Workshop in Machine Learning for Object Recognition using TensorFlow in Mobile Application Android

Dictated by

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What is Android and Android Studio?
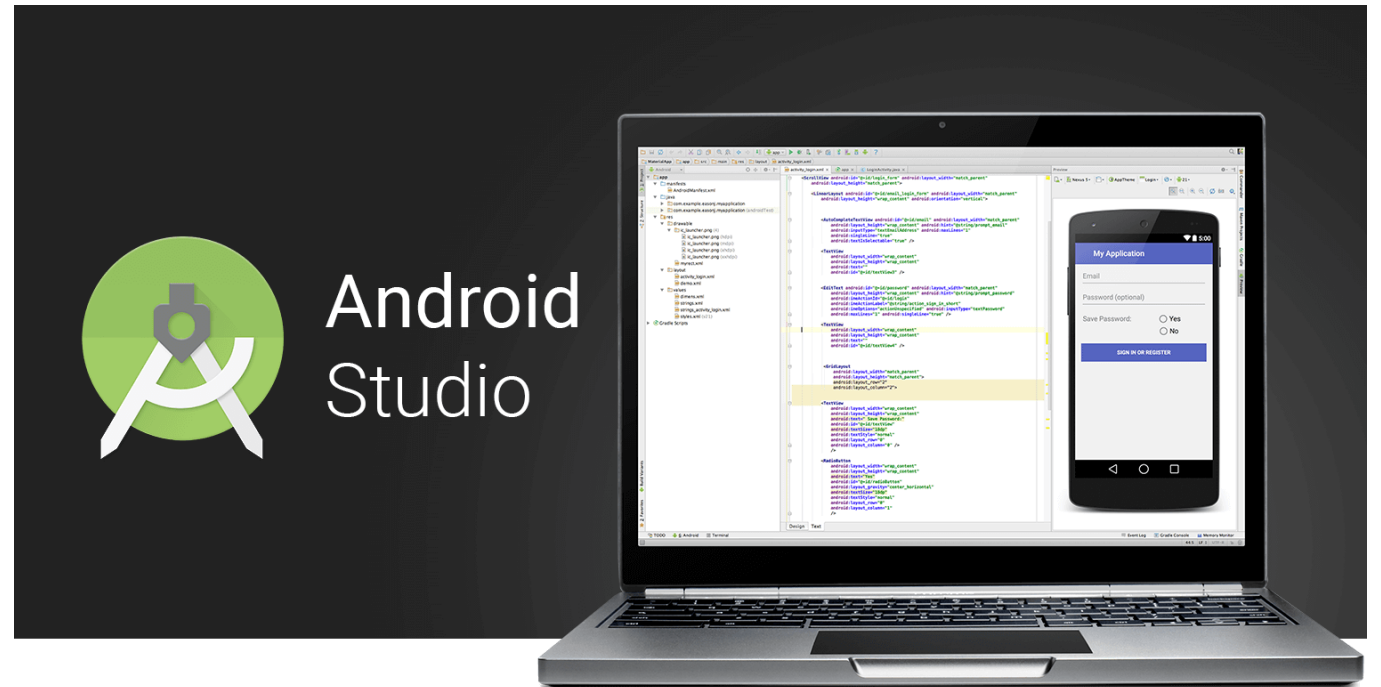

Gif #1: AndroidDev

Image #1: Android Studio
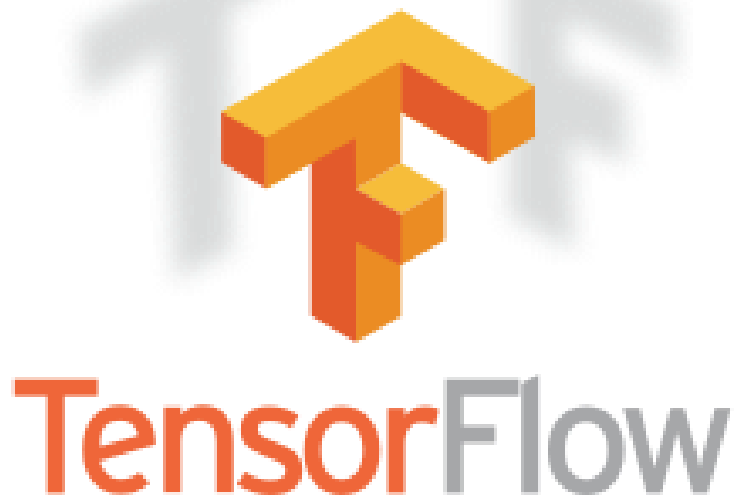
What is TensorFlow and TensorFlow Lite?

