

Execution Steps and Results

1. OpenVINO environment is initialized using setupvars.sh.

- vainfo confirms the system supports Intel iHD VAAPI driver, required for GPU acceleration.
- Docker command to run DL Streamer pipeline container with GPU access is prepared.
- Purpose: Verifies that Intel GPU is available and sets up Docker environment for hardware-accelerated inference.

```
dlstreamer@snehal-Latitude-3420: ~  
[setupvars.sh] OpenVINO environment initialized  
snehal@snehal-Latitude-3420:~$ vainfo | grep "iHD"  
libva info: VA-API version 1.22.0  
libva info: Trying to open /usr/lib/x86_64-linux-gnu/dri/iHD_drv_video.so  
libva info: Found init function __vaDriverInit_1_22  
libva info: va_openDriver() returns 0  
vainfo: Driver version: Intel iHD driver for Intel(R) Gen Graphics - 25.2.1 ()  
snehal@snehal-Latitude-3420:~$ xhost +local:root  
  
sudo docker run -it --rm \  
  --device /dev/dri \  
  --net=host \  
  -e DISPLAY=$DISPLAY \  
  -v /tmp/.X11-unix:/tmp/.X11-unix \  
  -v ~/dlstreamer_pipeline/models:/models \  
  intel/dlstreamer:2025.0.1.3-dev-ubuntu22  
non-network local connections being added to access control list  
[sudo] password for snehal:  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
dlstreamer@snehal-Latitude-3420:~$ ls /dev/dri  
card0  renderD128  
dlstreamer@snehal-Latitude-3420:~$ vainfo | grep iHD
```

2. Downloading Model Proc File

- model_proc files define how to preprocess inputs and interpret outputs (for GStreamer plugins).

```
snehal@snehal-Latitude-3420:~/Desktop$ mkdir -p ~/dlstreamer_pipeline/models/model_proc  
  
wget -O ~/dlstreamer_pipeline/models/model_proc/face-reidentification-retail-0095.json \  
https://raw.githubusercontent.com/openvinotoolkit/dlstreamer/master/samples/gstreamer/model_proc/face-reidentification-retail-0095.json  
--2025-06-30 15:07:45-- https://raw.githubusercontent.com/openvinotoolkit/dlstreamer/master/samples/gstreamer/model_proc/face-reidentification-retail-0095.json  
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 2606:50c0:8002::154, 2606:50c0:8003::154, 2606:50c0:8000::154, ...  
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|2606:50c0:8002::154|:443... connected.  
HTTP request sent, awaiting response... 404 Not Found  
2025-06-30 15:07:46 ERROR 404: Not Found.  
  
snehal@snehal-Latitude-3420:~/Desktop$ ls -l ~/dlstreamer_pipeline/models/model_proc/face-reidentification-retail-0095.json  
head ~/dlstreamer_pipeline/models/model_proc/face-reidentification-retail-0095.json  
-rw-rw-r-- 1 snehal snehal 0 Jun 30 15:07 /home/snehal/dlstreamer_pipeline/models/model_proc/face-reidentification-retail-0095.json  
snehal@snehal-Latitude-3420:~/Desktop$
```

3. The age-gender-recognition-retail-0013 model is downloaded using omz_downloader. Enables age and gender classification for detected faces in the pipeline.

```
snehal@snehal-Latitude-3420:~/Desktop$ omz_downloader --name age-gender-recognition-retail-0013 -o ~/dlstreamer_pipeline/models
#####| | Downloading age-gender-recognition-retail-0013 | |#####

===== Downloading /home/snehal/dlstreamer_pipeline/models/intel/age-gender-recognition-retail-0013/FP32/age-gender-recognition-retail-0013.xml
... 100%, 30 KB, 126246 KB/s, 0 seconds passed

===== Downloading /home/snehal/dlstreamer_pipeline/models/intel/age-gender-recognition-retail-0013/FP32/age-gender-recognition-retail-0013.bin
... 100%, 8351 KB, 4364 KB/s, 1 seconds passed

===== Downloading /home/snehal/dlstreamer_pipeline/models/intel/age-gender-recognition-retail-0013/FP16/age-gender-recognition-retail-0013.xml
... 100%, 42 KB, 104 KB/s, 0 seconds passed

===== Downloading /home/snehal/dlstreamer_pipeline/models/intel/age-gender-recognition-retail-0013/FP16/age-gender-recognition-retail-0013.bin
... 100%, 4175 KB, 2756 KB/s, 1 seconds passed

===== Downloading /home/snehal/dlstreamer_pipeline/models/intel/age-gender-recognition-retail-0013/FP16-INT8/age-gender-recognition-retail-0013.xml
... 100%, 69 KB, 131 KB/s, 0 seconds passed

===== Downloading /home/snehal/dlstreamer_pipeline/models/intel/age-gender-recognition-retail-0013/FP16-INT8/age-gender-recognition-retail-0013.bin
... 100%, 2099 KB, 2330 KB/s, 0 seconds passed

snehal@snehal-Latitude-3420:~/Desktop$ cp ~/dlstreamer_pipeline/models/intel/age-gender-recognition-retail-0013/FP32/* ~/dlstreamer_pipeline/models/
snehal@snehal-Latitude-3420:~/Desktop$ ls ~/dlstreamer_pipeline/models/age-gender-recognition-retail-0013.*
/home/snehal/dlstreamer_pipeline/models/age-gender-recognition-retail-0013.bin
/home/snehal/dlstreamer_pipeline/models/age-gender-recognition-retail-0013.xml
snehal@snehal-Latitude-3420:~/Desktop$
```

