

Augmented Reality: OpenCV/Python for Anatomical Recognition



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Project Description:

CannyCam is a webcam video stream that isolates and identifies anatomical parts.

Use Case:

Doctor diagnosing patient

- Identify body part
- Analyze/diagnose patient

Software:

OpenCV and Python

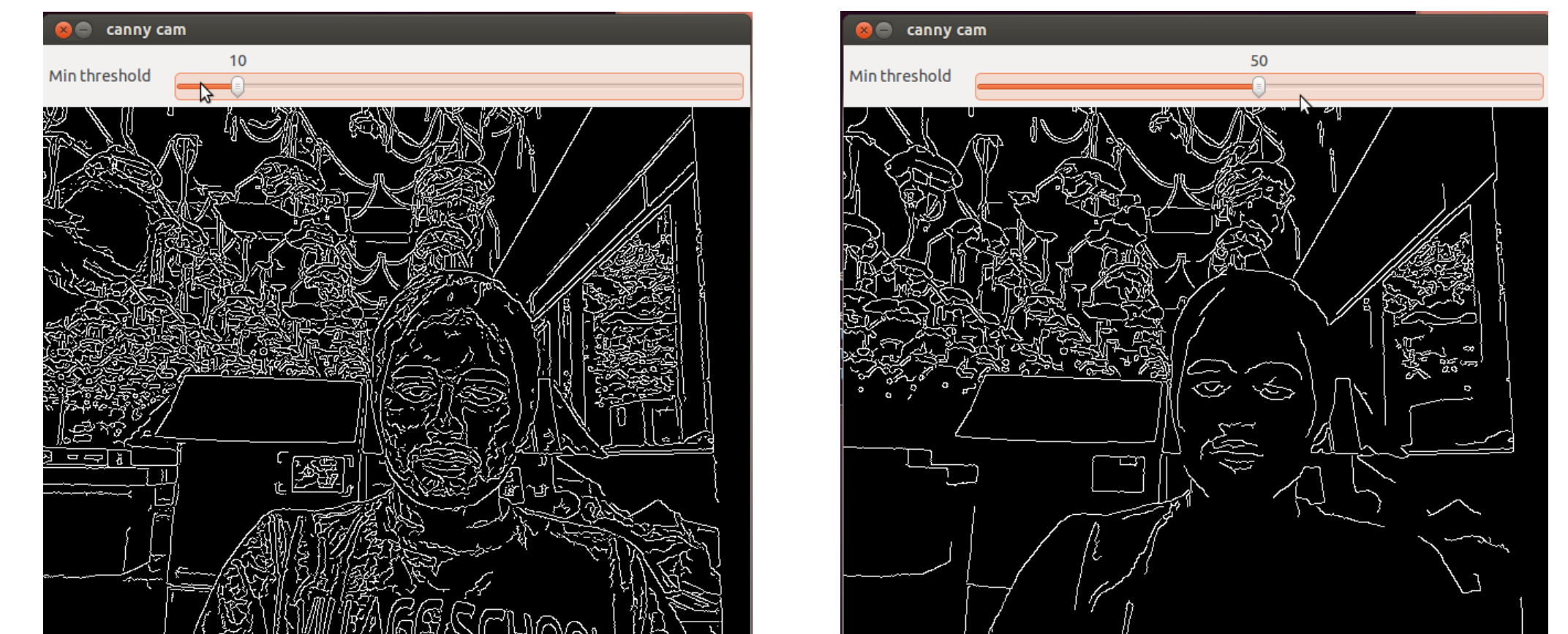
Anatomical Identification: Canny Edge Detection

- Removes noise from image, giving black background and white outline. Accentuates sharp edges in the image, making it very easy to detect a target.

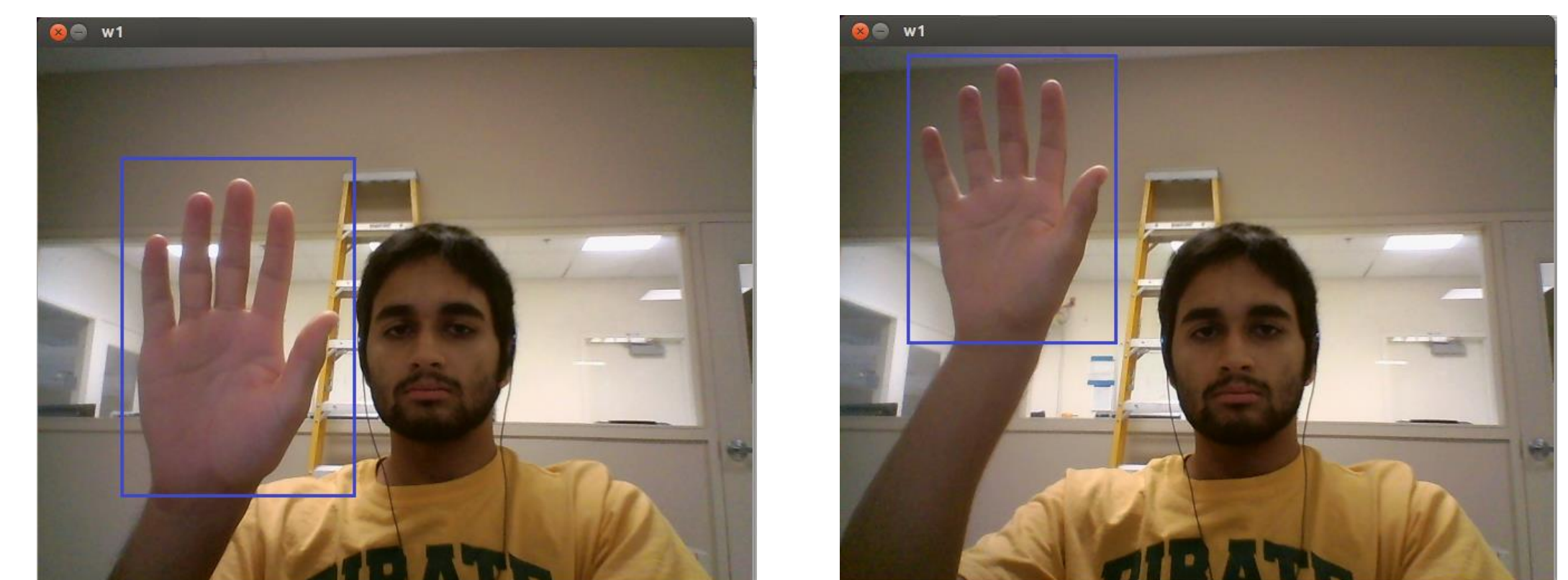
Haar Cascade Image Detection

- Identifies Haar-like features: distinct visual features of each body part (i.e. fingers have gaps between each other, etc.).
- Detects image, given a training set of positive images (pictures of the target) and negative images (pictures not containing target, should be images of the physical background used for the experiment).

This puts a rectangle around the target, effectively identifying it. Users will see the rectangle on top of their unadulterated image before Canny Edge detection is run, although image detection is done behind the scenes with Canny/Haar algorithms. This is done for aesthetic output.



Canny Edge Detection



Haar Cascade Image Detection after Canny Edge Detection, with targeting rectangle

Future Work

Detect more than just hands and torso

- Knee, elbow, etc.

Develop for portable displays

- Android Smartphone/HUD getup
- Google Glass

Implement hospital-wide database

- Enriches training base, more accurate image detection