Image #2: TensorFlow icon

Image #3: TensorFlow Lite icon

What is Firebase?

Image #4: Firebase icon

Image #5: Map of Firebase Services

Introduction to the Experiment

Step by step

Download and/or update Android Studio → Install TensorFlow and TensorFlow Lite → Download image dataset → Download code to retrain the algorithms → Download code to retrain the algorithms → Convert trained model to TensorFlow Lite → Get trained model → Test the model in Android application or in the console → Upload predictions to Firebase

Install Android Studio

Step 1

- Download Java Developer Kit (JDK):
  https://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html (jdk-8u162-linux-x64.rpm) for Linux x64

- Go to the download path and run this command: *sudo dnf install jdk-8u162-linux-x64.rpm*

- Install Packs : *sudo dnf install zlib.i686 ncurses-libs.i686 bzip2-libs.i686 compat-libstdc++-296 compat-libstdc++-33 glibc libgcc nss-softokn-freebl libstdc++ ncurses-libs zlib-devel.i686 ncurses-devel.i686 ant*

Step 2

- Already downloaded the file. zip Android Studio We will unzip it in the folder "/opt/" with the following command: *sudo unzip ~/Descargas/android-studio-id-version-linux.zip -d /opt/*

- Once the. zip file is unzipped we go to the decompression route in terminal: *cd /opt/android-studio/bin*

- Once located in the route we write in the terminal : *./studio.sh* to start with the installation.

- We edit our environment variable configuration submittal with the following command: *gedit ~/.bash_profile*

- Add below EXPORT the following line: *export PATH=$PATH:$HOME/Android/Sdk/tolos*

- *android update sdk --no-ui --filter build-tools-28.0.2,android-28,extra-android-m2repository*

Gif #2: OK

Install TensorFlow and TensorFlow Lite

Step 1

- We install Flow Tensor with the following command: *pip install –upgrade "tensorflow==1.7.*"*

- Then execute the following command: *pip install PILLOW*

Dataset:

http://vision.stanford.edu/aditya86/ImageNetDogs/

http://web.mit.edu/torralba/www/indoor.html

We started our experiment (1/6)

- **First step:**
- *We proceed to train our model with our dataset:*

*python -m scripts_py.retrain *

  *--bottleneck_dir=results/bottlenecks *

  *--how_many_training_steps=500 *

  *--model_dir=results/models/ *

  *--summaries_dir=results/training_summaries/"mobilenet_0.50_224" *

  *--output_graph=results/model_result.pb *

  *--output_labels=results/labels_results.txt *

  *--architecture="mobilenet_0.50_224" *

  --image_dir=datasets/dogs

We started our experiment (2/6)

- **Second step:**

- *We proceed to test our model with an image::*

*python -m scripts_py.label_image *

  *--graph=results/model_result.pb *

  --image=results/test/image_name.jpg

We started our experiment (3/6)