4. cat command shows contents of the face-reidentification-retail-0095.json model proc file.
- Includes alignment points for face embeddings and post-processing format as cosine_distance.
 - Purpose: Ensures model_proc file is correct and ready for use with GStreamer's gvaclassify.

```
dlstreamer@snehal-Latitude-3420: ~
card0 renderD128
dlstreamer@snehal-Latitude-3420:~$ vainfo | grep iHD
error: XDG_RUNTIME_DIR not set in the environment.
libva info: VA-API version 1.22.0
libva info: User environment variable requested driver 'iHD'
libva info: Trying to open /usr/lib/x86_64-linux-gnu/dri/iHD_drv_video.so
libva info: Found init function __vaDriverInit_1_22
libva info: va_openDriver() returns 0
vainfo: Driver version: Intel iHD driver for Intel(R) Gen Graphics - 24.3.4 ()
dlstreamer@snehal-Latitude-3420:~$ cat /models/model_proc/face-reidentification-retail-0095.json
{
  "json_schema_version": "2.2.0",
  "input_preproc": [
    {
      "format": "image",
      "layer_name": "0",
      "params": {
        "alignment_points": [
          0.31556875000000000,
          0.4615741071428571,
          0.68262291666666670,
          0.4615741071428571,
          0.50026249999999990,
          0.6405053571428571,
          0.34947187500000004,
          0.8246919642857142,
          0.65343645833333330,
          0.8246919642857142
        ]
      }
    }
  ],
  "output_postproc": [
    {
      "attribute_name": "face_id",
      "format": "cosine_distance"
    }
  ]
}
dlstreamer@snehal-Latitude-3420:~$ gst-launch-1.0
```

5. GStreamer pipeline command launched using gst-launch-1.0.

Performs :

- File decoding of sample1.mp4
- Face detection using gvadetect
- Face re-identification using gvaclassify
- Visualization via gvawatermark
- GPU-based inference

Purpose: Executes full DL Streamer inference pipeline with detection + classification, rendering in real time.

```
dstreamer@snehal-Latitude-3420: ~  
dstreamer@snehal-Latitude-3420:~$ source /opt/intel/opencvino/setupvars.sh  
benchmark_app -m /models/face-detection-retail-0004.xml -d GPU -niter 1  
bash: /opt/intel/opencvino/setupvars.sh: No such file or directory  
bash: benchmark_app: command not found  
dstreamer@snehal-Latitude-3420:~$ gst-launch-1.0 \  
  filesrc location=/models/sample1.mp4 ! decodebin ! videoconvert ! \  
  gvadetect model=/models/face-detection-retail-0004.xml device=GPU ! \  
  gvaclassify \  
    model=/models/face-reidentification-retail-0095.xml \  
    model-proc=/models/model_proc/face-reidentification-retail-0095.json \  
    device=GPU ! \  
  gvawatermark ! videoconvert ! fpsdisplaysink  
libva info: VA-API version 1.22.0  
libva info: User environment variable requested driver 'iHD'  
libva info: Trying to open /usr/lib/x86_64-linux-gnu/dri/iHD_drv_video.so  
libva info: Found init function __vaDriverInit_1_22  
libva info: va_openDriver() returns 0  
Setting pipeline to PAUSED ...  
Pipeline is PREROLLING ...  
Got context from element 'vapostproc1': gst.va.display.handle=context, gst-display=(GstObject)"(GstVaDisplayDrm)\ vdisplaydrm2", descriptio  
n=(string)"Intel(R)\ Gen\ Graphics", path=(string)/dev/dri/renderD128;  
Redistribute latency...  
Redistribute latency...  
Redistribute latency...  
Pipeline is PREROLLED ...0 %)  
Setting pipeline to PLAYING ...  
Redistribute latency...0.8 %)  
New clock: GstSystemClock  
Redistribute latency...  
WARNING: from element /GstPipeline:pipeline0/GstFPSDisplaySink:fpsdisplaysink0/GstAutoVideoSink:fps-display-video_sink/GstXvImageSink:fps-disp  
lay-video_sink-actual-sink-xvimage: A lot of buffers are being dropped.  
Additional debug info:  
../libs/gst/base/gstbasesink.c(3147): gst_base_sink_is_too_late (): /GstPipeline:pipeline0/GstFPSDisplaySink:fpsdisplaysink0/GstAutoVideoSink:  
fps-display-video_sink/GstXvImageSink:fps-display-video_sink-actual-sink-xvimage:  
There may be a timestamping problem, or this computer is too slow.  
Redistribute latency...22.1 %)  
Got EOS from element "pipeline0".  
Execution ended after 0:00:22.899234198
```