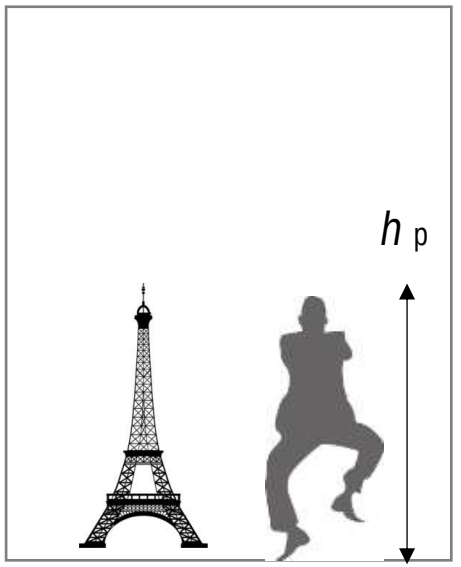
$$h_p = f_m \frac{Y_p}{Z_p}$$

Exercise





$$h_p = f_m \frac{Y_p}{Z_p}$$

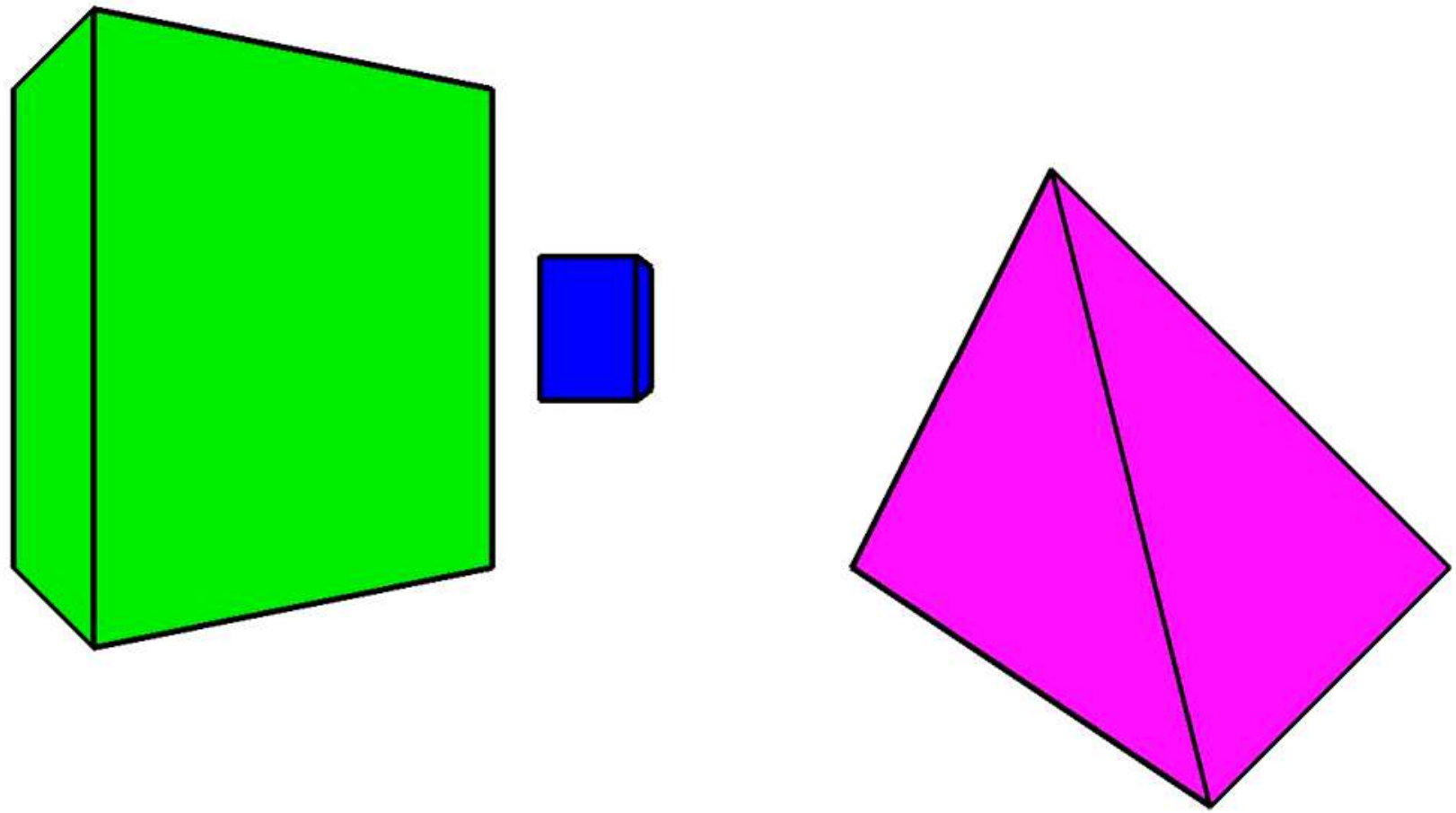


$$h_p = f_n \frac{Y_n}{Z_p}$$

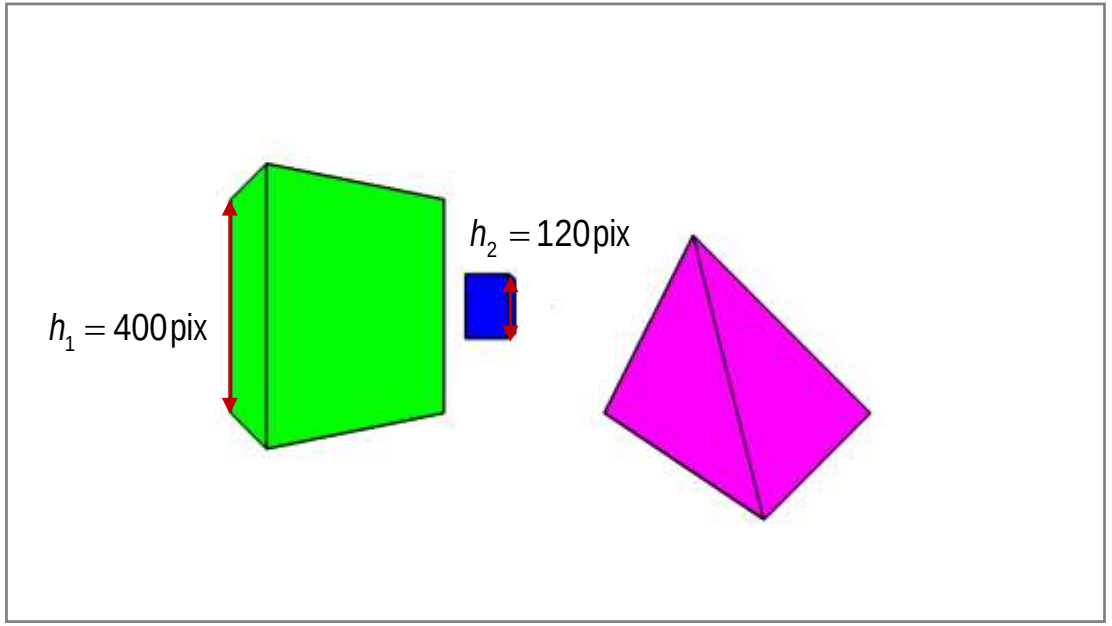

DELL


DELL


PANAFLEX



Where am I with Dolly Zoom?



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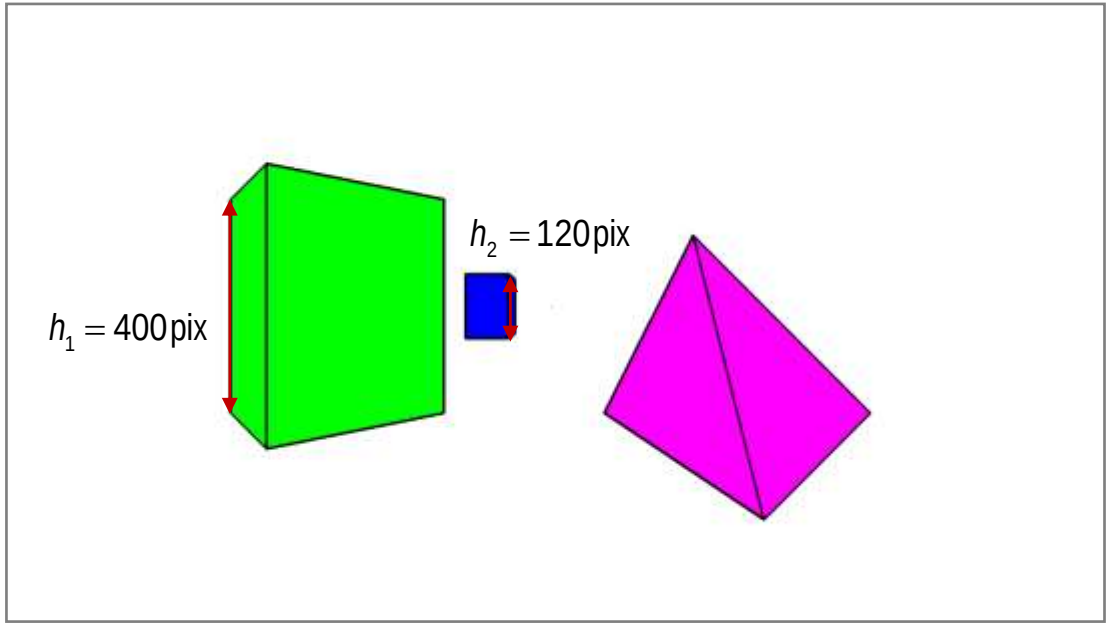
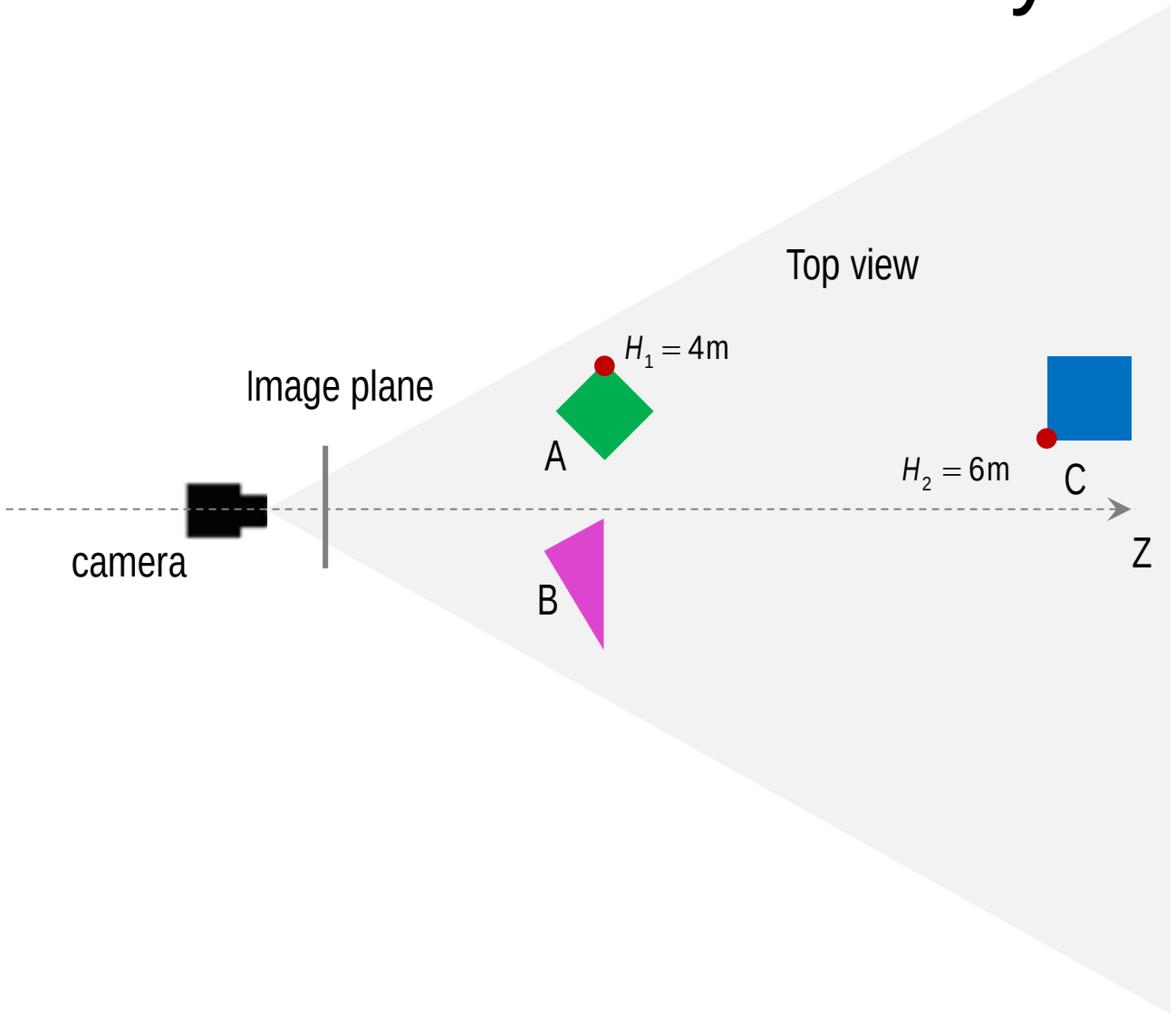
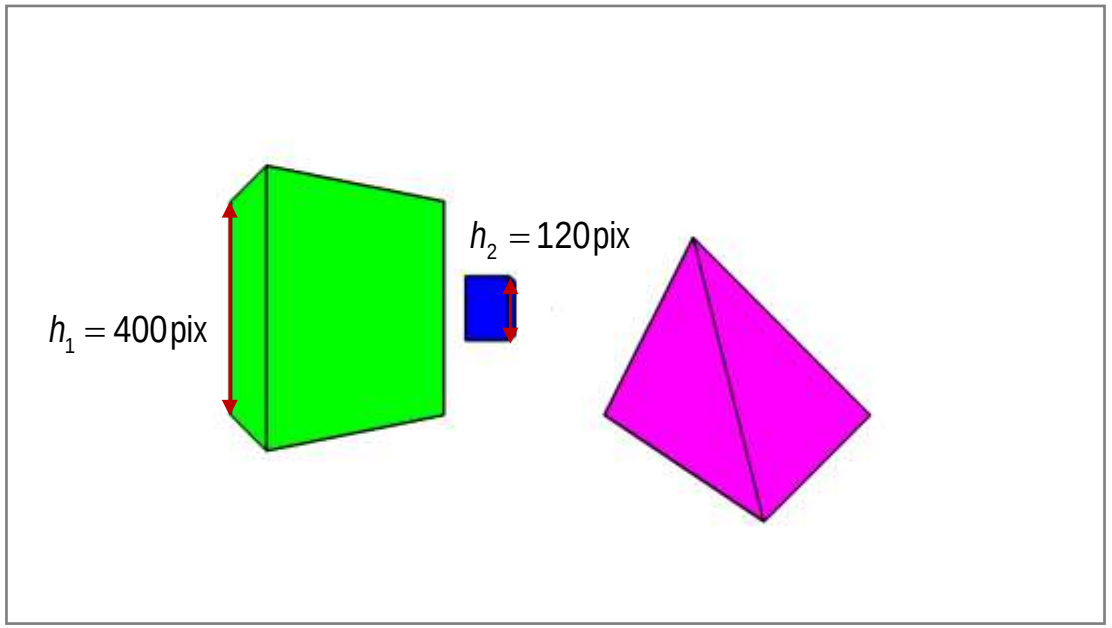


How far I need to step back with zoom factor x2?

