



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.

```
(Unacademy) prince@home:~/SkillEnza/Unacademy/RealTimeBgSubtraction$ nvidia-smi
Sun Aug  4 07:02:58 2019

+-----+
| NVIDIA-SMI 418.56              Driver Version: 418.56          CUDA Version: 10.1         |
+-----+-----+
| GPU  Name            Persistence-M| Bus-Id        Disp.A | Volatile Uncorr. ECC |
| Fan  Temp  Perf    Pwr:Usage/Cap|      Memory-Usage | GPU-Util  Compute M. |
+-----+-----+
|   0  GeForce GTX 960M      Off   | 00000000:01:00:0 | Off           N/A   |
| N/A   46C    P0     N/A /  N/A   |  766MiB /  4046MiB |    0%      Default  |
+-----+-----+

+-----+
| Processes:                                                       GPU Memory |
|  GPU       PID    Type   Process name                               Usage      |
+-----+-----+
|    0      28391    C       python                               377MiB     |
|    0      28440    C   ...e/prince/SkillEnza/Unacademy/bin/python 377MiB     |
+-----+

(Unacademy) prince@home:~/SkillEnza/Unacademy/RealTimeBgSubtraction$
```