Jetson Nano AI Fundamentals - Hello World AI

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Outline

- Jetson Nano AI Fundamentals
- Camera Streaming
- imagenet
- detectnet

Downloads

- https://github.com/dusty-nv/jetson-inference
- Download the repository
  - git config --global http.postBuffer 524288000
  - git clone --recursive --depth=1 https://github.com/dusty-nv/jetson-inference
- Run the container
  - cd jetson-inference
  - docker/run.sh

Mounted Data Volumes

- jetson-inference/data (stores the network models, serialized TensorRT engines, and test images)
- jetson-inference/python/training/classification/data (stores classification training datasets)
- jetson-inference/python/training/classification/models (stores classification models trained by PyTorch)
- jetson-inference/python/training/detection/ssd/data (stores detection training datasets)
- jetson-inference/python/training/detection/ssd/models (stores detection models trained by PyTorch)

Video Viewer

- On Nano, broadcast output stream over RTP to <remote-ip>
  - video-viewer /dev/video0 rtp://192.168.55.100:1234
  - video-viewer --input-width=640 --input-height=480 /dev/video0 rtp://192.168.55.100:1234
- On host PC, Viewing RTP Remotely

gst-launch-1.0 -v udpsrc port=1234 \

caps = "application/x-rtp, media=(string)video, clock-rate=(int)90000, encoding-name=(string)H264, payload=(int)96" ! \

rtph264depay ! decodebin ! videoconvert ! autovideosink

Image Classification - imagenet

- Make sure Nano is connected to the Internet!
- Run the container
- cd jetson-inference/build/aarch64/bin
- ./imagenet.py images/orange_0.jpg images/test/output_0.jpg
- Use ‘scp’ command to copy it to your PC
    - scp nano@192.168.55.1:jetson-inference/data/images/test/output_0.jpg .

Using the ImageNet Program on Live Video

- imagenet /dev/video0 rtp://192.168.55.100:1234
- On host PC, Viewing RTP Remotely

```
gst-launch-1.0 -v udpsrc port=1234 \

caps = "application/x-rtp, media=(string)video, clock-rate=(int)90000,
encoding-name=(string)H264, payload=(int)96" ! \

rtph264depay ! decodebin ! videoconvert ! autovideosink
```

Object Detection - detectnet

- Make sure Nano is connected to the Internet!
- Run detectnet on Jetson Nano
  - detectnet /dev/video0 rtp://192.168.55.100:1234
- Viewing RTP Remotely on Host PC

```
gst-launch-1.0 -v udpsrc port=1234 \

 caps = "application/x-rtp, media=(string)video, clock-rate=(int)90000, encoding-name=(string)H264, payload=(int)96" ! \

rtph264depay ! decodebin ! videoconvert ! autovideosink
```