How will h_2 change?

Where am I with Dolly Zoom?





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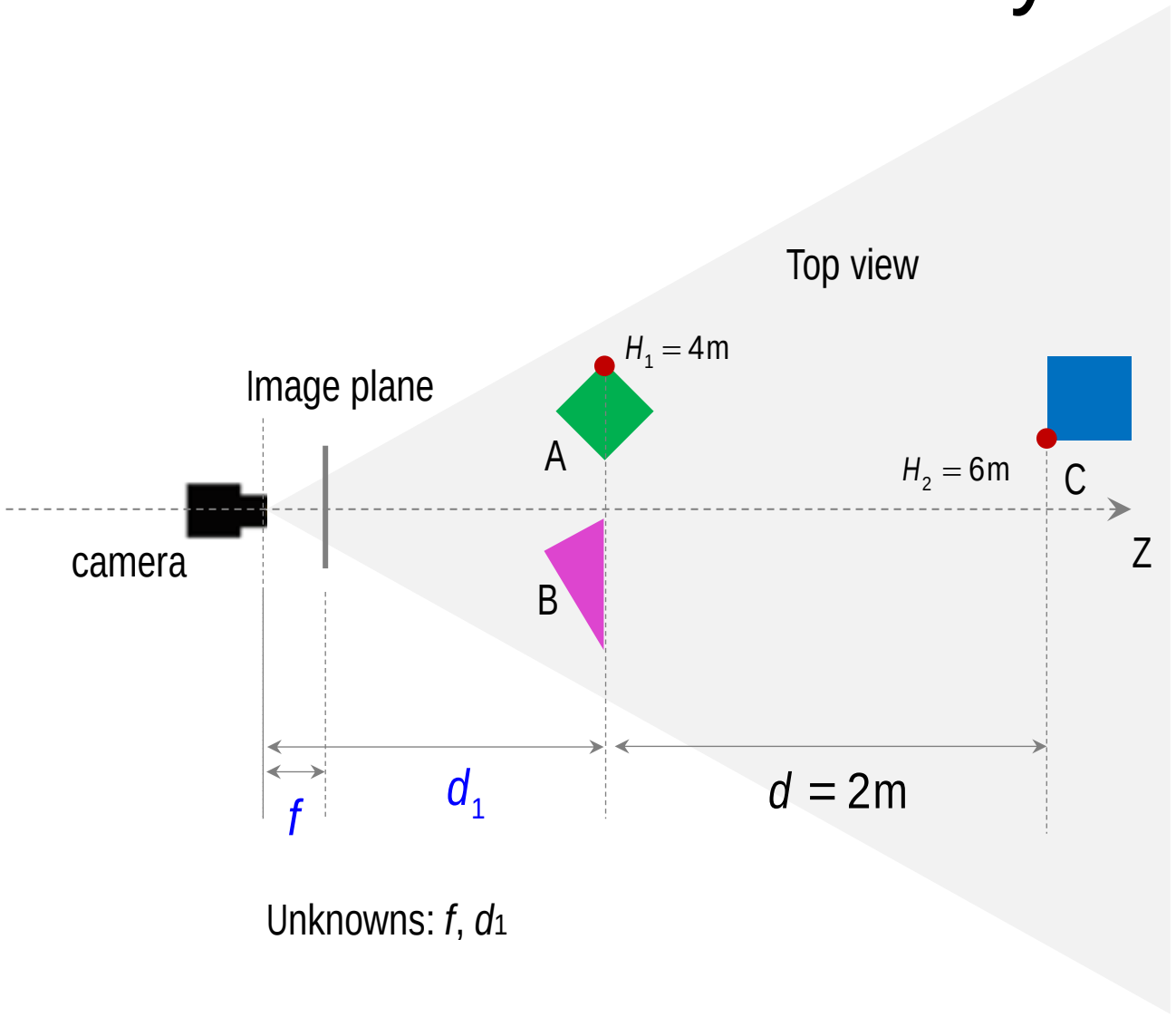
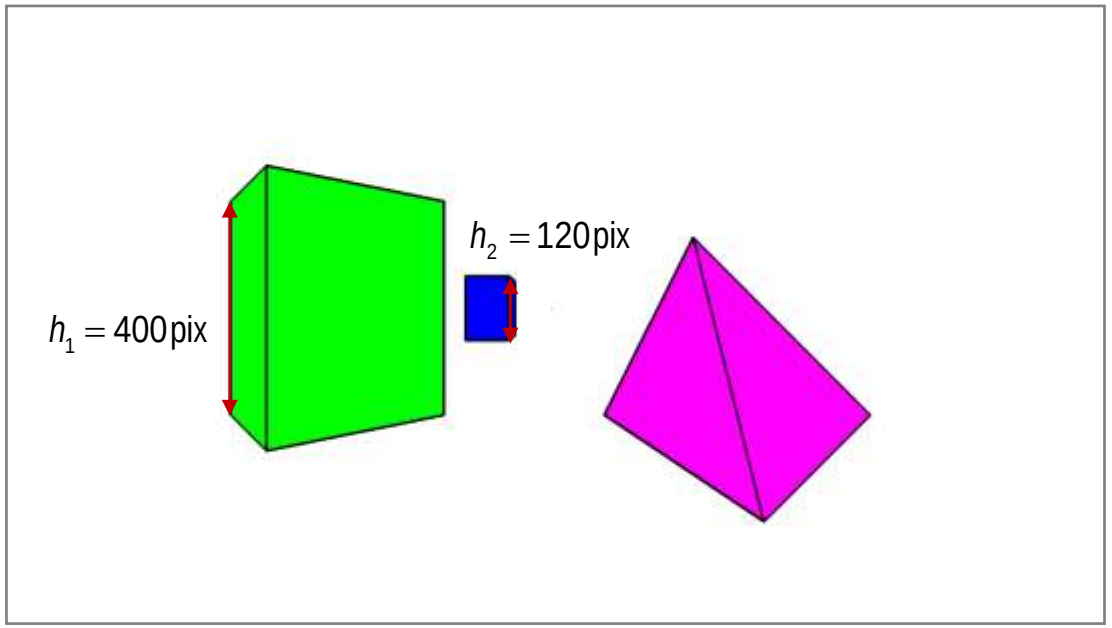


Unknowns: f, d_1



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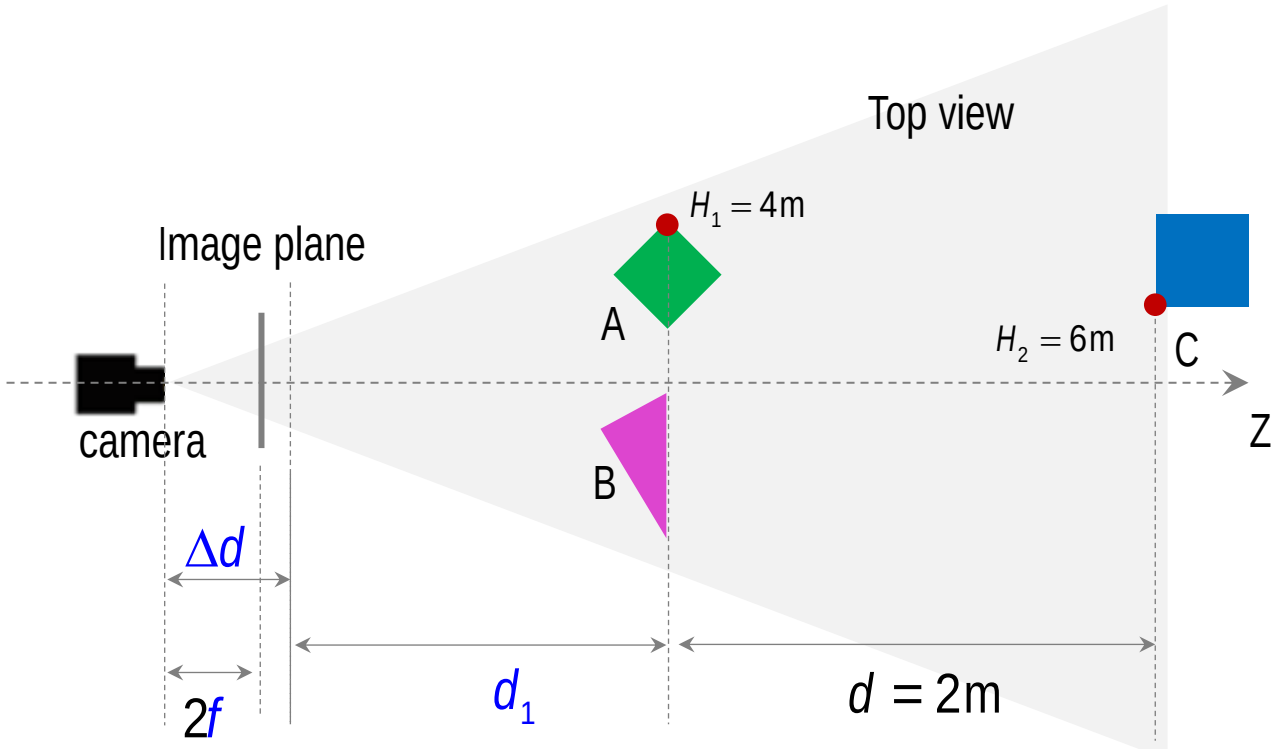
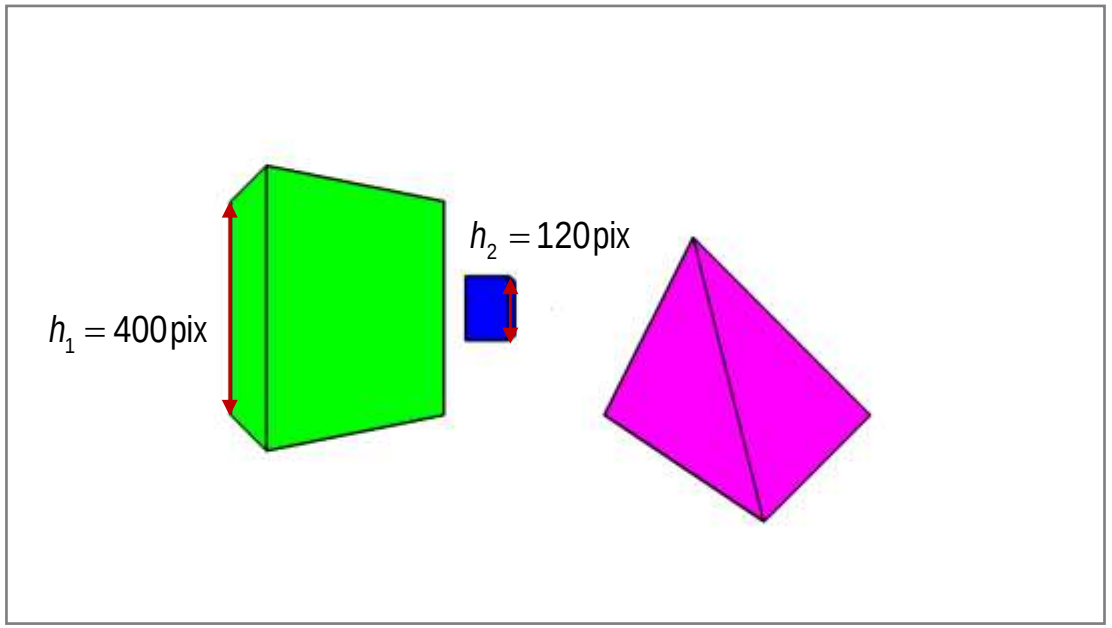


Unknowns: f, d_1, Δd



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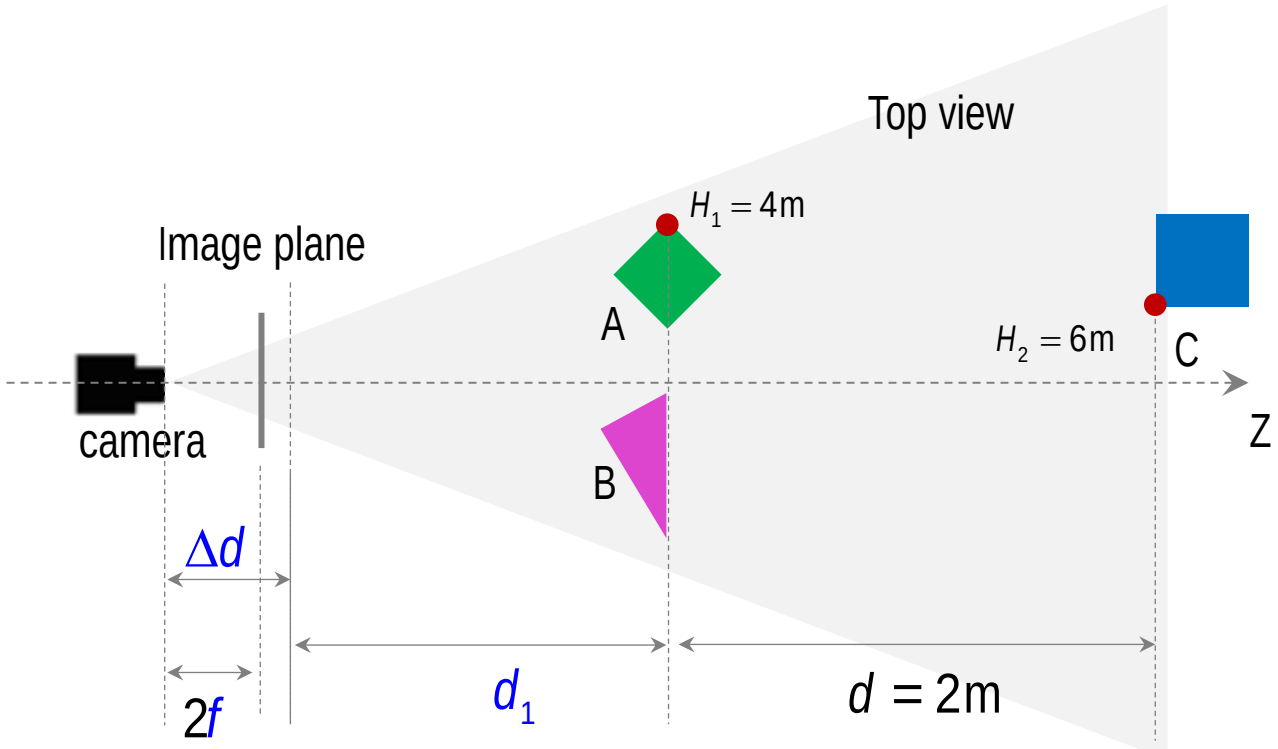
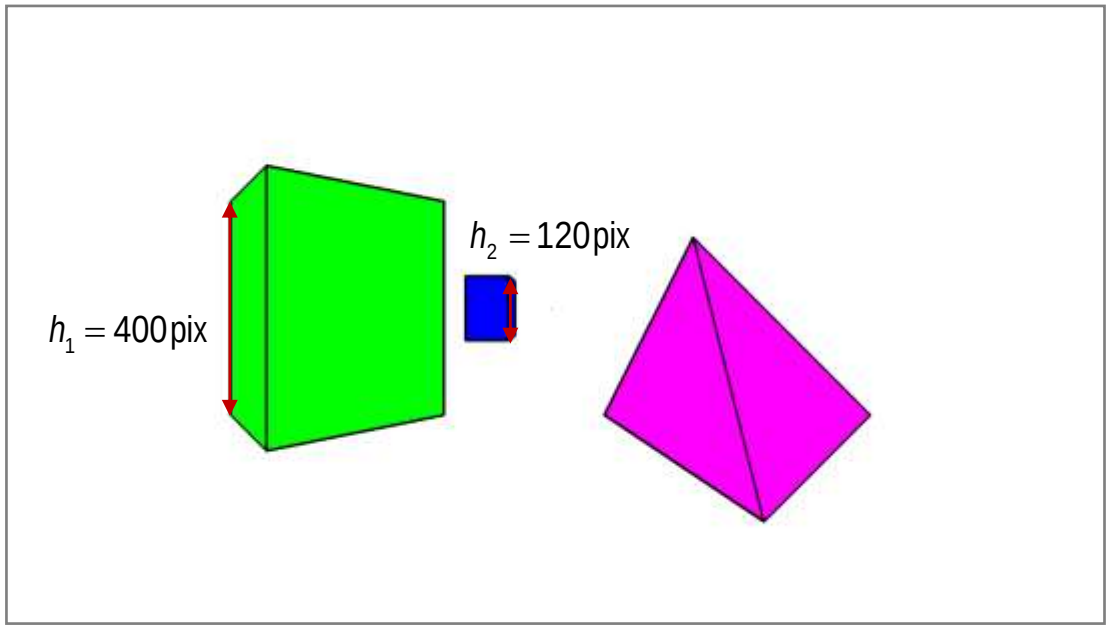
Equations:

