Background Subtraction

By - IIITDM

How to run the project

Clone from github :

git clone https://github.com/xbassi/RealTimeBgSubtraction

cd RealTimeBgSubtraction

Install all requirements from requirements.txt

python3.6 src/app_pt.py --file camera/<video_file_path>

Open Browser and go to: http://localhost:5000

Defining the problem statement

1. “Only a Person(Lecturer) should be considered for the foreground.” So segmenting a person from the whole image should solve the problem.

2. “Multiple people are present.” Only consider the closest person.

3. “Very small segments can be removed”. Problem of de-noising the image.

Approach

1. Server
    a. Takes image stream from backend(Saved video/Camera feed), serves the user with final masked frame.
2. Model
    a. Segmentation Block
    b. Feathering Block
    c. Trained on Human Matting Dataset - (Close-up single person images with segments)
3. Image processing techniques
    a. Removal of extra blobs detected as Noise. Currently using connected components by OpenCV.
    b. Mask averaging over the sequence of frames. It removed flickering and increased stability.

Results - DEMO

1. Phase 1 - Green Screen
2. Phase 2 - Sample Video

Hardware Specifications

1. CPU: 2.6GHz Intel Core i7-6700HQ (quad-core, 6MB cache, up to 3.5GHz with Turbo Boost)
2. Graphics: Nvidia GeForce GTX 960M (4GB DDR5 VRAM)
3. RAM: 16GB DDR4 2133MHz.

Final results shows video streaming at 25 FPS on client's browser.