In [0]:
```
from google.colab import drive
drive.mount('/content/drive')
```

```
Go to this URL in a browser: https://accounts.google.com/o/oauth2/auth?
client_id=947318989803-6bn6qk8qdgf4n4g3pfee6491hc0brc4i.apps.googleuser
content.com&redirect_uri=urn%3aietf%3awg%3aoauth%3a2.0%3aoob&response_t
ype=code&scope=email%20https%3a%2f%2fwww.googleapis.com%2fauth%2fdocs.t
est%20https%3a%2f%2fwww.googleapis.com%2fauth%2fdrive%20https%3a%2f%2fw
ww.googleapis.com%2fauth%2fdrive.photos.readonly%20https%3a%2f%2fwww.go
ogleapis.com%2fauth%2fpeopleapi.readonly

Enter your authorization code:
..........
Mounted at /content/drive
```

In [0]:
```
! curl --header "Host: doc-08-58-docs.googleusercontent.com" --header
"User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.
36 (KHTML, like Gecko) Chrome/81.0.4044.138 Safari/537.36" --header "Ac
cept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,
image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.9" --header
"Accept-Language: en-US,en;q=0.9,te-IN;q=0.8,te;q=0.7" --header "Refere
r: https://drive.google.com/u/0/uc?id=1QiEgrF7OMNgAkoO4f7pm6vWpVb7Em2cW
&export=download" --header "Cookie: AUTH_eej2mpo5b56rjaenh8auc8aadufmqg
e4_nonce=83pn5adp3ureu" --header "Connection: keep-alive" "https://doc-
08-58-docs.googleusercontent.com/docs/securesc/ek874aur9s8o9qgavpq17lh5
jvudvqof/srd2sj0lc06davi3pc4qp89as23rj9ke/1590493875000/066291476359636
09455/07710941660107426028/1QiEgrF7OMNgAkoO4f7pm6vWpVb7Em2cW?e=download
&authuser=0&nonce=83pn5adp3ureu&user=07710941660107426028&hash=ok6est3s
8f61ghioebdjsq28nael7mag" -L -o 'Autopilot-TensorFlow-master.rar'
```

```
  % Total    % Received % Xferd  Average Speed   Time    Time     Time
Current
                                 Dload  Upload   Total   Spent    Left
Speed
100 2270M    0 2270M    0     0  77.6M      0 --:--:--  0:00:29 --:--:-
- 59.1M
```

In [0]:
```
!pip install patool
import patoolib
patoolib.extract_archive("Autopilot-TensorFlow-master.rar", outdir="/co
ntent/")
```

```
Collecting patool
  Downloading https://files.pythonhosted.org/packages/43/94/52243ddff50
8780dd2d8110964320ab4851134a55ab102285b46e740f76a/patool-1.12-py2.py3-n
one-any.whl (77kB)
     |████████████████████████████████| 81kB 3.9MB/s
Installing collected packages: patool
Successfully installed patool-1.12
patool: Extracting Autopilot-TensorFlow-master.rar ...
patool: running /usr/bin/unrar x -- /content/Autopilot-TensorFlow-maste
r.rar
patool:     with cwd='/content/'
patool: ... Autopilot-TensorFlow-master.rar extracted to `/content/'.
```

Out[0]:
```
'/content/'
```

In [0]:
```
import warnings
warnings.filterwarnings("ignore", category=DeprecationWarning)
import os
import datetime as dt
import random
import cv2
import math
import numpy as np
from scipy import pi
import scipy
import scipy.misc
import pandas as pd
from subprocess import call
from datetime import datetime
from itertools import islice
import matplotlib.pyplot as plt
import tensorflow as tf
from tensorflow import keras
from tensorflow.keras import Sequential
```

```
from tensorflow.keras.layers import Flatten, Dense, Dropout, BatchNorma
lization,Lambda,Input

from tensorflow.keras.layers import Conv2D,MaxPooling2D
from keras import regularizers, optimizers
from skimage.io import imread, imshow
from skimage.transform import resize
import pickle

from itertools import islice
from tqdm import tqdm
import time
import cv2
from skimage import io
from keras.preprocessing.image import array_to_img, img_to_array, load_
img
from keras.preprocessing import image
import h5py
from glob import glob
from sklearn.model_selection import train_test_split
import IPython.display as display
from PIL import Image
from keras_preprocessing.image import ImageDataGenerator
```

```
Using TensorFlow backend.
```