$$h_1 = f\frac{H_1}{d_1}$$



Unknowns: f, d_1, Δd



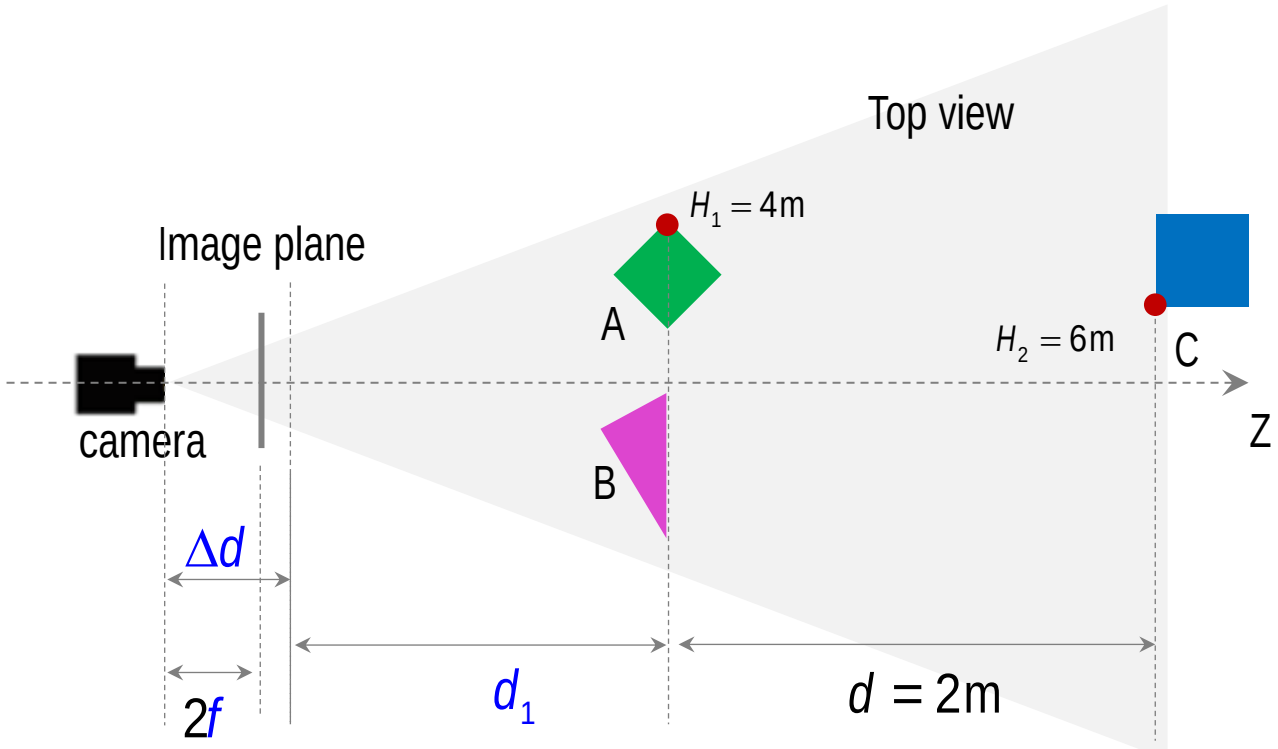
How far I need to step back with zoom factor x2?

How will h_2 change?

Where am I with Dolly Zoom?

Equations:

$$h_1 = f\frac{H_1}{d_1} \qquad h_1 = 2f\frac{H_1}{\Delta d + d_1}$$



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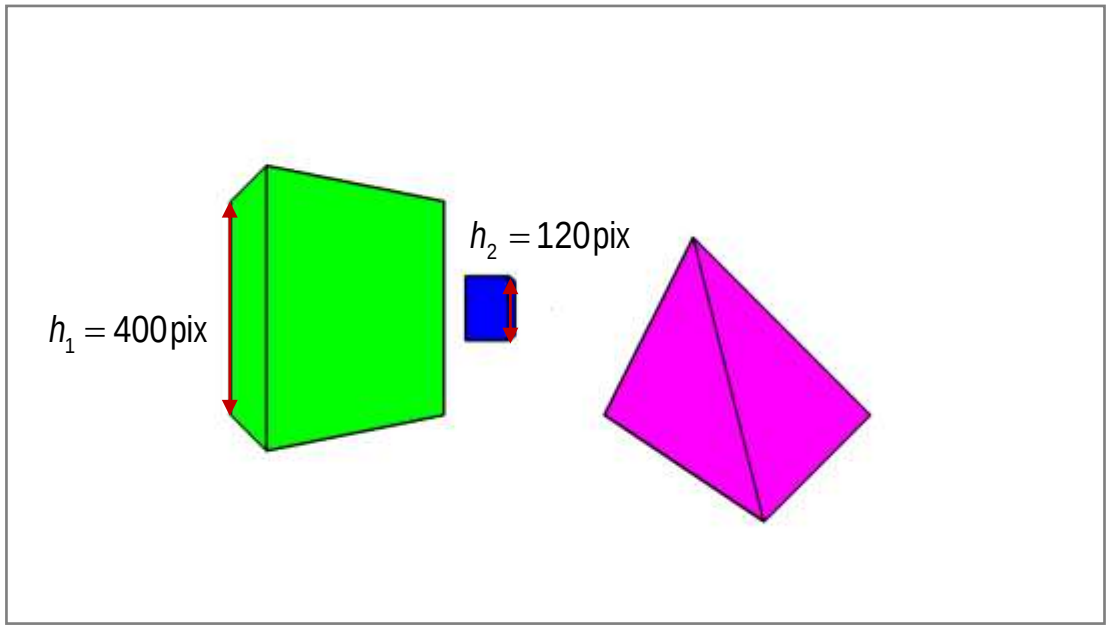

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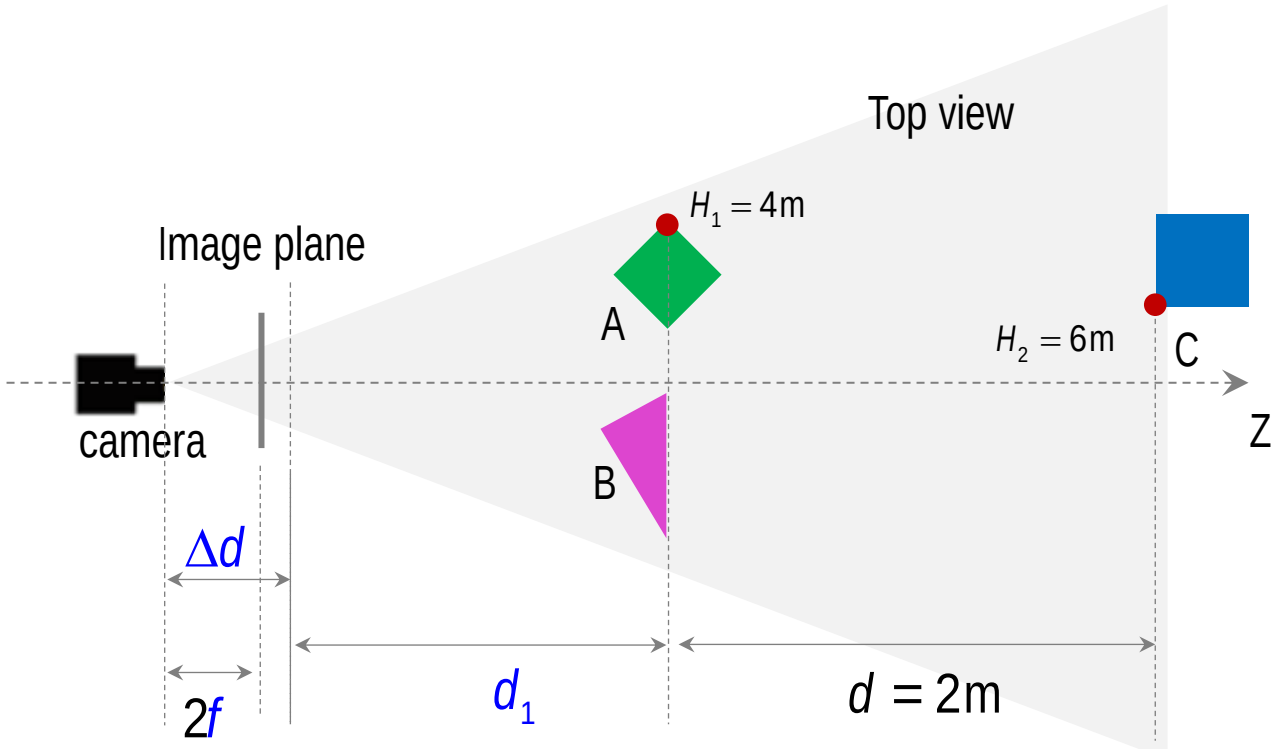
How will h_2 change?

Where am I with Dolly Zoom?

Equations:

$$h_1 = f\frac{H_1}{d_1} \qquad h_1 = 2f\frac{H_1}{\Delta d + d_1} \longrightarrow \Delta d = d_1$$



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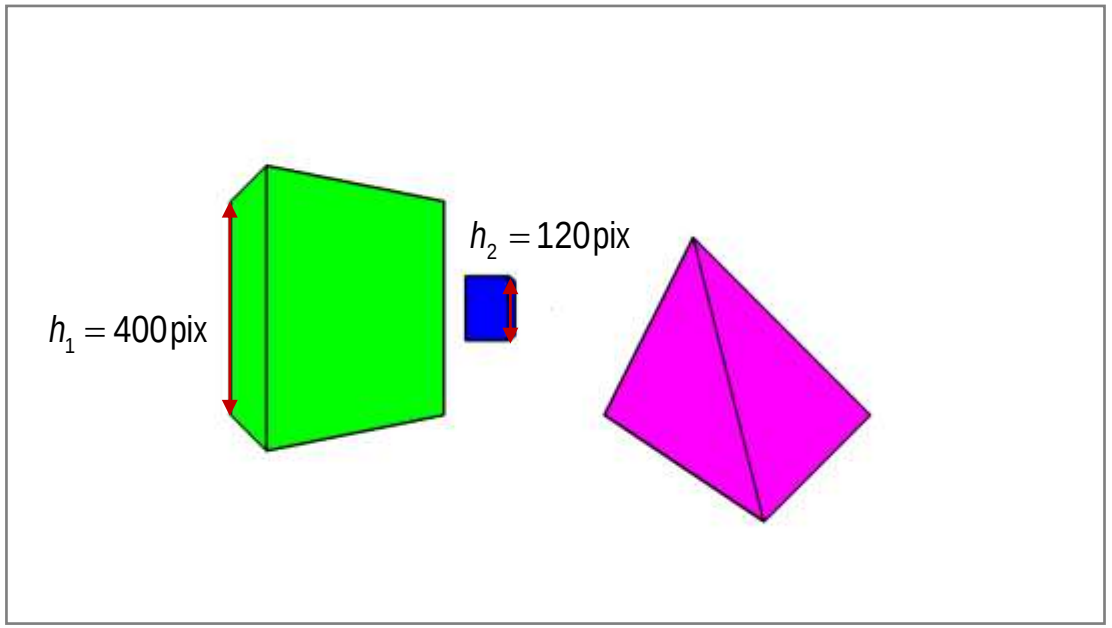

