

# CMSC733: Computer Processing of Pictorial Information

## Homework 2: Estimating height from a single image

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**Abstract**—Given the height of an object in the image, find the height of the door.

### I. PROCEDURE

#### A. Finding the vanishing points in the image

Draw the lines on a set of lines (that are parallel in the Orthographic view). Extend the lines to join them. The intersection of such two lines is a vanishing point. Let's call this *point A*.

#### B. Finding a vanishing point on another axis to get the horizon

Similarly, draw parallel lines on another axis (in orthographic view). Get another vanishing point, say *point B*. Join *point A* and *point B* to get the horizon. [1]



Fig. 1. Finding the horizon[1]

#### C. Similarly, find the vanishing points in Z

#### D. Find the cross ratio to estimate the height of the door [2] [3]

### II. CONCLUSION

The estimated height of the AVW door: 2373.1 mm.  
Estimated height of the camera: 1651mm

### REFERENCES

- [1] Crispys perspective tips: Studying photos - finding the horizon line and vanishing points: <http://crispyghee.tumblr.com/post/42009835585/crispys-perspective-tips-studying-photos>.
- [2] Single view metrology, engr illinois: [http://web.engr.illinois.edu/slazebni/spring14/lec14\\_single\\_view.pdf](http://web.engr.illinois.edu/slazebni/spring14/lec14_single_view.pdf).
- [3] Single view metrology, cmu: <https://www.cs.cmu.edu/ph/869/www/notes/criminisi.pdf>.

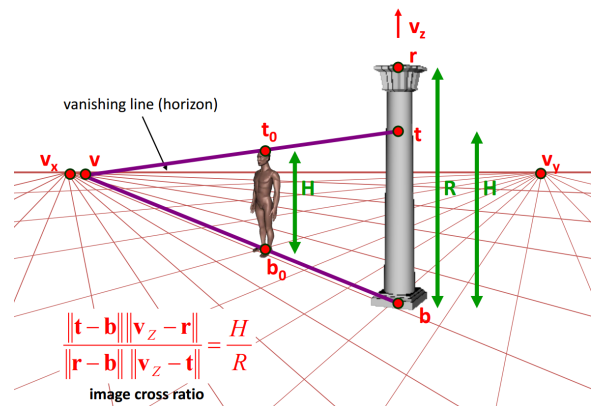


Fig. 2. Calculating the cross ratio[2]



Fig. 3. Horizon and Vanishing points in test image