Loading Dataset

In [0]:
```
df = pd.read_csv('/content/drive/My Drive/Autopilot-TensorFlow-master/d
ata.txt',sep= ' ', names =['paths', 'angles'])
df['angles'] = df['angles'].apply(lambda x: x*0.0174533 )
```

In [0]:
```
#time based split
split_ratio=0.7
split_up_to=int(len(df)*split_ratio)
train_data = df[:split_up_to]
test_data = df[split_up_to:]
print(split_up_to)
```

```
31784
```

In [0]:
```
train_data.head()
```

Out[0]:

	paths	angles
0	0.jpg	0.0
1	1.jpg	0.0
2	2.jpg	0.0
3	3.jpg	0.0
4	4.jpg	0.0

In [0]:
```
datagen=ImageDataGenerator(rescale=1/255)
train_generator= datagen.flow_from_dataframe(dataframe=train_data, dire
ctory='/content/Autopilot-TensorFlow-master/Autopilot-TensorFlow-maste
r/driving_dataset', x_col="paths", y_col="angles", shuffle=True,batch_s
ize=128, class_mode="raw", target_size=(66,200))
test_generator=  datagen.flow_from_dataframe(dataframe=test_data,  dire
ctory='/content/Autopilot-TensorFlow-master/Autopilot-TensorFlow-maste
r/driving_dataset', x_col="paths", y_col="angles", shuffle=True,batch_s
ize=128, class_mode="raw", target_size=(66,200))
```

```
Found 31784 validated image filenames.
Found 13622 validated image filenames.
```

In [0]:
```
images, labels = next(test_generator)
print(images.dtype, images.shape)
print(labels.dtype, labels.shape)
```

```
float32 (128, 66, 200, 3)
float64 (128,)
```

In [0]:
```
images[0].shape
```

Out[0]:
```
(66, 200, 3)
```

In [0]:
```
# Start of MODEL Definition

intz = tf.keras.initializers.TruncatedNormal(mean=0.0, stddev=0.05, see
d=None)
bias = tf.keras.initializers.Constant(value=0.1)
# where model is start

model = Sequential()

# 5x5 Convolutional layers with stride of 2x2

model.add(Conv2D(24, (5, 5), strides=(2, 2), input_shape=(66, 200, 3),
activation='relu', padding='valid', kernel_initializer= intz ,bias_init
ializer=bias))

model.add(Conv2D(36, (5, 5), strides=(2, 2), activation='relu', padding
='valid', kernel_initializer= intz ,bias_initializer=bias))

model.add(Conv2D(48, (5, 5), strides=(2, 2), activation='relu', padding
='valid', kernel_initializer= intz ,bias_initializer=bias))

# 3x3 Convolutional layers with stride of 1x1

model.add(Conv2D(64, (3, 3), strides=(1, 1), activation='relu', padding
='valid', kernel_initializer= intz ,bias_initializer=bias))

model.add(Conv2D(64, (3, 3), strides=(1, 1), activation='relu', padding
='valid', kernel_initializer= intz ,bias_initializer=bias))

# Flatten before passing to the fully connected layers

model.add(Flatten())

# 100 neurons
model.add(Dense(100, activation = 'relu', kernel_initializer= intz ,bia
s_initializer=bias))

model.add(Dropout(0.5))
```

```
# 50 neurons
model.add(Dense(50, activation = 'relu', kernel_initializer= intz ,bias
_initializer=bias))

model.add(Dropout(0.5))

# 10 neurons
model.add(Dense(10, activation = 'relu', kernel_initializer= intz ,bias
_initializer=bias))

model.add(Dropout(0.5))

# Output layer with linear activation

model.add(Dense(1, activation='linear', name='output',kernel_initialize
r= intz ,bias_initializer=bias))

model.compile(optimizer= keras.optimizers.Adam(lr=1e-3),loss="mean_squa
red_error")

model.summary()
```

```
Model: "sequential"
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
conv2d (Conv2D)              (None, 31, 98, 24)        1824
_________________________________________________________________
conv2d_1 (Conv2D)            (None, 14, 47, 36)        21636
_________________________________________________________________
conv2d_2 (Conv2D)            (None, 5, 22, 48)         43248
_________________________________________________________________
conv2d_3 (Conv2D)            (None, 3, 20, 64)         27712
_________________________________________________________________
conv2d_4 (Conv2D)            (None, 1, 18, 64)         36928
_________________________________________________________________
flatten (Flatten)            (None, 1152)              0
_________________________________________________________________
dense (Dense)                (None, 100)               115300
_________________________________________________________________
```

```
dropout (Dropout)            (None, 100)               0
_________________________________________________________________
dense_1 (Dense)              (None, 50)                5050

_________________________________________________________________
dropout_1 (Dropout)          (None, 50)                0
_________________________________________________________________
dense_2 (Dense)              (None, 10)                510
_________________________________________________________________
dropout_2 (Dropout)          (None, 10)                0
_________________________________________________________________
output (Dense)               (None, 1)                 11
=================================================================
Total params: 252,219
Trainable params: 252,219
Non-trainable params: 0
_________________________________________________________________
```