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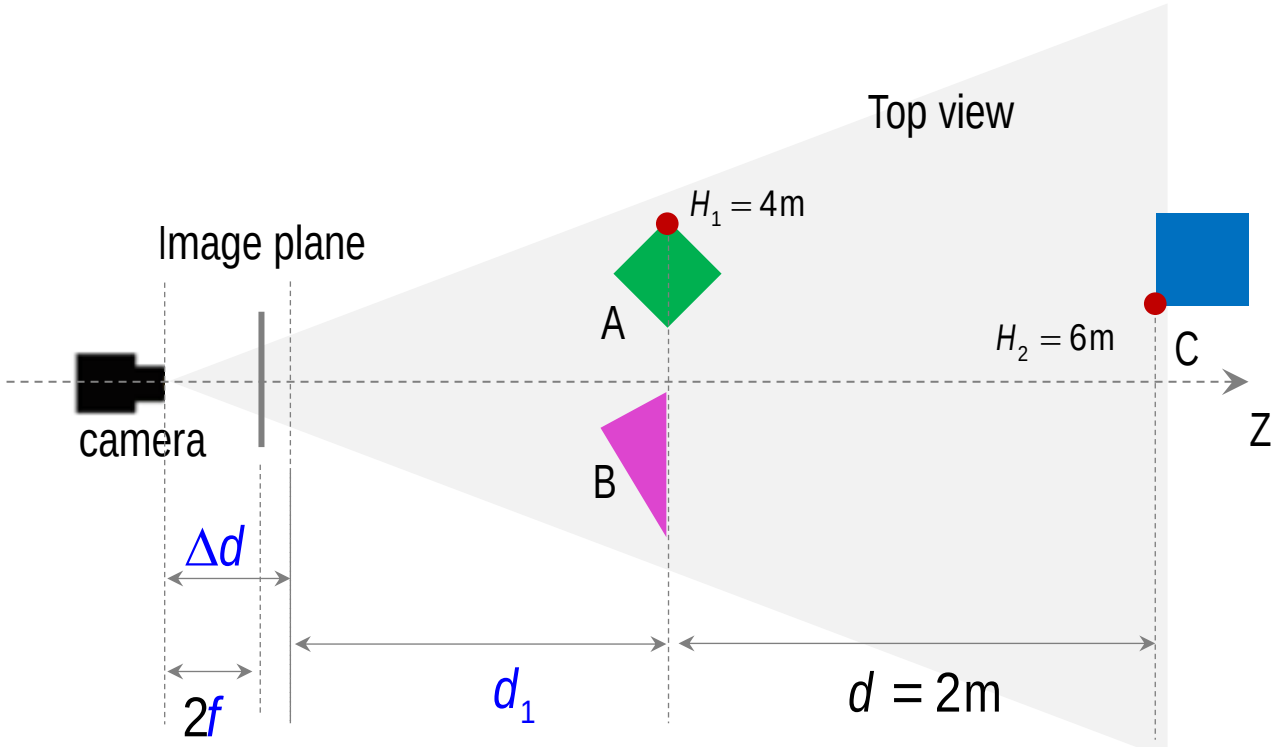
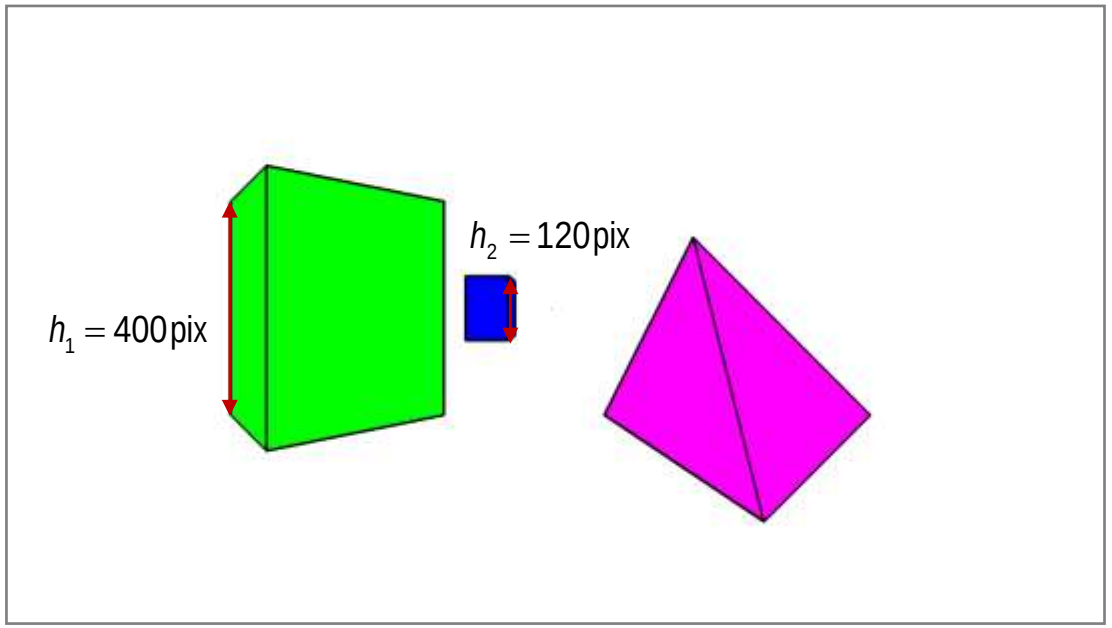
$$h_1 = f\frac{H_1}{d_1} \qquad h_1 = 2f\frac{H_1}{\Delta d + d_1} \longrightarrow \Delta d = d_1$$

$$h_2 = f\frac{H_2}{d_1 + d}$$



Unknowns: f, d_1, Δd



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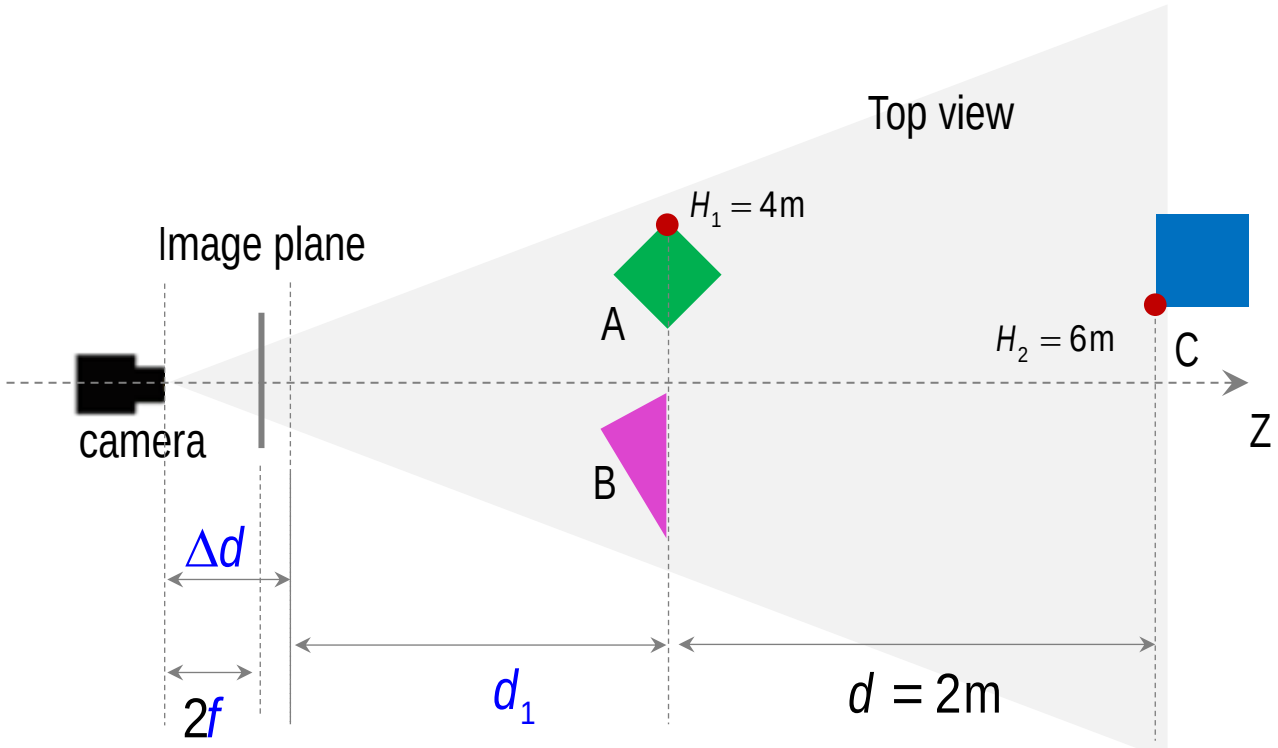
$$h_1 = f\frac{H_1}{d_1}$$

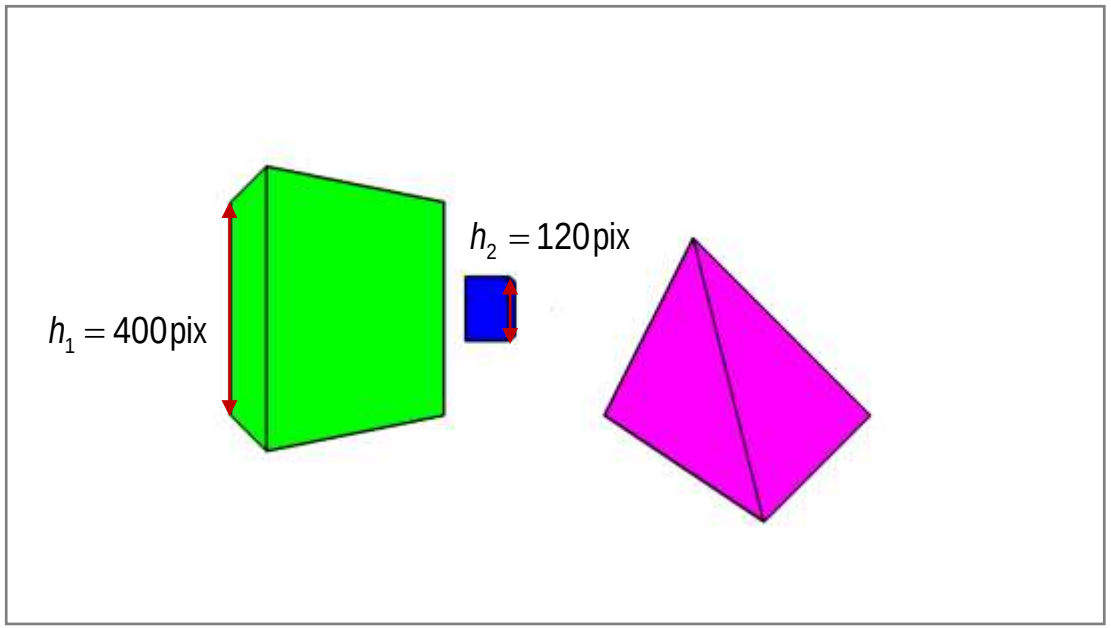
$$h_2 = f\frac{H_2}{d_1 + d}$$

$$h_1 = 2f\frac{H_1}{\Delta d + d_1} \longrightarrow \Delta d = d_1$$

$$d_1 = \frac{1}{1 - \frac{h_2 H_1}{h_1 H_2}} d = 2.5\text{m} \qquad \Delta d = 2.5\text{m}$$



Unknowns: f, d_1, Δd



$h_2 = 120\text{pix} \longrightarrow h_2' = 200\text{pix}$

Where am I with Dolly Zoom?

Equations:

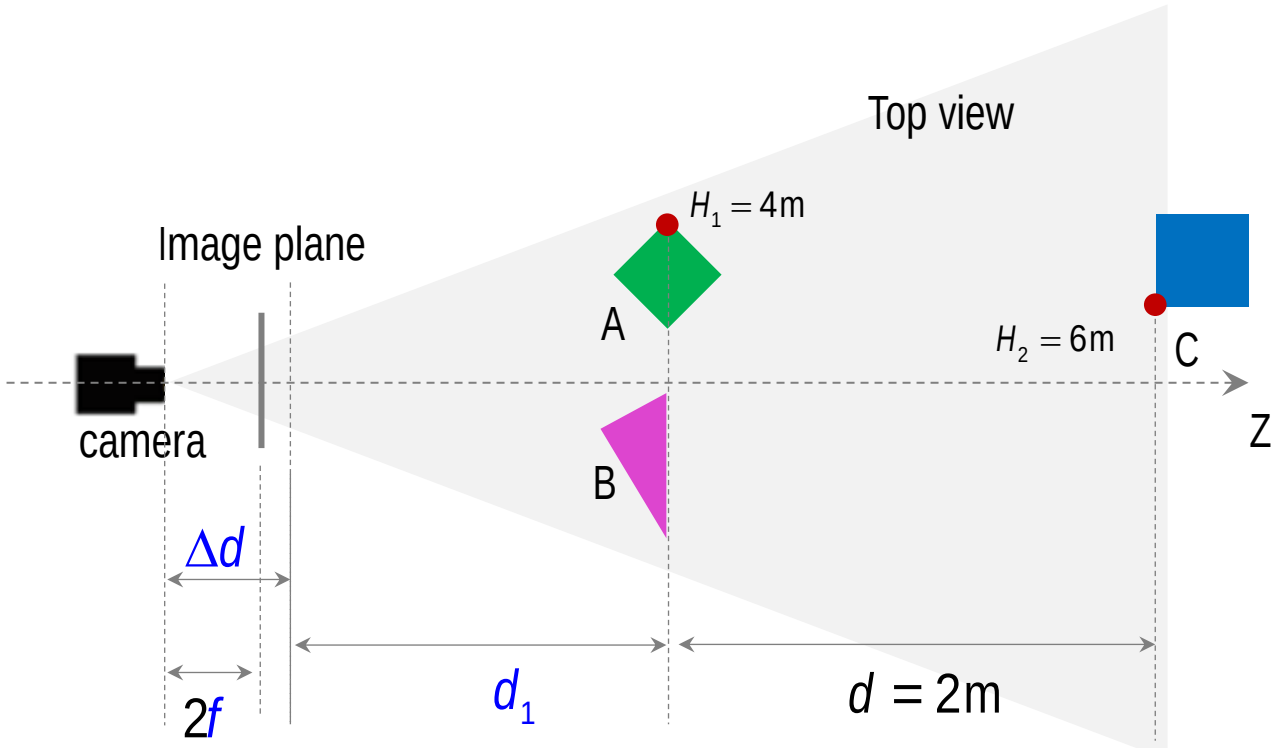
$$h_1 = f\frac{H_1}{d_1}$$

$$h_2 = f\frac{H_2}{d_1 + d}$$

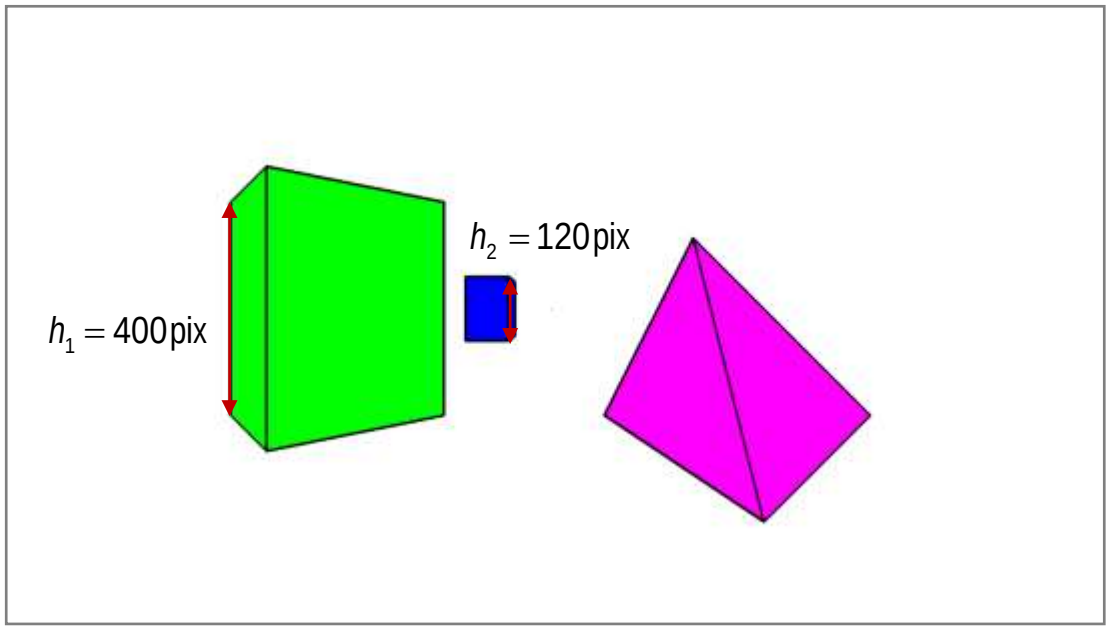
$$d_1 = \frac{1}{1 - \frac{h_2 H_1}{h_1 H_2}} d = 2.5\text{m}$$