- **Third step:**

- *Then proceed to convert our model to Tensor Flow Lite with TOCO::*

*toco *

 *--graph_def_file=results/model_result.pb *

 *--output_file=results/model_android.lite *

 *--output_format=TFLITE *

 *--input_shape=1,224,224,3 *

 *--input_array=input *

 *--output_array=final_result *

 *--inference_type=FLOAT *

 --inference_input_type=FLOAT
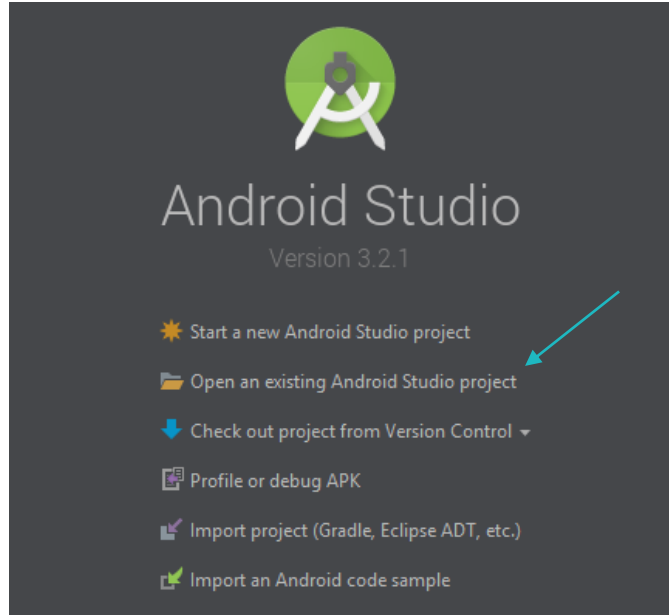
- **Fourth step:**

- *Open Android Project:*

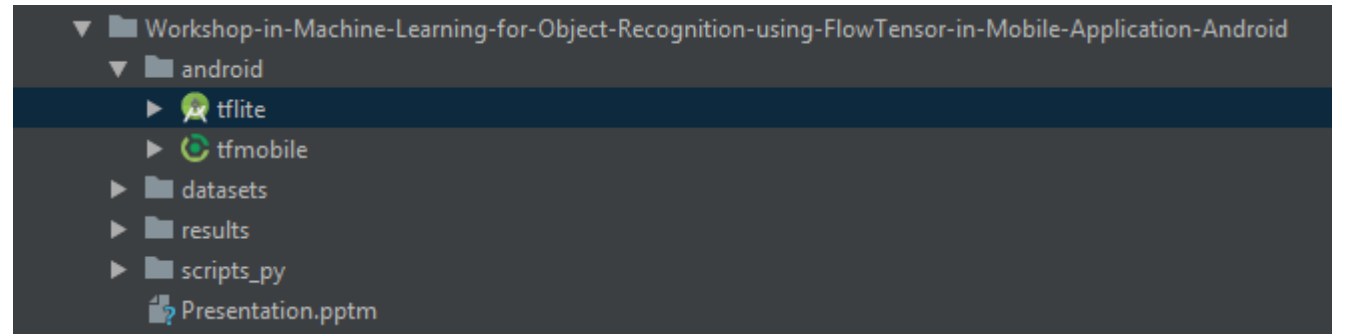Image #6: Android Studio Home Screen

Image #7: Select the project

We started our experiment (5/6)

