Mid-Term Project Assignment Report

Feet Size Measurement using Homography and Pixel Per Metric

BY

Rohit Das

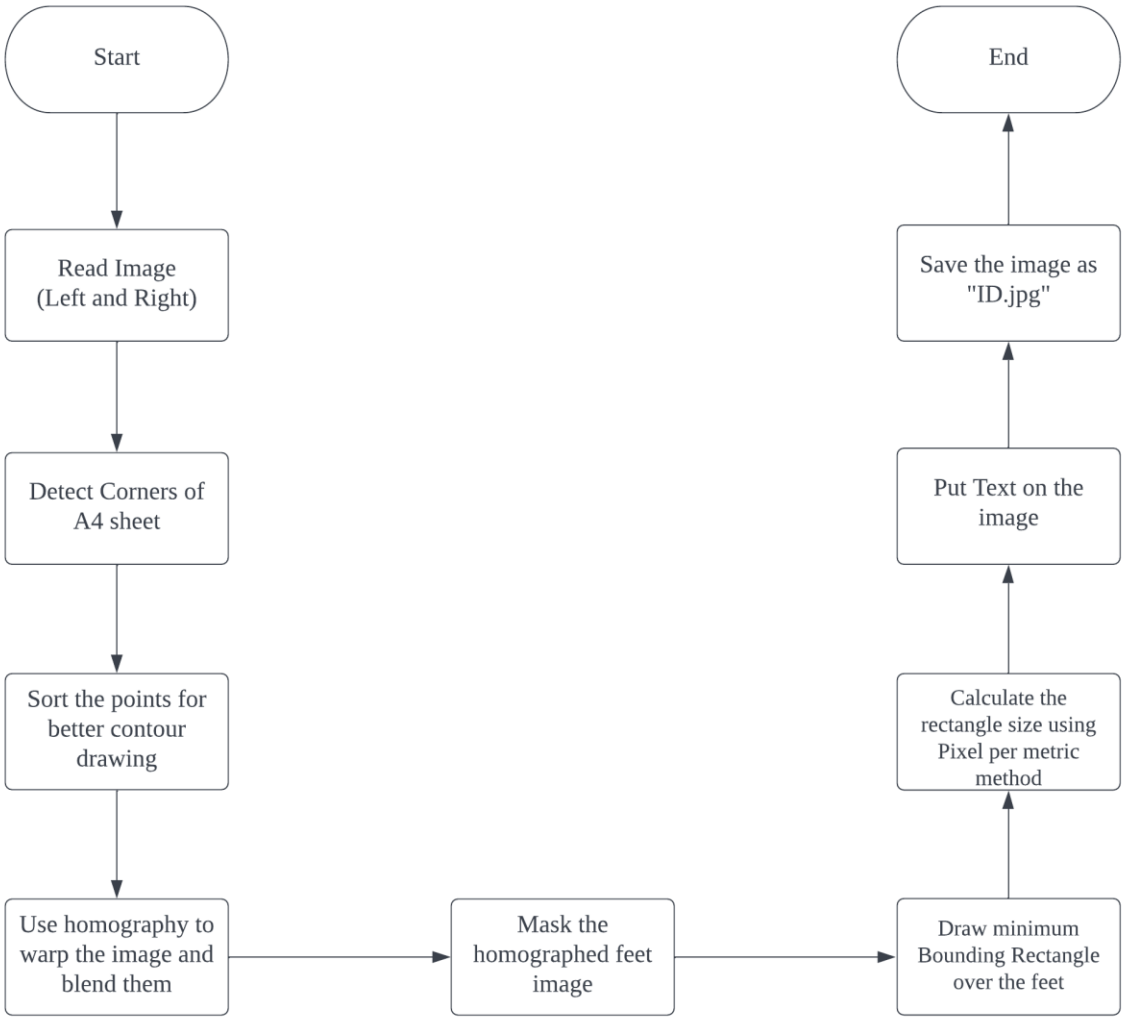
National Taiwan Normal University

61047086s@ntnu.edu.tw , +886-905023713

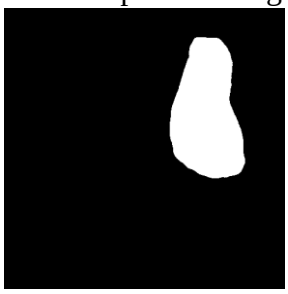
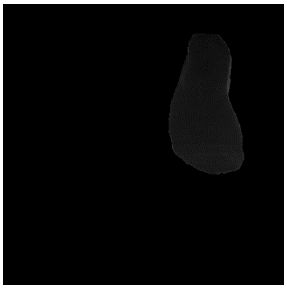
Introduction:

This is a mid-term assignment for finding the size of feet using homography and calculate the dimension using pixel-per-metric ratio.

Workflow:

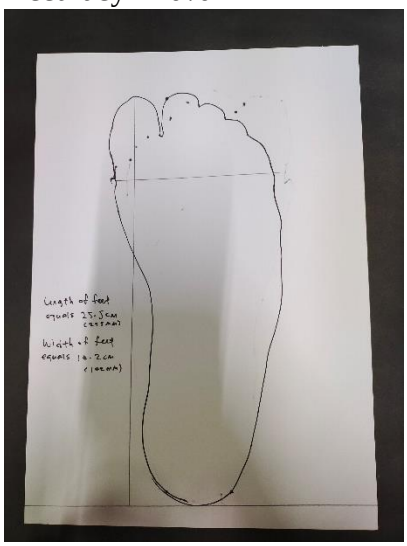


Challenges:

1. Environment issues: Since the floor of my room has square tiles and too much textures, it was difficult to detect the A4 sheet.
   Solution: Used a black sheet as a background and put the A4 sheet above it.
   
   
2. Blending issues: Poisson blending was my initial thought but it was not good enough.
   Solution: addWeighted function of OpenCV helped me in this situation.
   
3. Feet mask from homographed Image: The above homographed image pose a big problem since the overlapping images creates a shadow which makes it difficult to remove the feet.
   Solution: use Thresholding and find the threshold by trial and error. Then apply bitwise operation to get the mask.
   
   
4. Size of the Feet: For this problem I created a minimum bounding rectangle over the feet. Then I used pixel per metric ratio to find the size.
   

Result:

Length of Feet in Real World = 255 mm
Length of Feet in the image = 266 mm
Accuracy +95%
Width of Feet in Real World = 102 mm
Width of Feet in the image = 143 mm
Accuracy +70%



Conclusion:

I am satisfied with the result. Though I believe I could make the codes much simpler. The total duration for completing this project took 7 days. These kinds of problems relate more to Photogrammetry. I really enjoyed doing this assignment. I thank professor for giving us this assignment.