$$h_1 = 2f\frac{H_1}{\Delta d + d_1} \longrightarrow \Delta d = d_1$$

$\Delta d = 2.5\text{m}$ $f = 250\text{pix}$



Unknowns: f, d_1, Δd



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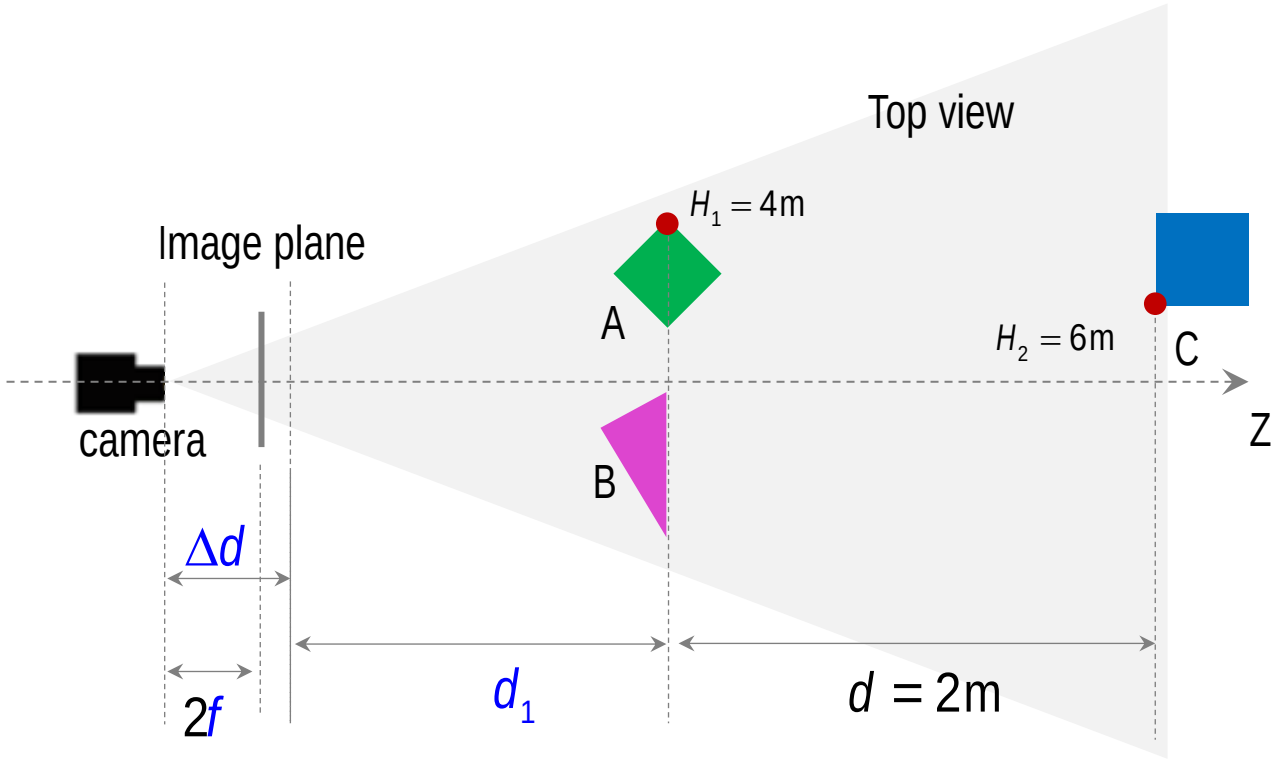
Equations:

$$h_1 = f\frac{H_1}{d_1} \qquad h_1 = 2f\frac{H_1}{\Delta d + d_1}$$

$$h_2 = f\frac{H_2}{d_1 + d} \qquad h_2' = 2f\frac{H_2}{\Delta d + d_1 + d}$$



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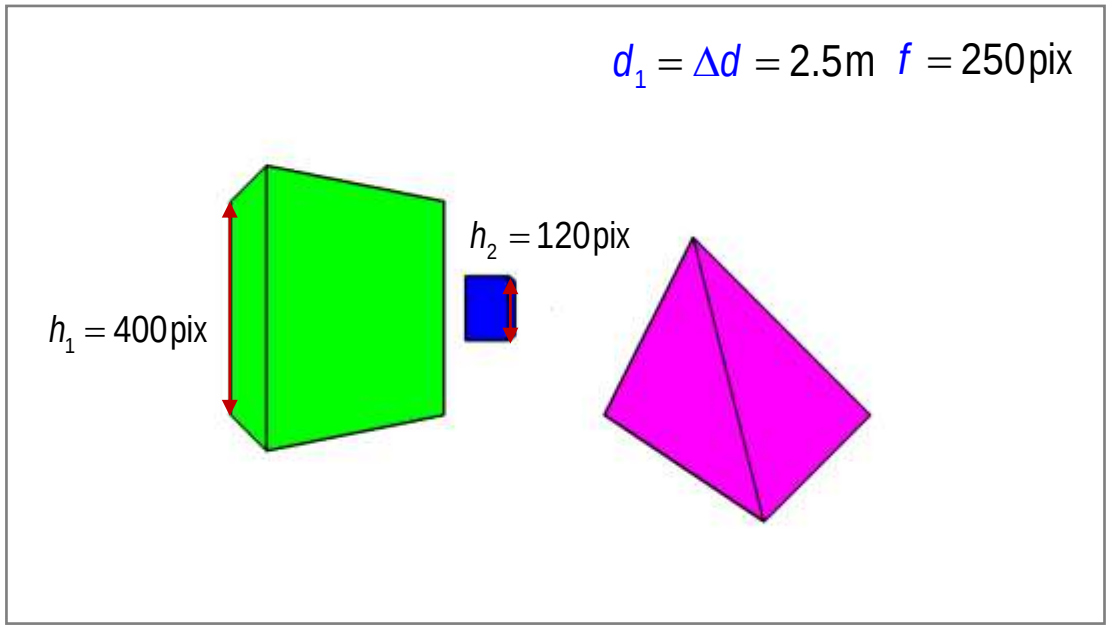

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How will h_2 change?

Where am I with Dolly Zoom?

Equations:

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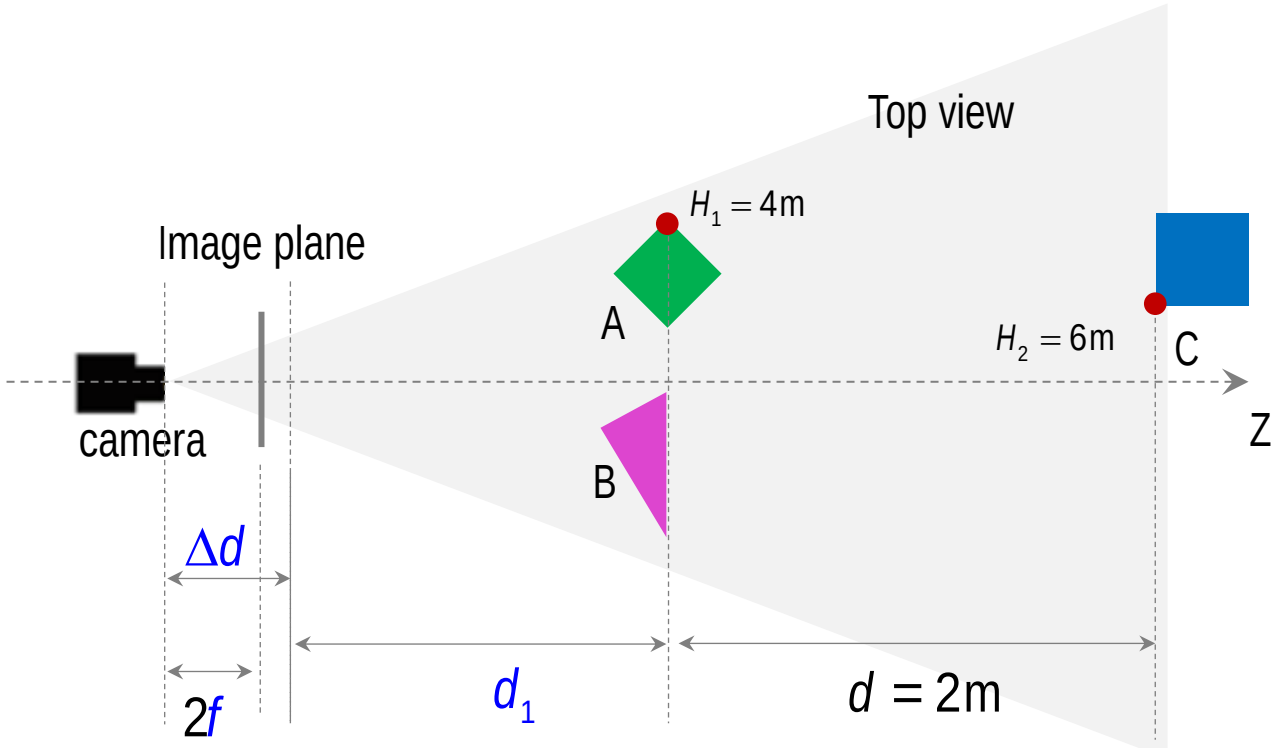
$$h_2 = f\frac{H_2}{d_1 + d} \qquad h_2' = 2f\frac{H_2}{\Delta d + d_1 + d} = 429\,\text{pix}$$



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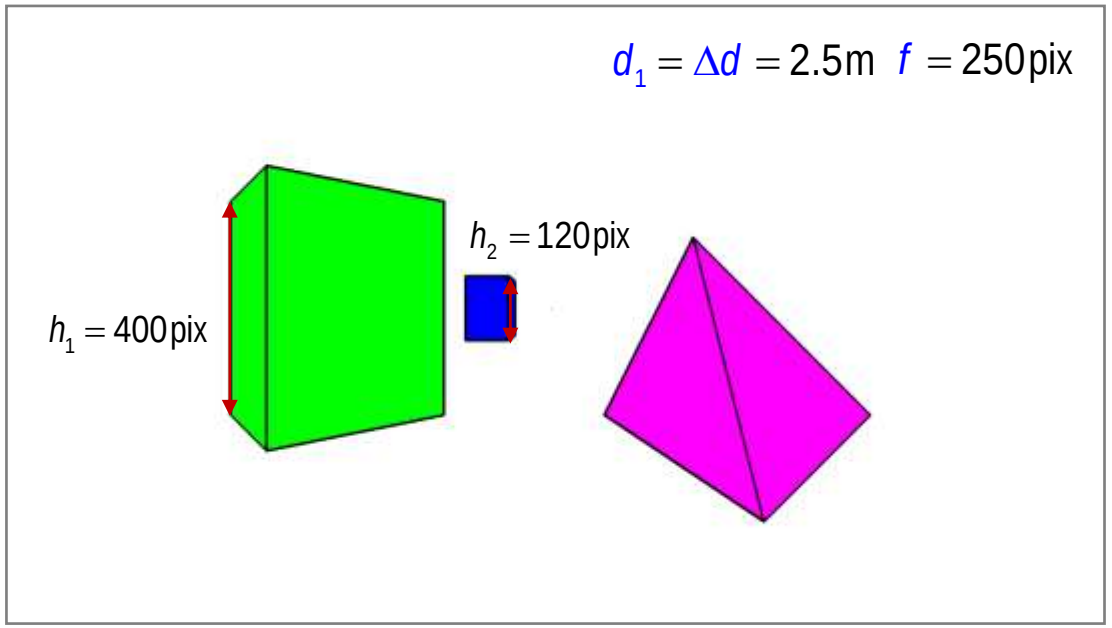

