CAM2 Streamer Functionality

Amol Moses Jha

June 5, 2018

What Streamer essentially is, as it's name suggests, is an efficient stream processing backend, as it uses Apache Kafka as a stream processing backend and then allows developers to use exisiting robust DNN frameworks like Caffe or TensorFlow to analyze and work with the incoming stream.

Essentially it provides a more efficient way to process streams as compared to the default opencv paradigm of breaking video streams down frames by frames.

It uses the following neural net frameworks:

- MobileNets A neural network framework indevelopement by a research team at Cornell https://arxiv.org/abs/1704.04861
- GoogLeNet A convoluted nueral network used in a lot oif applications for object detection and classification https://www.cs.unc.edu/~wliu/papers/GoogLeNet.pdf

Some of the things streamer can do, according to its C++/Python API (this is not a exhaustive list):

- Object tracking with the following trackers are available:
  - Dlib https://github.com/davisking/dlib
  - Struck http://www.samhare.net/research/struck
- Image Detection using the following detectors:
  - MobileNet SSD Detector (Essentially Tensorflow's backend for Detection) https://github.com/tensorflow/models/tree/master/research/object_detection
  - YOLO Detector https://pjreddie.com/darknet/yolo/
- Face Recognition/Detection using:
  - Tensorflow https://github.com/davidsandberg/facenet
  - MTCNN Face Detection https://github.com/pangyupo/mxnet_mtcnn_face_detection
- Image classification using the above frameworks for neural networks.

- Also has an encoder and a decoder for working with different video formats, so essentially handles transcoding of video in different formats.

As far as training the neural net goes, it does use a database for training, but I think one can override it.