- **Five step:**

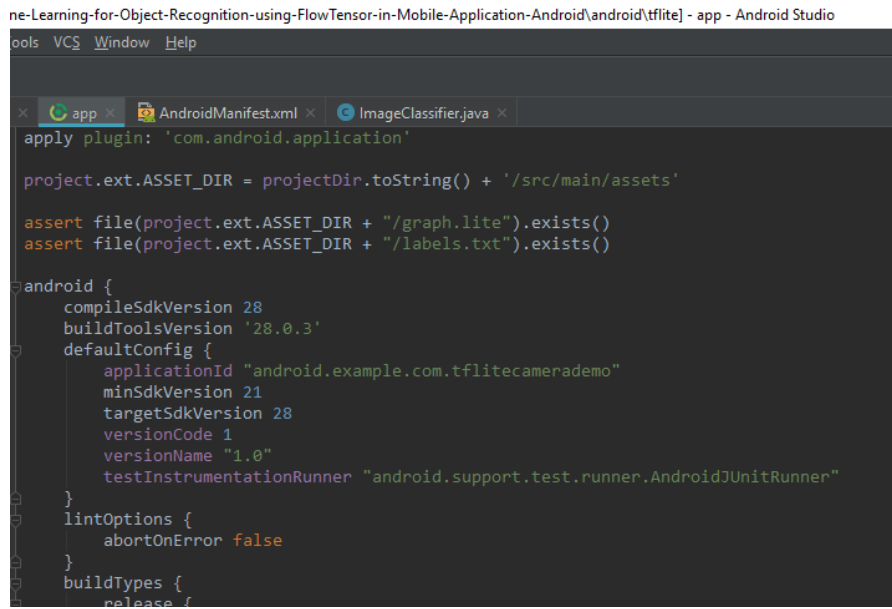- *Configure Android project with our model and our generated tags:*
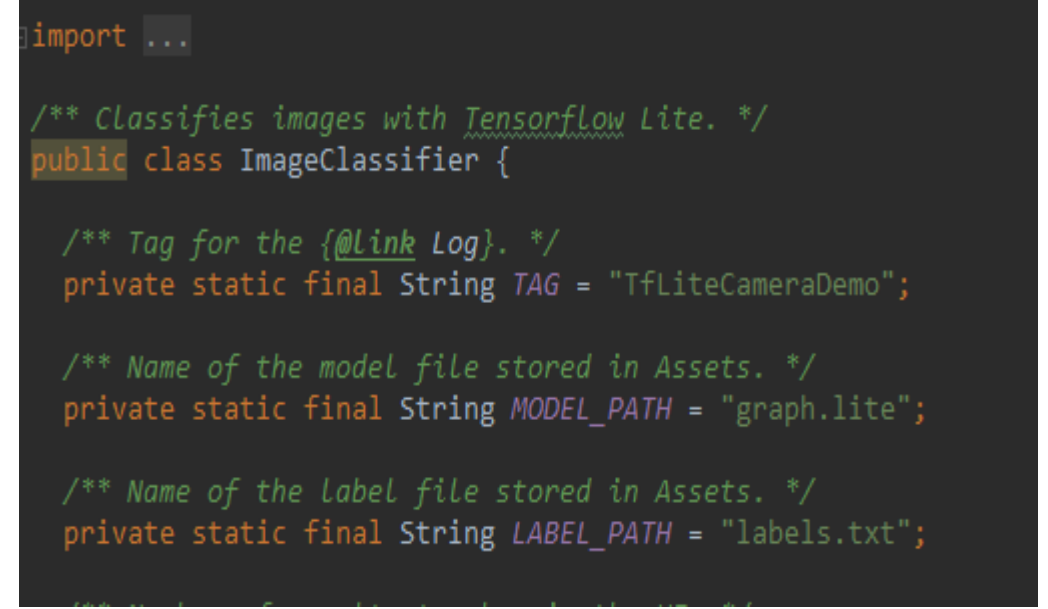

Image #8: Configure Gradle

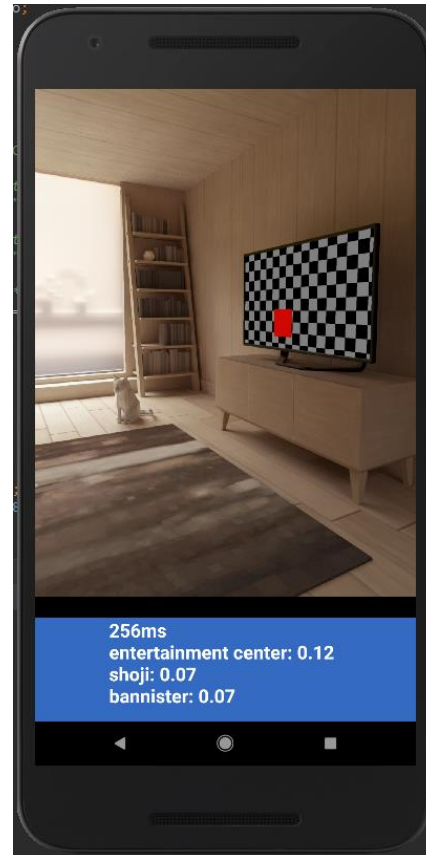Image #9: Change File name

- **Six step:**

- *Run Android Project:*

Image #10: Real-time object recognition

¿Firebase?, ¿Realtime Database?

Gif #3: Goo

References

- *https://www.tensorflow.org/?hl=en*

- *https://codelabs.developers.google.com/*

- *https://developer.android.com/studio/?hl=es-419*

- *https://firebase.google.com/*

- *https://android-developers.googleblog.com/*

Website: *https://domibdo.com/evertdev.html*

GitHub: *https://github.com/evernext10/*

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