Video and Image Processing Support in WSO2 Platform

Goal

Ability to pre processes images and extract features that can be used for further analysis.

State of the Art

This is primarily a image processing problem as video is handled frame by frame (do they capable of reusing information detected at the earlier Frame?)

OpenCV is the default solution. It is written with C++ but have bindings for Java and Python. There are prebuilt models, but their accuracy might be affected by conditions like lighting and shading. Pre built models are released as cascade files. E.g. following are set of prebuilt models related to humans.
http://alereimondo.no-ip.org/OpenCV/34

Google has released their image recognition models though tensor flow. They have support for retraining the models.
https://www.tensorflow.org/versions/r0.10/tutorials/image_recognition/index.html
https://research.googleblog.com/2016/03/train-your-own-image-classifier-with.html

Integration to WSO2 Platform

1. End user can define video or image stream
2. He can pick a transformation from a repository of transformations (e.g. detect humans)
3. Alternatively he can create, train and upload a new transformation. We do not need tooling for this, and existing python and command line tools are sufficient for this stage.
4. These transformations extract useful features that are in structured form, which can be used for further processing.

5. We need to provide few useful reusable models, and also document how user can create his own models.
6. We can use human activity detection as our primary usecase.

Open Questions

1. What kind of accuracy we can achieve for typical problems such as detecting a human, detecting a vehicle, read the number plate using pretrained models?
2. Where can we find test data?
3. Choice between OpenCV and google inception models? What works better when?
4. Can we retrain the models to add our test data as well? What kind of accuracy improvements can we get?
5. What are the computational requirements? What are the limits with and without GPUs?