

1. detect_lines()
 - a. Given the image, run it through canney edge detection and houghlinesP to get the edges from the images.
2. get_pairwise_intersections()
 - a. Given the detected lines in the image, get the cross product of each pair of lines.
 - b. Check if intersection point lines at infinity ($z=0$).
 - If yes, discard
 - If no, save point into the intersections array.
3. get_support_mtx()
 - a. For each intersection point(i), calculate the shortest distance to each line(j).

$$\text{distance}(ax + by + c = 0, (x_0, y_0)) = \frac{|ax_0 + by_0 + c|}{\sqrt{a^2 + b^2}}$$

 - Using formula
 - b. For each distance calculated, check if within the max threshold value.
 - If yes, set support matrix[i][j] = 1.
 - Else, set support matrix[i][j] = 0.
4. get_vanishing_pts()
 - a. Given the support matrix, find the intersection with the most supporting lines (row with most 1s).
 - b. Set the columns of the support matrix where the chosen intersection has the value ==1 to 0.
 - c. Repeat process for the given number of vanishing points needed.
5. get_vanishing_line()
 - a. Given 2 vanishing points, the vanishing line is the cross products of these 2 vanishing points.
6. get_target_height()
 - a. Calculate vanishing point $u = (b_1 \times b_2) \times I$ and scale to form $(x, y, 1)$.
 - b. Calculate transferred point $t'_1 = (t_1 \times u) \times (v \times b_2)$ and scale to form $(x, y, 1)$.
 - c. Calculate distances of t'_1, t_2, v from b_2 using $\sqrt{\Delta x^2 + \Delta y^2}$
 - d. Calculate distance ratio, $\frac{d_1}{d_2} = \frac{t'_1(v-t_2)}{t_2(v-t'_1)}$
 - e. Calculate target height by dividing query distance by ratio.