In [0]:
```
checkpoint= tf.keras.callbacks.ModelCheckpoint('/content/drive/My Driv
e/Autopilot-TensorFlow-master/model_weights.h5', monitor='val_loss', ve
rbose=1, save_best_only=False,ave_weights_only=False, mode='auto', save
_freq='epoch')
callbacks_list = [checkpoint]
history= model.fit(train_generator, epochs=30, steps_per_epoch= 248 ,va
lidation_data=test_generator,workers=-1,verbose=1,validation_steps=106,
callbacks=callbacks_list)
```

```
Epoch 1/30
248/248 [==============================] - ETA: 0s - loss: 0.3136
Epoch 00001: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 132s 534ms/step - loss: 0.31
36 - val_loss: 0.2408
Epoch 2/30
248/248 [==============================] - ETA: 0s - loss: 0.3048
Epoch 00002: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 135s 543ms/step - loss: 0.30
48 - val_loss: 0.2108
Epoch 3/30
```

```
248/248 [==============================] - ETA: 0s - loss: 0.2687

Epoch 00003: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 136s 550ms/step - loss: 0.26
87 - val_loss: 0.2010
Epoch 4/30
248/248 [==============================] - ETA: 0s - loss: 0.2707
Epoch 00004: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 136s 550ms/step - loss: 0.27
07 - val_loss: 0.2052
Epoch 5/30
248/248 [==============================] - ETA: 0s - loss: 0.2311
Epoch 00005: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 136s 550ms/step - loss: 0.23
11 - val_loss: 0.2454
Epoch 6/30
248/248 [==============================] - ETA: 0s - loss: 0.1985
Epoch 00006: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 136s 547ms/step - loss: 0.19
85 - val_loss: 0.2436
Epoch 7/30
248/248 [==============================] - ETA: 0s - loss: 0.1816
Epoch 00007: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 136s 550ms/step - loss: 0.18
16 - val_loss: 0.2578
Epoch 8/30
248/248 [==============================] - ETA: 0s - loss: 0.1709
Epoch 00008: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 137s 551ms/step - loss: 0.17
09 - val_loss: 0.2214
Epoch 9/30
248/248 [==============================] - ETA: 0s - loss: 0.1580
Epoch 00009: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
```

```
248/248 [==============================] - 136s 550ms/step - loss: 0.15

80 - val_loss: 0.2155
Epoch 10/30
248/248 [==============================] - ETA: 0s - loss: 0.1657
Epoch 00010: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 137s 551ms/step - loss: 0.16
57 - val_loss: 0.2537
Epoch 11/30
248/248 [==============================] - ETA: 0s - loss: 0.2365
Epoch 00011: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 135s 545ms/step - loss: 0.23
65 - val_loss: 0.2009
Epoch 12/30
248/248 [==============================] - ETA: 0s - loss: 0.1646
Epoch 00012: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 134s 539ms/step - loss: 0.16
46 - val_loss: 0.2023
Epoch 13/30
248/248 [==============================] - ETA: 0s - loss: 0.1574
Epoch 00013: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 136s 549ms/step - loss: 0.15
74 - val_loss: 0.1869
Epoch 14/30
248/248 [==============================] - ETA: 0s - loss: 0.1418
Epoch 00014: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 136s 549ms/step - loss: 0.14
18 - val_loss: 0.2674
Epoch 15/30
248/248 [==============================] - ETA: 0s - loss: 0.1466
Epoch 00015: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 136s 549ms/step - loss: 0.14
66 - val_loss: 0.2328
Epoch 16/30
```

```
248/248 [==============================] - ETA: 0s - loss: 0.1432

Epoch 00016: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 136s 548ms/step - loss: 0.14
32 - val_loss: 0.2487
Epoch 17/30
248/248 [==============================] - ETA: 0s - loss: 0.1308
Epoch 00017: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 135s 545ms/step - loss: 0.13
08 - val_loss: 0.2438
Epoch 18/30
248/248 [==============================] - ETA: 0s - loss: 0.1313
Epoch 00018: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 136s 549ms/step - loss: 0.13
13 - val_loss: 0.2514
Epoch 19/30
248/248 [==============================] - ETA: 0s - loss: 0.1312
Epoch 00019: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 136s 549ms/step - loss: 0.13
12 - val_loss: 0.2460
Epoch 20/30
248/248 [==============================] - ETA: 0s - loss: 0.1206
Epoch 00020: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 137s 552ms/step - loss: 0.12
06 - val_loss: 0.2467
Epoch 21/30
248/248 [==============================] - ETA: 0s - loss: 0.1357
Epoch 00021: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 136s 547ms/step - loss: 0.13
57 - val_loss: 0.2177
Epoch 22/30
248/248 [==============================] - ETA: 0s - loss: 0.1291
Epoch 00022: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
```

```
248/248 [==============================] - 136s 548ms/step - loss: 0.12

91 - val_loss: 0.2213
Epoch 23/30
248/248 [==============================] - ETA: 0s - loss: 0.1330
Epoch 00023: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 135s 544ms/step - loss: 0.13
30 - val_loss: 0.1934
Epoch 24/30
248/248 [==============================] - ETA: 0s - loss: 0.1233
Epoch 00024: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 136s 548ms/step - loss: 0.12
33 - val_loss: 0.2336
Epoch 25/30
248/248 [==============================] - ETA: 0s - loss: 0.1192
Epoch 00025: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 136s 547ms/step - loss: 0.11
92 - val_loss: 0.2022
Epoch 26/30
248/248 [==============================] - ETA: 0s - loss: 0.1169
Epoch 00026: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 135s 545ms/step - loss: 0.11
69 - val_loss: 0.2034
Epoch 27/30
248/248 [==============================] - ETA: 0s - loss: 0.1119
Epoch 00027: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 135s 544ms/step - loss: 0.11
19 - val_loss: 0.2382
Epoch 28/30
248/248 [==============================] - ETA: 0s - loss: 0.1164
Epoch 00028: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 135s 544ms/step - loss: 0.11
64 - val_loss: 0.2418
Epoch 29/30
```

