Sport Video Analytics and Retrieval

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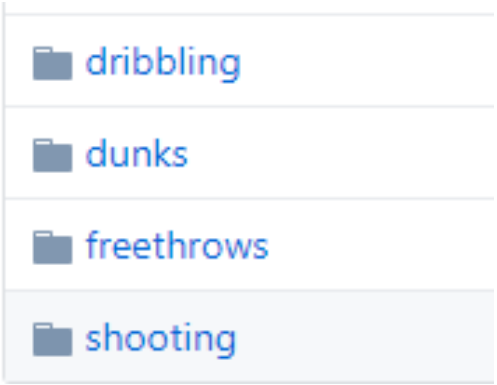
Proposed Work

- Generate Various models for Image Classification using Decision Trees, Random Forests.
- Build a Convolutional Neural Net for Image Classification.
- Using Spark API/Clarifai API to create a simple Android Application for sports information.

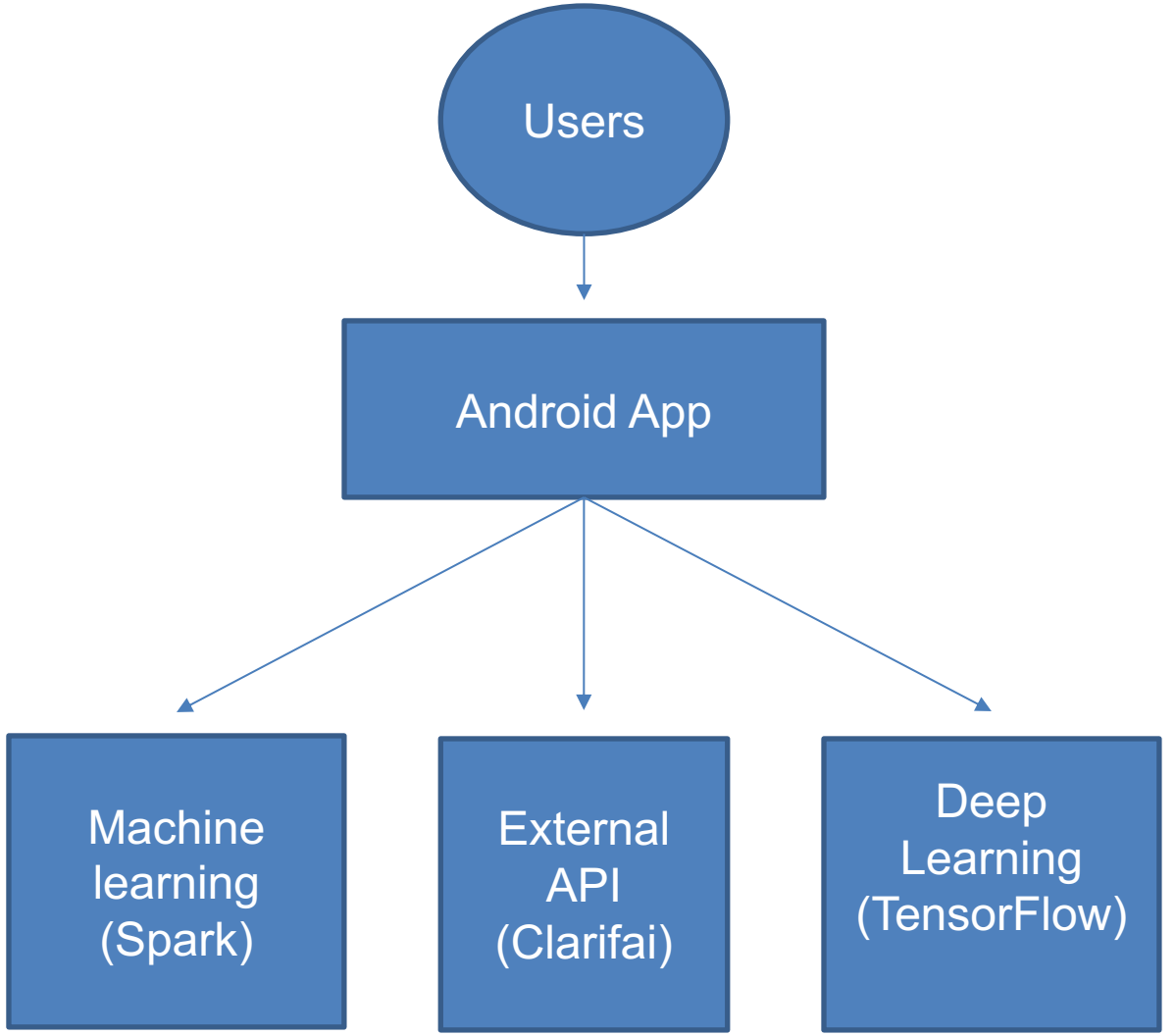
Data Collection

- Generated about 200 frames images divided into 4 categories from different basketball videos. The 4 classes are:



Architecture

- Spark: trained the video and did the objection detection from Keyframes. Image classification task with the algorithms (e.g., Decision Tree, Random Forest, Naïve Bayes).
