

Programming Assignment #3

RANSAC

Due: November 10

For this assignment you will implement RANSAC for finding lines in binary images. Please turn in the solutions for the problems below together with a printed copy of your source code.

Finding Lines

A line is defined by three parameters (a, b, c) such that the points in the line satisfy $ax + by + c = 0$.

Problem 1 Let $p_1 = (x_1, y_1)$ and $p_2 = (x_2, y_2)$ be two different points. What is the equation for the line that goes through p_1 and p_2 ?

Problem 2 Let $p = (x, y)$ be a point. What is the distance from p to its closest point on the line defined by parameters (a, b, c) ?

Problem 3 Write a function that draws a line (a, b, c) in an image. Make sure your function can draw lines in any orientation (including horizontal and vertical) without leaving holes.

Problem 4 Write a program that finds lines in a binary image using RANSAC. The program should generate an output image by drawing the lines that are found. You should run it on the test images provided in the class website and submit the results with your writeup.