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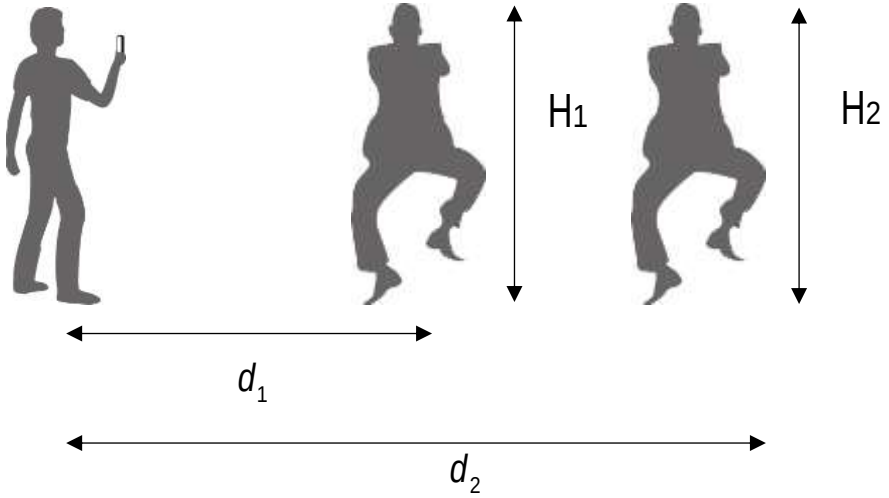
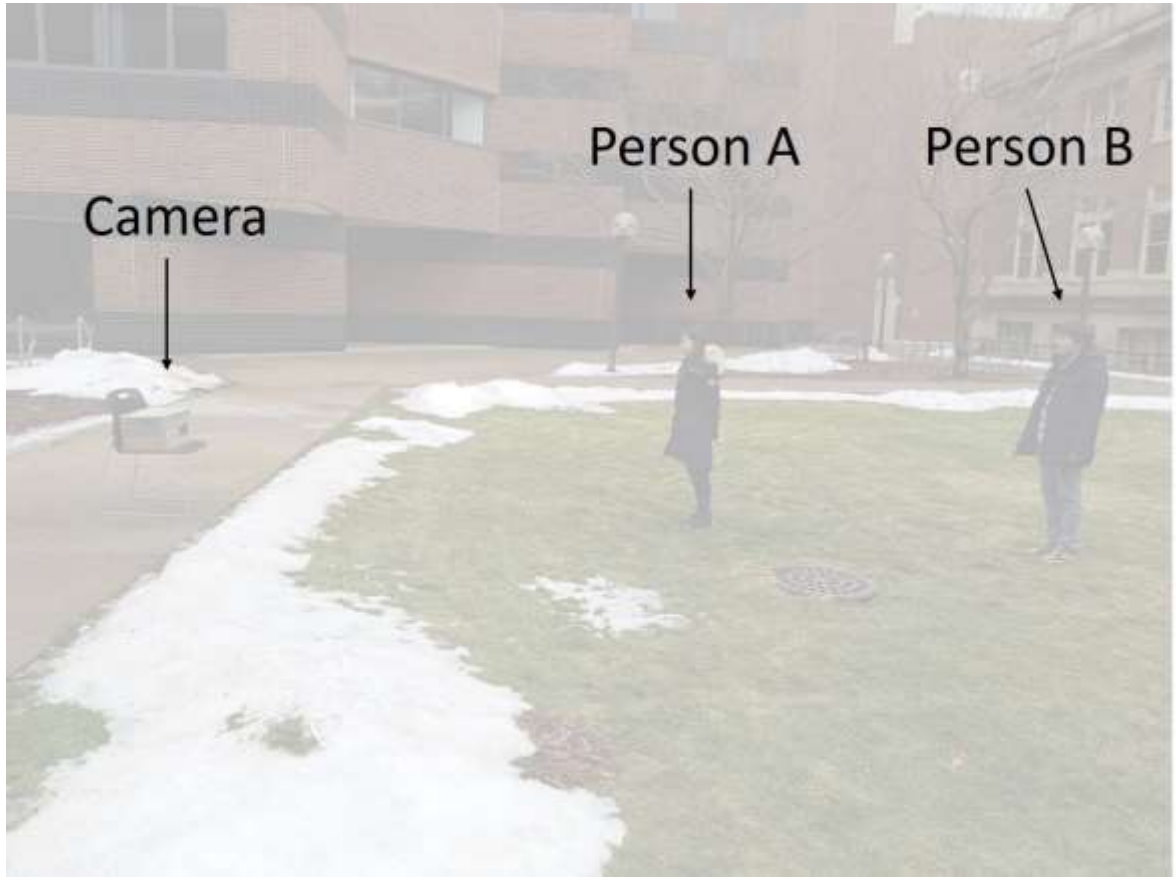
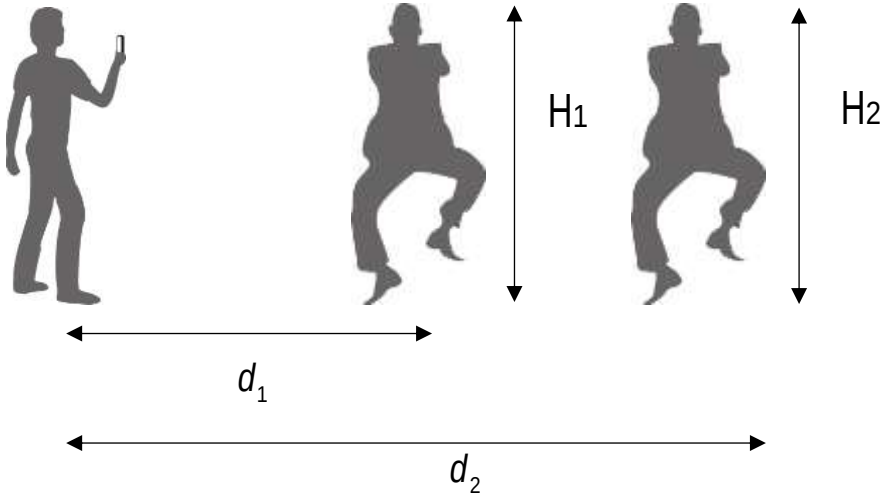
HW #1 Camera Obscura and Dolly Zoom





1) Take a photo of two persons

HW #1 Camera Obscura and Dolly Zoom



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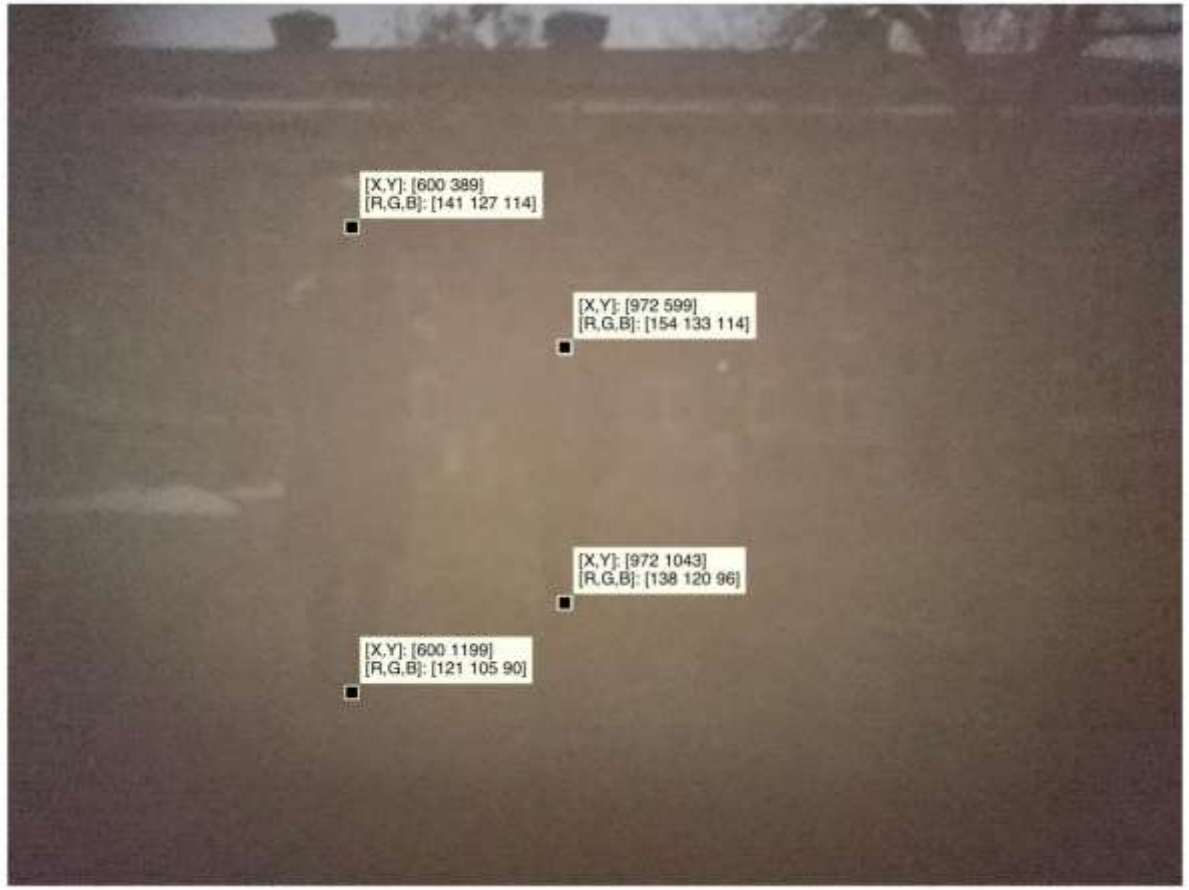
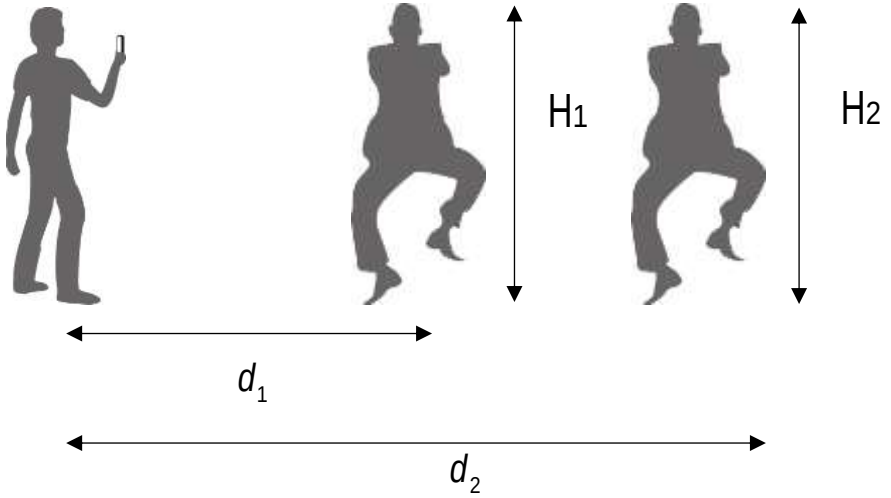


$f = 2017.43\,\text{pix} \quad H_1 = 1.6\,\text{m}$

HW #1 Camera Obscura and Dolly Zoom



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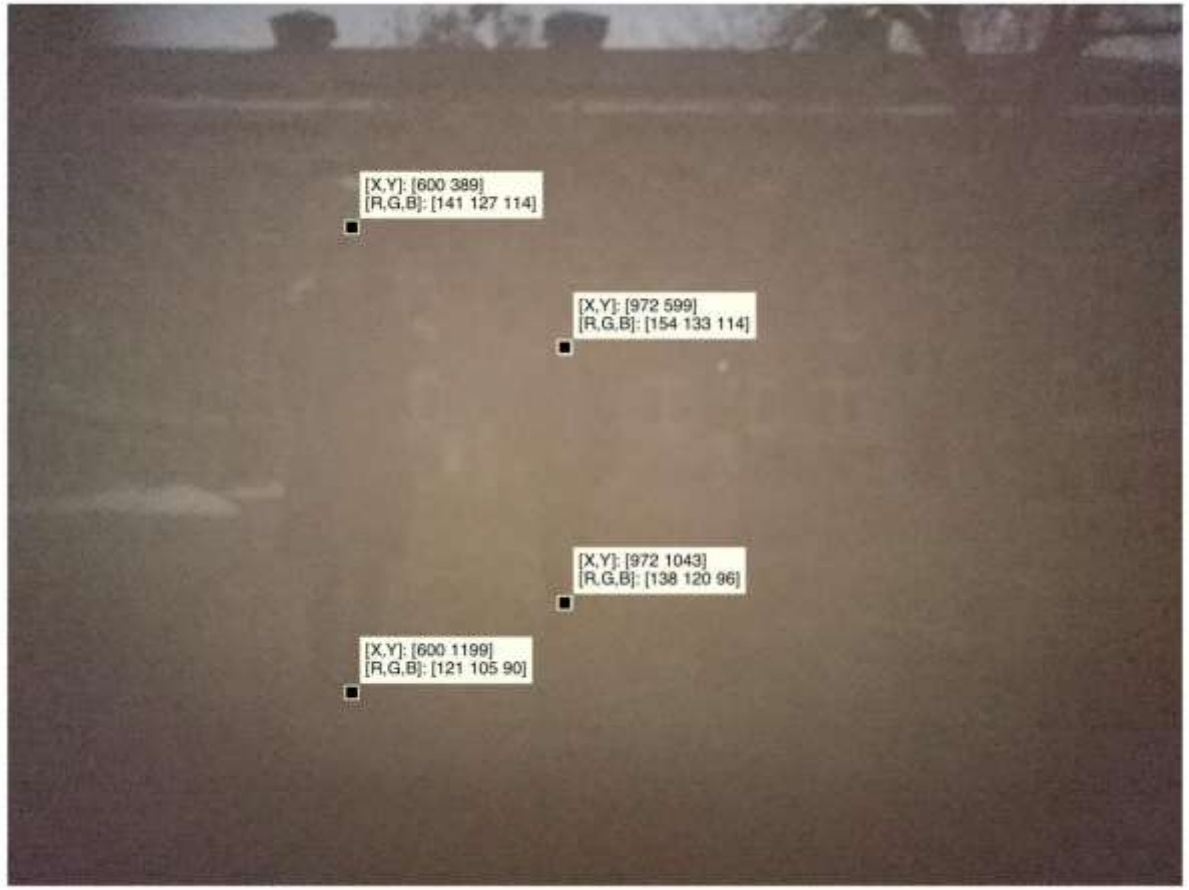
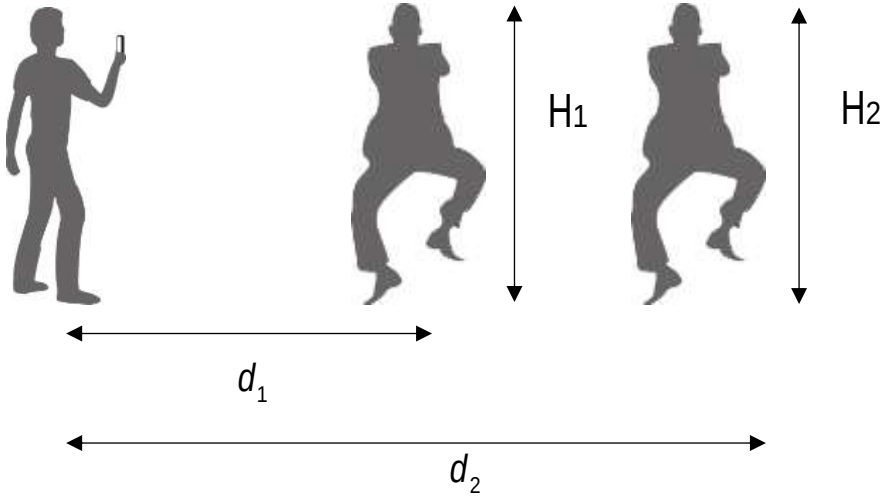