- Clarifai: Put images to the Clarifai service and returns a prediction.
- Tensorflow: Image Classification Task with CNN, Linear Regression, and SoftMax Regression.



Results

Accuracy Comparison Chart

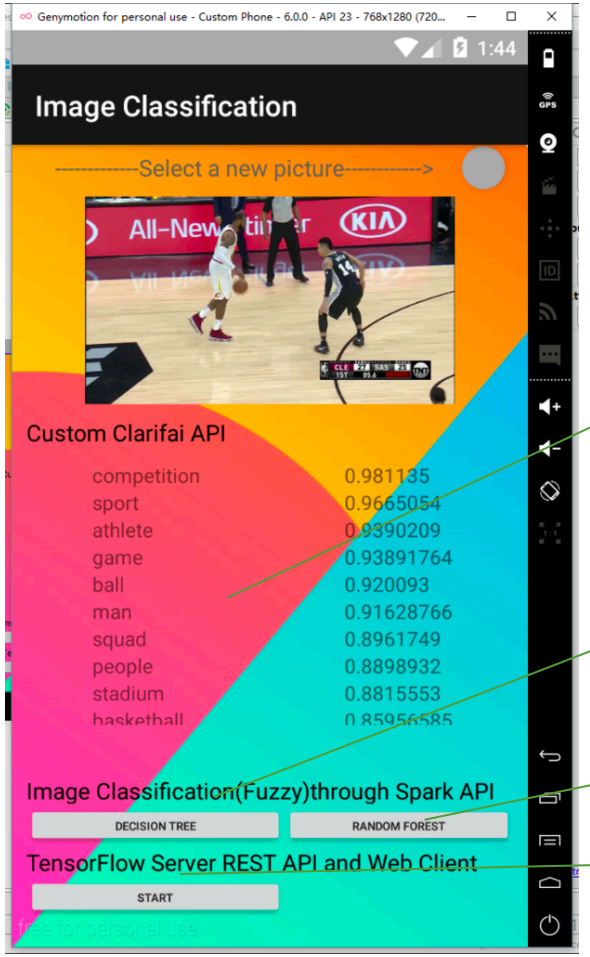
Shallow Learning	
Naïve Bayes	33%
Decision Tree	89%
Random Fores	93%
TensorFlow	
CNN	94%
Linear Regression	67%
SoftMax Regression	89%

Inception : 95.3%

Results (Clarifai)

Categories	Accuracy %
Dribble	96
Dunk	96
Shooting	83
Free Throws	99
Total	94

Android Application



Request(image)

Response(Prediction)

External API (Clarifai)

Model trained using decision tree

Model trained using random tree

Model trained using Inception model

Thanks