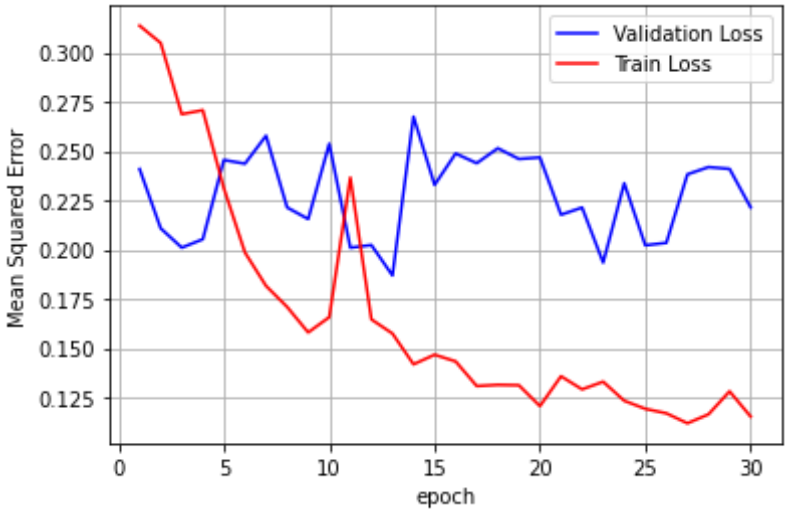
```
248/248 [==============================] - ETA: 0s - loss: 0.1281

Epoch 00029: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 137s 552ms/step - loss: 0.12
81 - val_loss: 0.2409
Epoch 30/30
248/248 [==============================] - ETA: 0s - loss: 0.1153
Epoch 00030: saving model to /content/drive/My Drive/Autopilot-TensorFl
ow-master/model_weights.h5
248/248 [==============================] - 137s 551ms/step - loss: 0.11
53 - val_loss: 0.2214
```

