

Pseudo Code For Facial Adaptive Learning Algorithm

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Abstract—This note is a collection of some of Pseudo Code that I have created for the on-going research and development work in facial adaptive learning technique.

I. ADAPTIVE LEARNING ALGORITHM

In this note, the algorithm for facial adaptive learning is discussed below.

First, define $I(x, y; t_i)$ as input video frame, which can also be denoted as I_i , hence, for the classes of positive, negative, and anchor image, we introduce I_i^p , I_i^n and I_i^a notation respectively. Note in the conference paper on Facenet published by google team, the above notation can be written as x_i^p , x_i^n and x_i^a as well.

Now, define $P_i(w_i, b_i)$ for $i=1, 2$ for the execution of facenet based facial recognition algorithm. $P_1(w_i, b_i)$ is for the process with an original image dataset Ω , while $P_2(w_i, b_i)$ is for the process with new added images $I(x, y; t_i) \in \Omega_a$. Here we have denoted Ω_a as the enlarged image dataset.

The 1st Pseudo Code.

Algorithm 1 Adaptive Learning

Require: input video frame $I(x, y; t_i)$

Ensure: Start 2 Processes $P_i(w_i, b_i)$ for $i=1, 2$;

```
while  $P_1(w_i, b_i) \wedge P_2(w_i, b_i)$  do
  if flag_adaptive then
    Run  $P_2(w_i, b_i)$  with new added images  $I(x, y; t_i) \in \Omega_a$ 
  if flag_update then
    Update  $P_1(w_i, b_i)$ 
  else
    Run  $P_2(w_i, b_i)$  with new added images  $I(x, y; t_i) \in \Omega_a$ 
  end if
else
  Run  $P_1(w_i, b_i)$  with original image dataset  $\Omega$ 
end if
end while
```

The 2nd Pseudo Code. Now the algorithm for anchor image selection.

The 3rd Pseudo Code. Now, for new image dataset update

Algorithm 2 Selection of anchor $I^a(x, y; t_i)$

Require: input video frame $I(x, y; t_i)$

Ensure: Start 2 Processes $P_i(w_i, b_i)$ for $i=1, 2$;

```
while  $P_1(w_i, b_i) \wedge P_2(w_i, b_i)$  do
  if flag_adaptive then
    run  $P_2(w_i, b_i)$  with new added images  $I(x, y; t_i) \in \Omega_a$ 
  if flag_update then
    update  $P_1(w_i, b_i)$ 
  else
    run  $P_2(w_i, b_i)$  with new added images  $I(x, y; t_i) \in \Omega_a$ 
  end if
else
  run  $P_1(w_i, b_i)$  with original image dataset  $\Omega$ 
end if
end while
```

Algorithm 3 Update image dataset Ω_a

Require: input video frame $I(x, y; t_i)$

Ensure: Start Processes $P_1(w_i, b_i)$;

```
while  $P_1(w_i, b_i)$  do
  if flag_falseDetection  $\wedge$  flag_indConfirmation then
    Select  $I(x, y; t_i)$  make  $I(x, y; t_i) \in \Omega_a$ 
    Update  $\Omega \rightarrow \Omega_a$ 
  end if
end while
```

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REFERENCES

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