$f = 2017.43\text{pix}$ $H_1 = 1.6\text{m}$ $d_1 = 3.99\text{m}$

HW #1 Camera Obscura and Dolly Zoom



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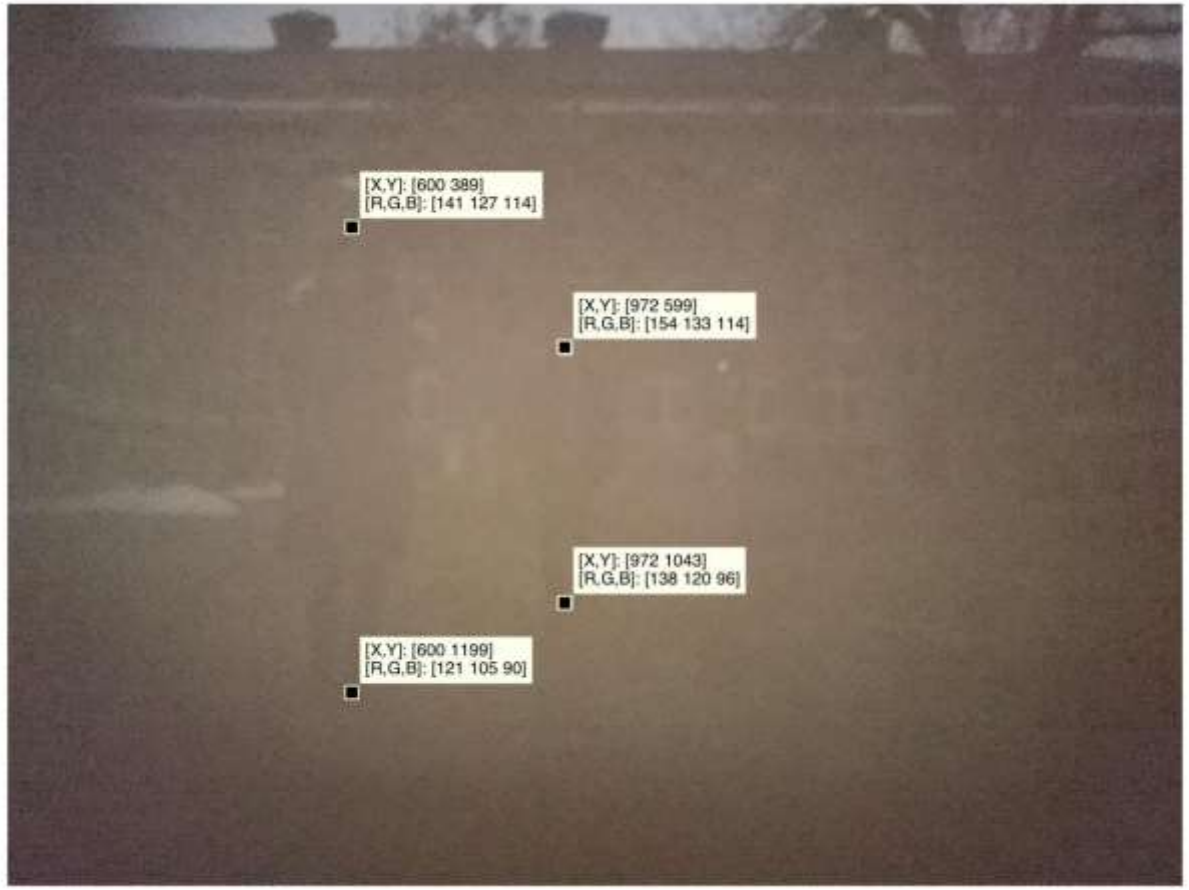
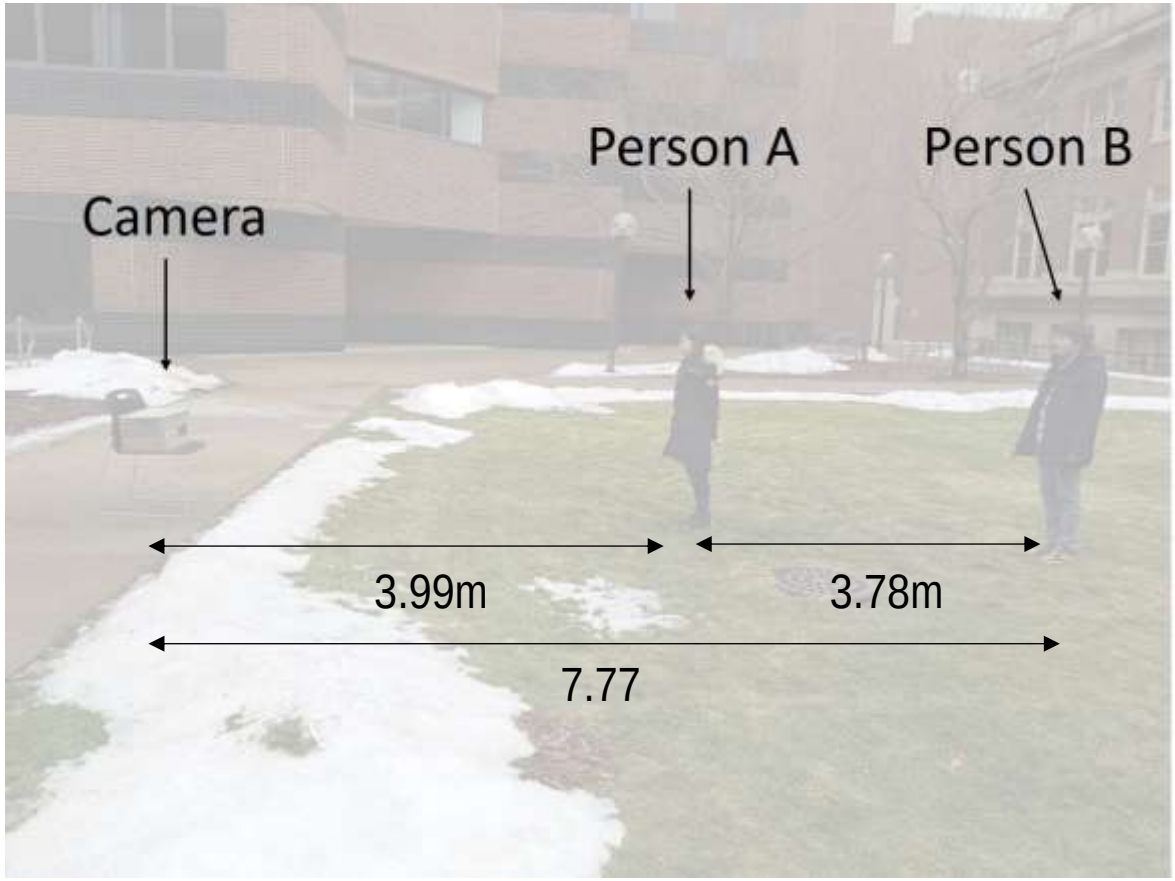
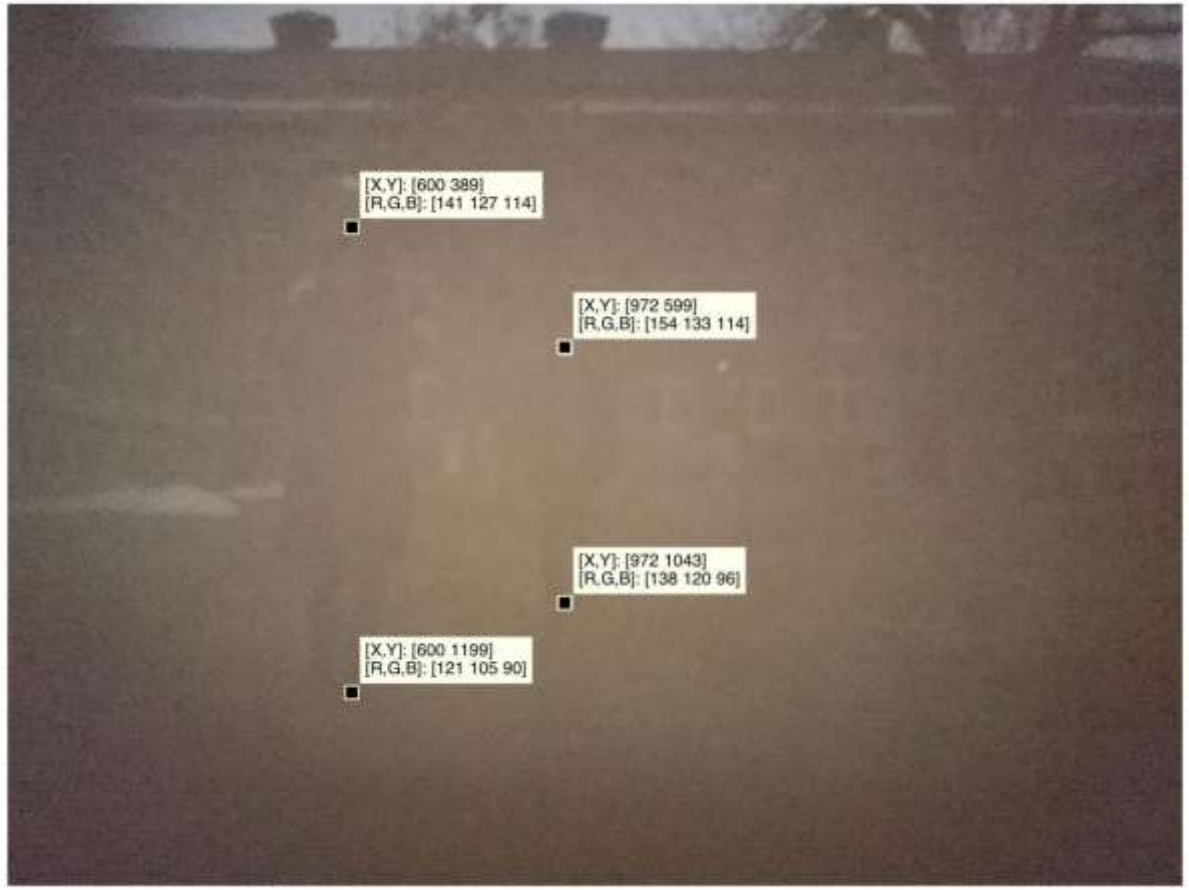


