CSE 573 - CVIP FINAL PROJECT STATUS REPORT

Hough Transform to detect circles

Project Team Information:

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Brief Description:

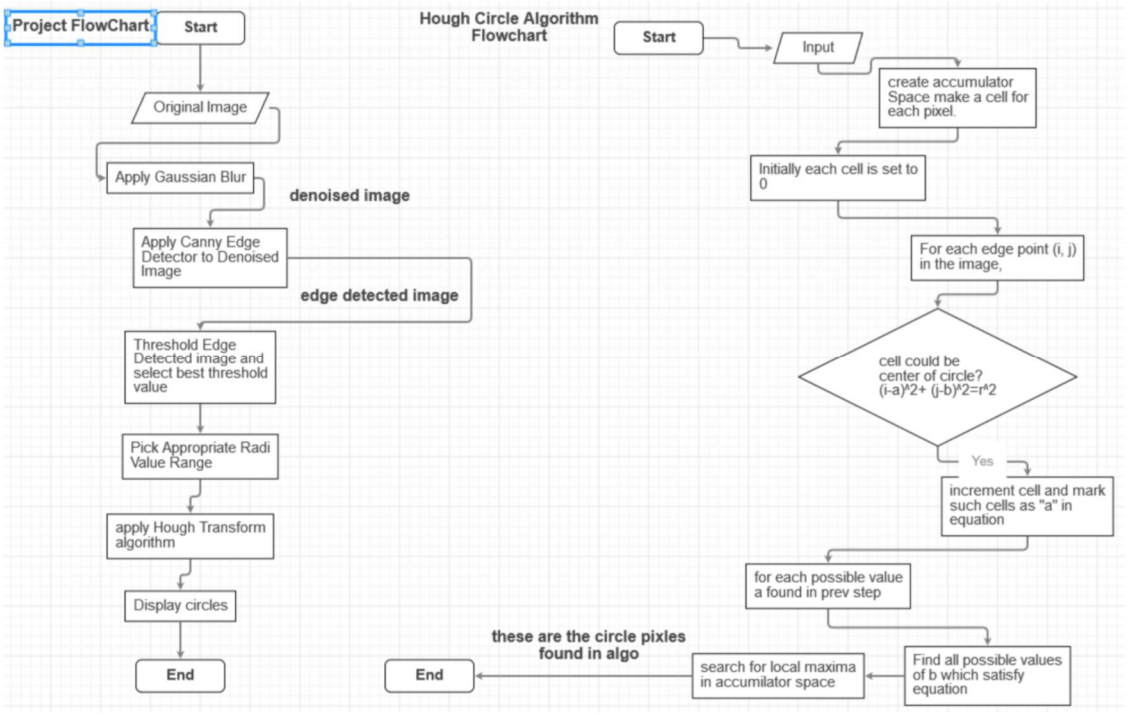
The basic idea behind this project is to use the techniques and concepts learned in class to successfully execute Hough transform for detecting circles given in an image. We will be given a random image containing circles and we will be required to detect all the circles present in the image using Hough Transform algorithm. We are expected to successfully build the Hough transform algorithm from scratch using the information we have learned from this class over the course of the semester. The main objective of this project will be test our knowledge of the key concepts in image processing and to help us understand the intricate working of the various techniques involved in computer vision.

We will be making use of various image processing libraries such as open cv in python or java. We will be required to understand various smoothing and edge detection techniques, applying Gaussian filters, using the concept of thresholding in an image, and making use of accumulator arrays which form the crux of the Hough transform.

Steps:

1. Apply Gaussian Blur to remove noise from the image
2. Edge Detection (Sobel Filter or Canny Edge)
3. Threshold the image and select the best threshold value
4. Pick appropriate radii values range
5. Apply Hough Transform Algorithm to detect circles
6. Display the circles detected over the image
7. Analyse the performance of your circle detector and note the steps required to improve its performance
8. Compile final result in project report
9. Debug the project code and optimize the efficiency of the project.

Flowchart:



Workload Partition:

Since there are no multiple major parts of the project and there is only one central part to be completed, that is the Hough Transform Algorithm for detecting circles, both members will be working together to achieve that goal.

We have decided not to break up the entire project into two separate parts but would rather work on the same issues at the same time to find a more efficient and effective solution to the given problem.

As of now, we are planning to first attack the left side of the flowchart as one task, and then work on the second side as a different task.

Deadlines:

November 10 – November 16: Start Reading through papers and materials and plan what the course of action will be to successfully execute the project.

November 17 – November 24: Prepare status report and outline the exact steps and procedure to be followed over the course of the next month.

November 25 – December 1: Rough Start and Knowledge-based adjustment of the platform and start coding and implementation of the project.

December 2 – December 8 – Implement the Hough circle transform using accumulator array. Also read papers and perform a working study to see how the bonus part can be completed.

December 9 – December 13: Final adjustments and tweaks to be performed, and also prepare the final project report and complete all the tasks in the project.