Dances With Drones

Using Google's TFLite for Autonomous Control of Aerial Drones by Gesture Recognition

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Parrot Bebop 2

Data Assimilation

Fly upward 1m at 1m/s
Mobile Phone
Image is classified...
Parrot Drone
Translate to hardware
Actuators
Do the thing
Rotate all propellers at x rpm

12:20
SDKSample
Battery: 60%
EMERGENCY
TAKE PICTURE
FORWARD
UP
LEFT
roll
RIGHT
LEFT
yaw
RIGHT
BACK
DOWN
100ms
up: 0.65
negative: 0.34
TAKE OFF
Recorded by Mobizen

Failed test.

12:23
SDKSample
Battery: 59%
EMERGENCY
TAKE PICTURE
FORWARD
UP
LEFT
roll
RIGHT
LEFT
yaw
RIGHT
BACK
DOWN
248ms
rotate: 0.80
up: 0.10
TAKE OFF
Recorded by Mobizen

Passed test!

饮用天然泉水

New classifier!
5 Nice Classes
A
B
C
D
E
≈ Gibberish
Pixels
Pixels

X
Y

V.

100%

50%

At 50%

Person = Up

At 100%

74% confidence

80% conf.

84% conf.

References

- MobileNet tutorial: https://codelabs.developers.google.com/codelabs/tensorflow-for-poets/index.html?index=..%2F..%2Findex#0
- TFLite tutorial: https://codelabs.developers.google.com/codelabs/tensorflow-for-poets-2-tflite/index.html?index=..%2F..%2Findex#0
- MobileNet paper: https://arxiv.org/pdf/1704.04861.pdf

Others' Gesture Controlled Drones

- https://arxiv.org/pdf/1803.10344.pdf
- https://www.researchgate.net/profile/Tatsuo_Nakajima/publication/261960777_KinecDrone_enhancing_somatic_sensation_to_fly_in_the_sky_with_Kinect_and_ARDrone/links/56b491df08ae922e6c01f7b3/KinecDrone-enhancing-somatic-sensation-to-fly-in-the-sky-with-Kinect-and-ARDrone.pdf
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