In [0]:
```
final_loss = model.evaluate(test_generator, steps =106)
print("Final loss: {:.2f}".format(final_loss))
```

```
106/106 [==============================] - 37s 347ms/step - loss: 0.221
3
Final loss: 0.22
```

In [0]:
```
def plt_dynamic(x, vy, ty, ax, colors=['b']):
    ax.plot(x, vy, 'b', label="Validation Loss")
    ax.plot(x, ty, 'r', label="Train Loss")
    plt.legend()
    plt.grid()
    plt.show()
    fig.canvas.draw()
fig,ax = plt.subplots(1,1)
ax.set_xlabel('epoch') ;
ax.set_ylabel('Mean Squared Error')
x = list(range(1,30+1))

vy = history.history['val_loss']
ty = history.history['loss']
plt_dynamic(x, vy, ty, ax)
```

Out[0]:



In [0]:
```
# Loads the weights
model.load_weights('/content/drive/My Drive/Autopilot-TensorFlow-master/model_weights.h5')
```

In [0]:
```
image= io.imread('/content/Autopilot-TensorFlow-master/Autopilot-TensorFlow-master/driving_dataset/'+ str(100) + '.jpg')
image_resize =resize(image, (66, 200))
```

In [0]:
```
model.predict(image_resize[None,...])[0][0]*180.0 / scipy.pi
```

Out[0]:
```
1.0254589887763268
```

In [0]:
```

```

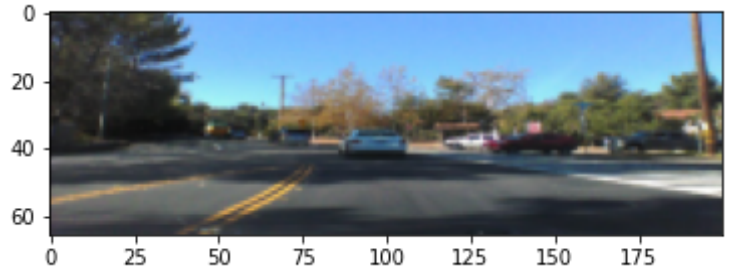
In [0]:
```
rows
```

Out[0]:
```
240
```

In [0]:
```
import scipy.misc
from skimage.transform import resize
import cv2
```

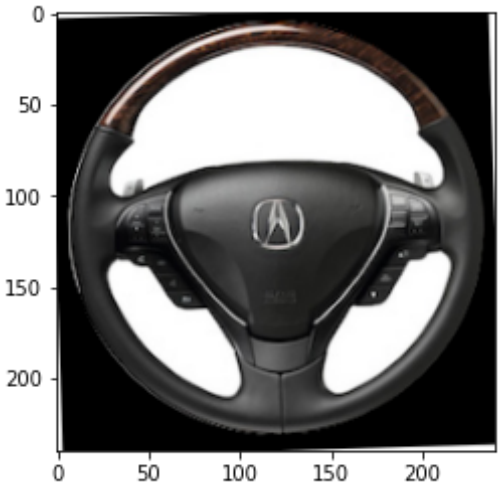
```
from google.colab.patches import cv2_imshow
import imageio
img = io.imread('/content/Autopilot-TensorFlow-master/Autopilot-TensorFlow-master/steering_wheel_image.jpg')
rows,cols = img.shape[0],img.shape[1]
smoothed_angle = 0
for i in range(31784,df.shape[0],1):
  image= io.imread('/content/Autopilot-TensorFlow-master/Autopilot-TensorFlow-master/driving_dataset/'+ str(i) + '.jpg')
  image_resize =resize(image, (66, 200))
  degrees= model.predict(image_resize[None,...])[0][0] * 180.0 / scipy.pi

  plt.imshow(image_resize)
  plt.show()

  print("Predicted steering angle: " + str(degrees) + "degrees")

  smoothed_angle += 0.2 * pow(abs((degrees - smoothed_angle)), 2.0 / 3.0) * (degrees - smoothed_angle) / abs(degrees - smoothed_angle)
  M = cv2.getRotationMatrix2D((cols/2,rows/2),-smoothed_angle,1)
  dst = cv2.warpAffine(img,M,(cols,rows))

  plt.imshow(dst)
  plt.show()

cv2.destroyAllWindows()
```