$f = 2017.43\,\text{pix}$ $H_2 = 1.71\text{m}$

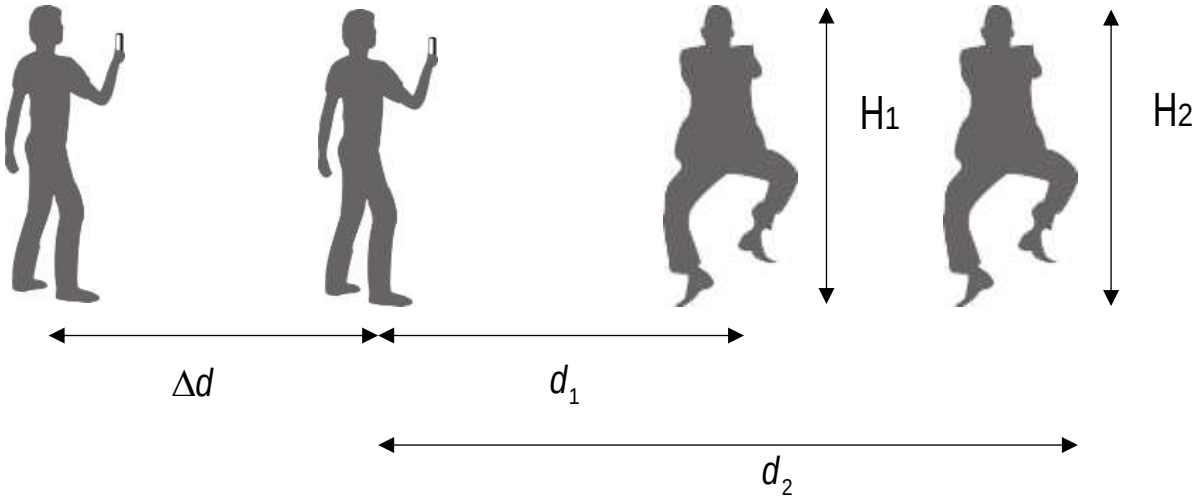
HW #1 Camera Obscura and Dolly Zoom



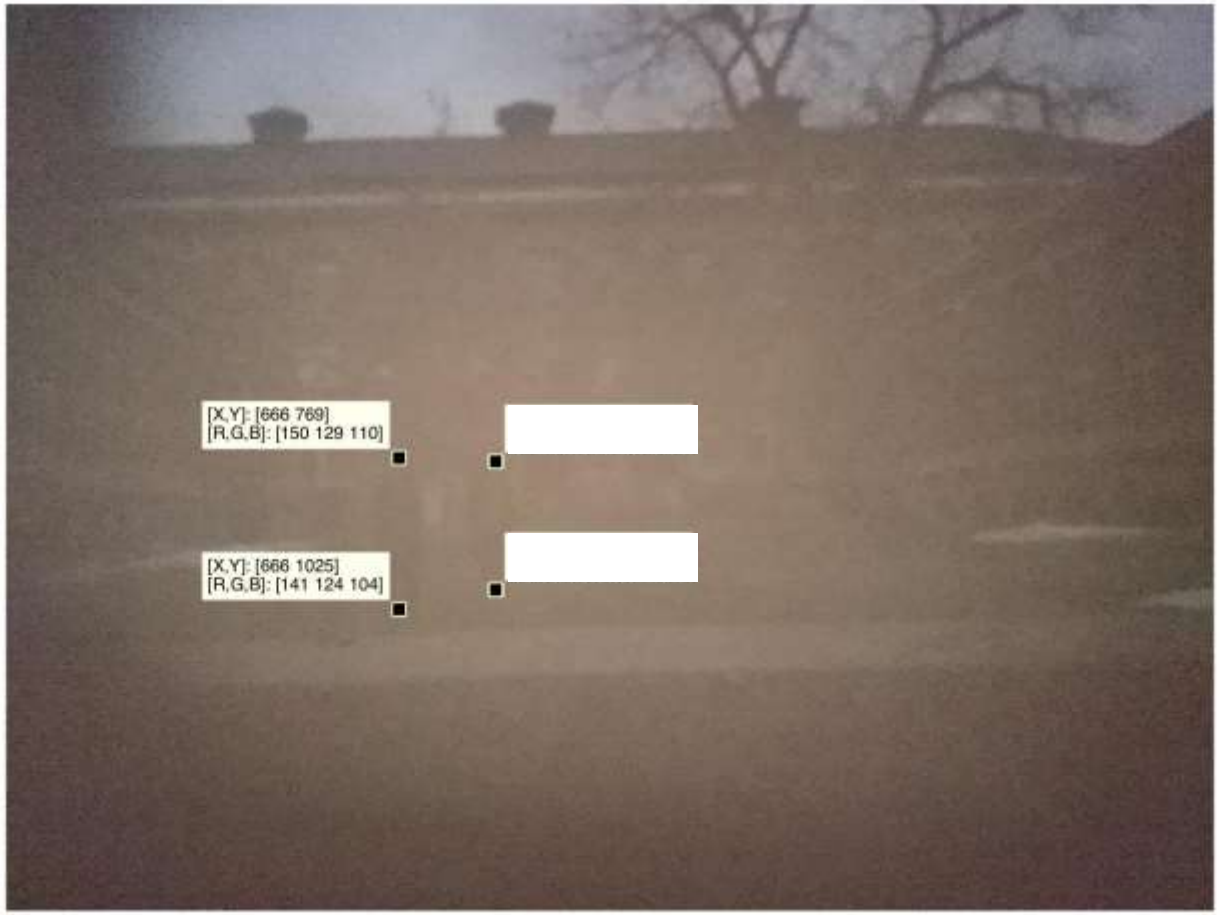


$f = 2017.43\,\text{pix}$ $H_2 = 1.71\text{m}$ $d_2 = 7.77\text{m}$

HW #1 Camera Obscura and Dolly Zoom

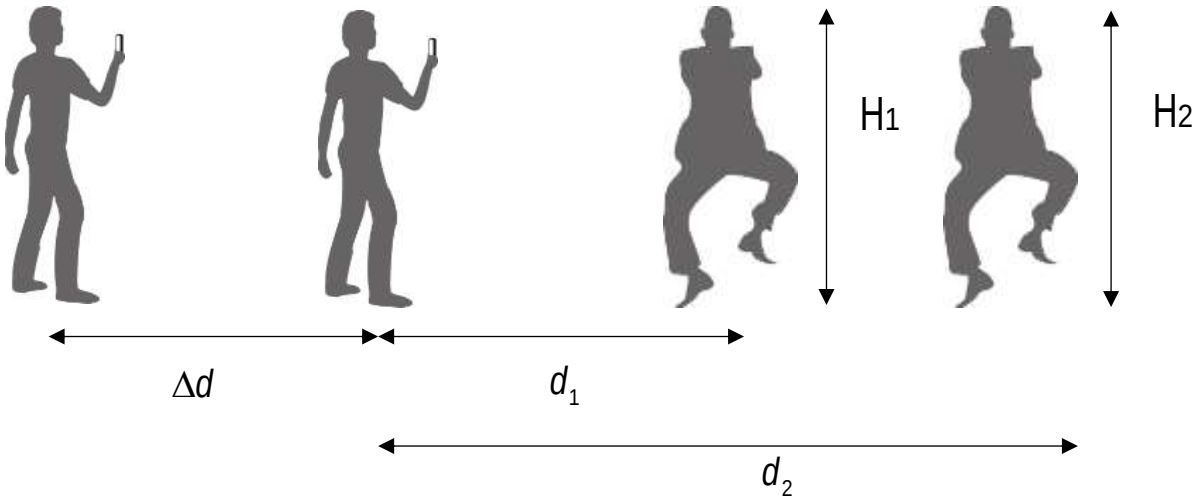


1) Take a photo of two persons
2) Take another photo of them after moving back



$f = 2017.43\,\text{pix} \quad H_1 = 1.6\,\text{m}$

HW #1 Camera Obscura and Dolly Zoom



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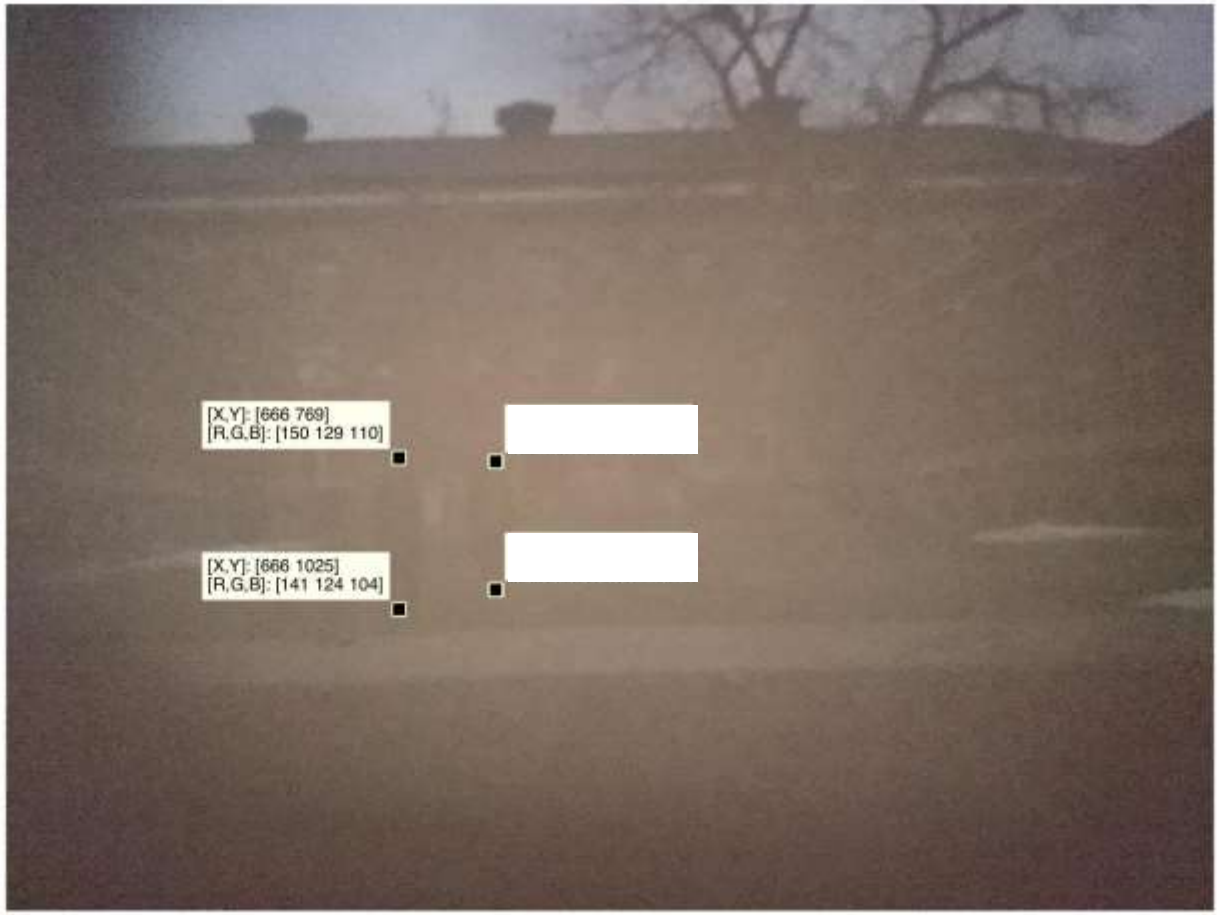
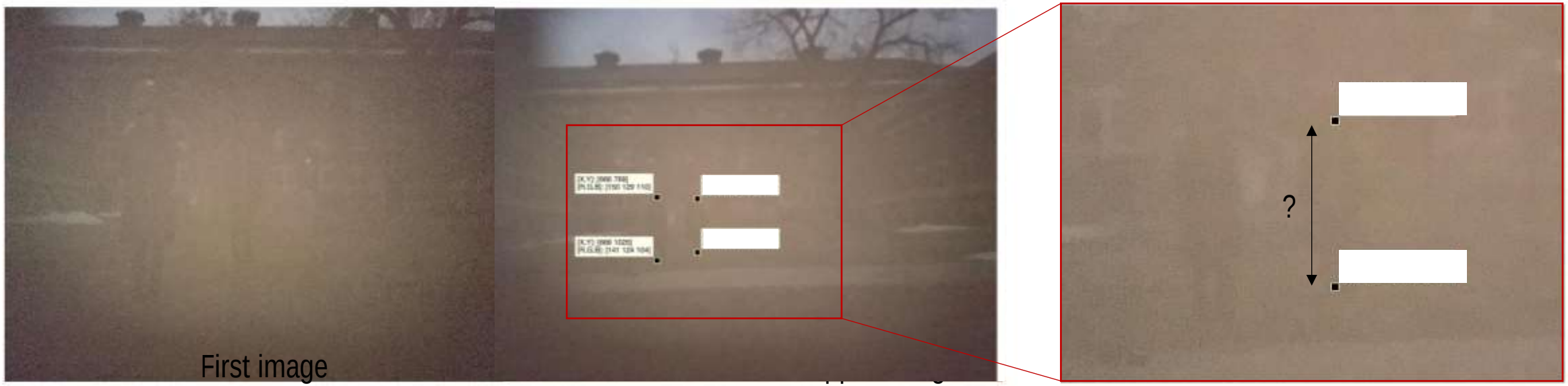


$f = 2017.43\text{pix}$ $H_1 = 1.6\text{m}$ $\Delta d + d_1 = 12.6\text{m}$

$\Delta d + d_2 = 16.38\text{m}$

HW #1 Camera Obscura and Dolly Zoom



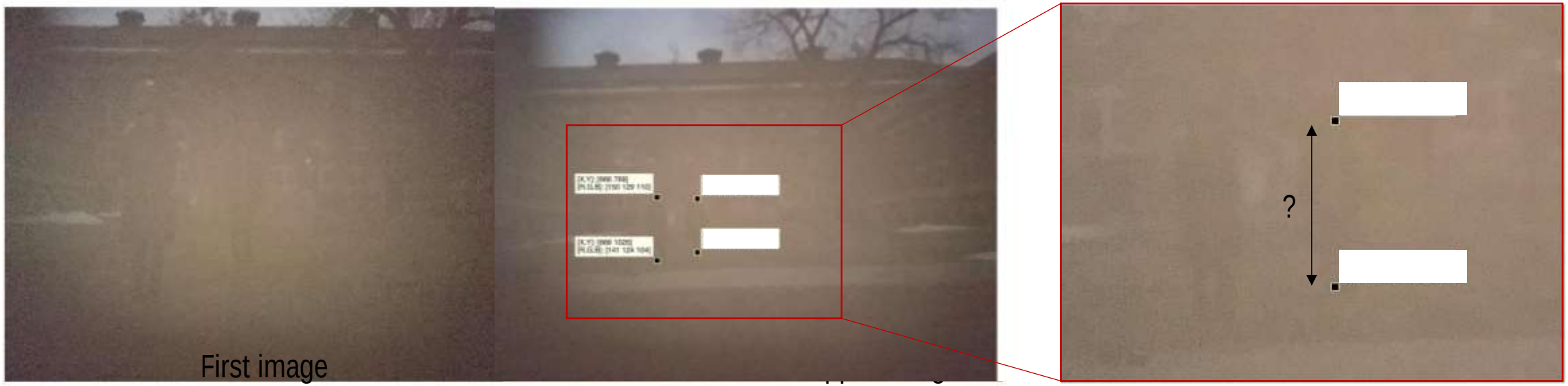
1) Take a photo of two persons
2) Take another photo of them after moving back
3) Scale up and crop the second image such that h_1 remains the same.
4) Predict h_2

$$f_2 = 2017.43\frac{810}{256} = 6383.27\,\text{pix}$$

$$\Delta d + d_2 = 16.38\,\text{m}$$

$$H_2 = 1.71\,\text{m}$$

HW #1 Camera Obscura and Dolly Zoom



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$$f_2 = 2017.43\frac{810}{256} = 6383.27\,\text{pix}$$

$$\Delta d + d_2 = 16.38\,\text{m}$$

$$H_2 = 1.71\,\text{m}$$

$$h_2 = 666.3\,\text{pix}$$

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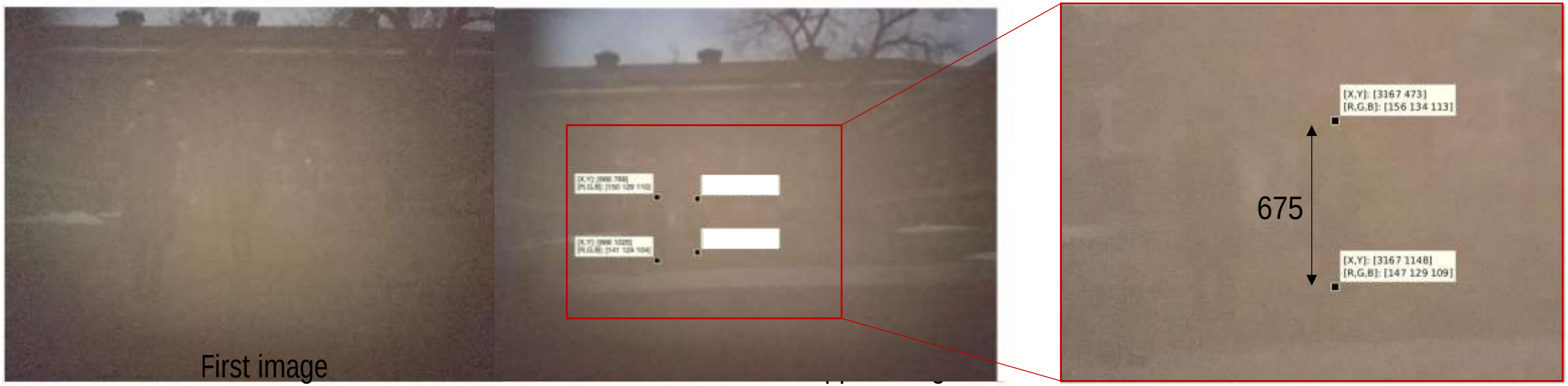

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2) Take another photo of them after moving back
3) Scale up and crop the second image such that h_1 remains the same.
4) Predict h_2

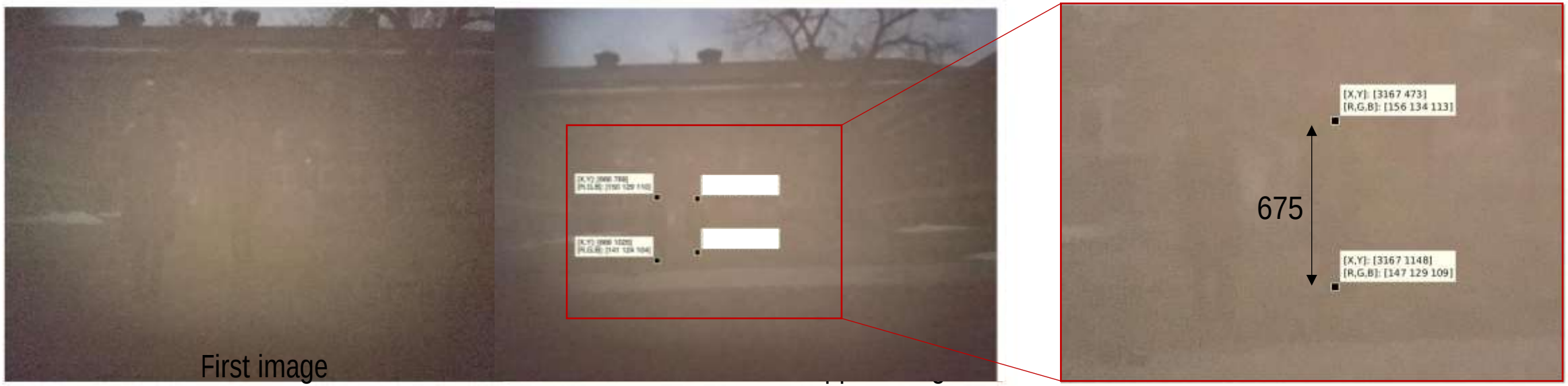
$$f_2 = 2017.43\frac{810}{256} = 6383.27\,\text{pix}$$

$$\Delta d + d_2 = 16.38\,\text{m}$$

$$H_2 = 1.71\,\text{m}$$

$$h_2 = 666.3\,\text{pix}$$

HW #1 Camera Obscura and Dolly Zoom



1) Take a photo of two persons
2) Take another photo of them after moving back
3) Scale up and crop the second image such that h_1 remains the same.
4) Predict h_2

$$f_2 = 2017.43\frac{810}{256} = 6383.27\,\text{pix}$$

$$\Delta d + d_2 = 16.38\,\text{m}$$

$$H_2 = 1.71\,\text{m}$$

$$h_2 = 666.3\,\text{pix}$$