

Steps to run the application.

1. Connect phone to computer.
2. Enable USB debugging, port forwarding on phone, open <http://127.0.0.1:5000/> on web browser.
3. Import OpenCV (cv2), pandas, tsfel for python.
import cv2
import cvlib as cv
import pickle
import tsfel
https://github.com/fraunhoferportugal/tsfel/blob/master/notebooks/TSFEL_HAR_Example.ipynb
3. Start the server API on the python side.
4. Install the android application.
5. Take a picture while speaking and pointing at an object.
6. The picture will be recorded and sent to the server API for processing.
7. Afterwards, a bounding box will be returned around the object you were pointing at.
(You do not need to continue pointing at the object)
8. Press the up/down buttons to render an image (Up will be Nodding gesture - Renders a cube)
(Down will be Shaking gesture - Renders a sphere).
9. Press the X button to clear the UI to test with a new object.

Note:

1. If there is a connection error displayed, it means the server API is reloading, keep trying until it works. It is either Null image or API reload.

```
Restarting code...
* Detected change in 'C:\\Users\\User\\anaconda3\\Lib\\site-packages\\flask\\_pycache_\\debughelpers.cpython-38.pyc', reloading
INFO:werkzeug: * Detected change in 'C:\\Users\\User\\anaconda3\\Lib\\site-packages\\flask\\_pycache_\\debughelpers.cpython-38.pyc', reloading
* Restarting with windowsapi reloader
2021-04-30 11:51:10.126975: W tensorflow/stream_executor/platform/default/dso_loader.cc:60] Could not load dynamic library 'cudart64_110.dll'; dlopen: cudart64_110.dll not found
2021-04-30 11:51:10.127283: I tensorflow/stream_executor/cuda/cudart_stub.cc:29] Ignore above cudart dlerror if you do not have a GPU set up on your machine.
* Debugger is active!
* Debugger PIN: 103-456-164
* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
```

2. The data used to test the gesture classifier **MUST** be in this format due to data preprocessing removing the first and last column from the data. It will remove important information otherwise. The timestamp and gesture column are removed.

	A	B	C	D	E	F	G	H	I
1	Timestamp	A_X	A_Y	A_Z	G_X	G_Y	G_Z	Gesture	
2	47920	-1.00903	-0.04138	0.037842	-16.7683	-8.14024	-11.0976	Shaking	
3	47960	-1.00659	-0.01733	0.034546	-16.128	2.865854	-10.3963	Shaking	
4	48000	-1.01245	-0.02332	-0.00037	-5.97561	-1.61585	-4.7561	Shaking	
5	48040	-0.98779	-0.0238	-0.00208	-11.6463	-2.59146	-5.39634	Shaking	
6	48080	-0.98511	-0.0293	0.032104	-10.6707	3.75	-5.21341	Shaking	
7	48120	-1.01257	-0.02759	0.034424	-8.71951	2.22561	-5.45732	Shaking	
8	48160	-1.0105	-0.02515	0.034302	-7.92683	2.804878	-11.2805	Shaking	
9	48200	-0.98853	0.032959	0.003662	-11.4024	3.323171	0.884146	Shaking	
10	48240	-1.11926	0.191284	-0.04333	-80	-19.5427	-10.8537	Shaking	