Out[0]:

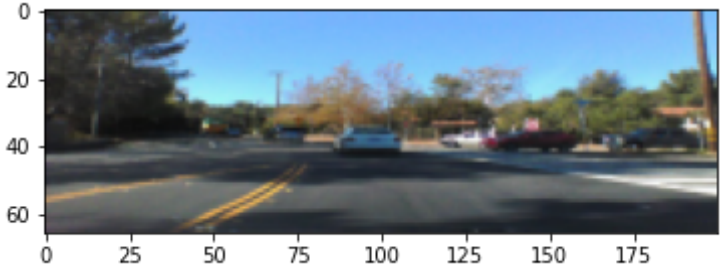



```
Predicted steering angle: -22.949876158444308degrees
```

Out[0]:

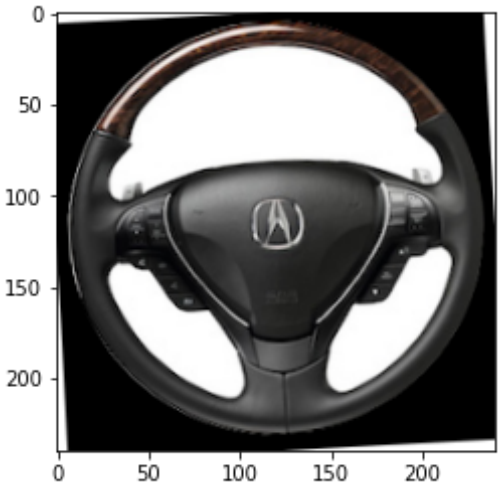


Out[0]:

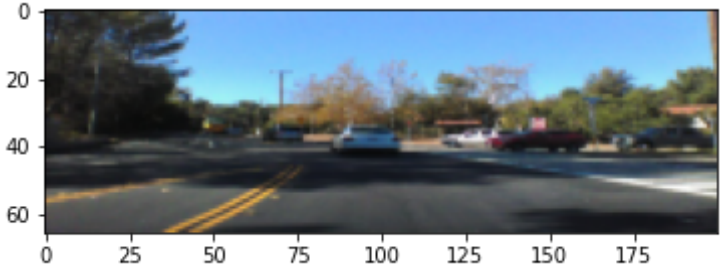



```
Predicted steering angle: -20.196691790809286degrees
```

Out[0]:



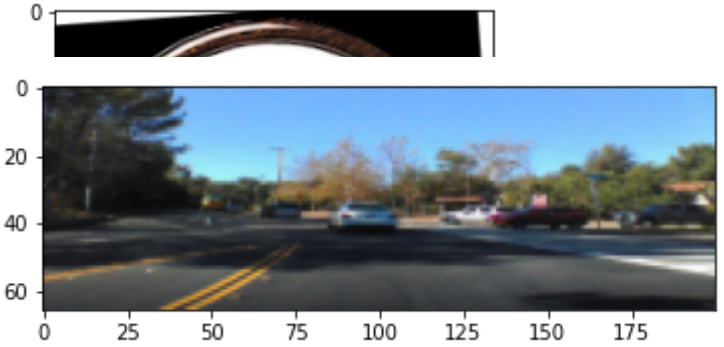
Out[0]:




```
Predicted steering angle: -16.02199820782745degrees
```

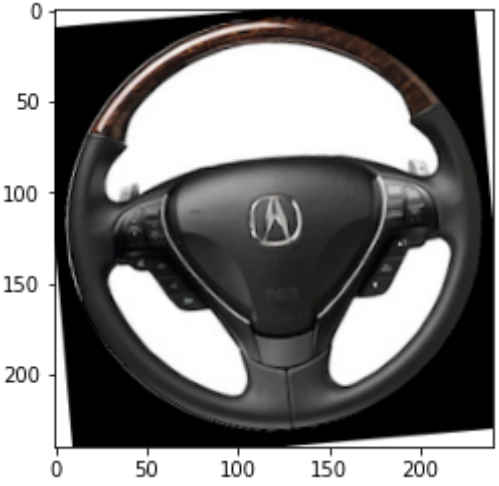
Out[0]:

Out[0]:

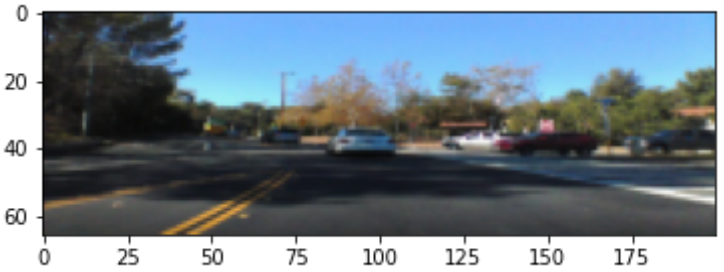



```
Predicted steering angle: -12.987412607708839degrees
```

Out[0]:

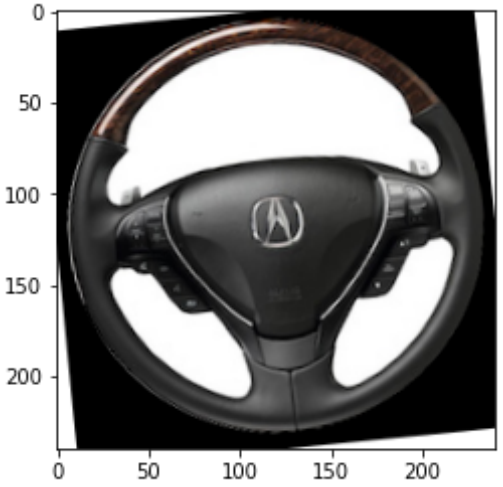


Out[0]:

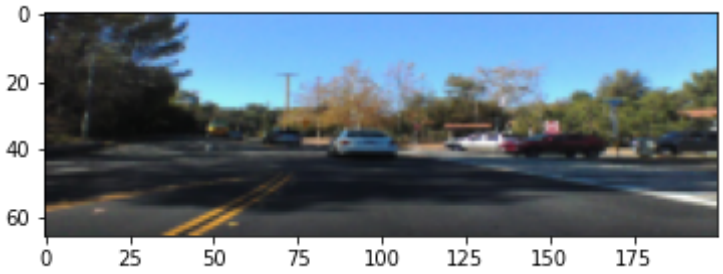



```
Predicted steering angle: -10.856125501739939degrees
```

Out[0]:

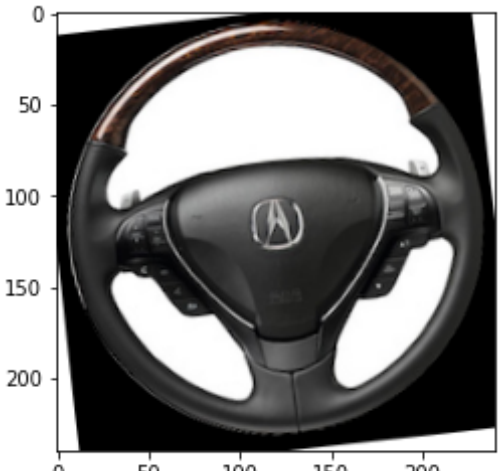


Out[0]:

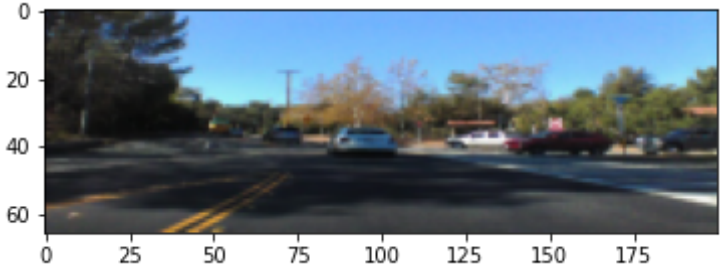



```
Predicted steering angle: -11.715926789934068degrees
```

Out[0]:



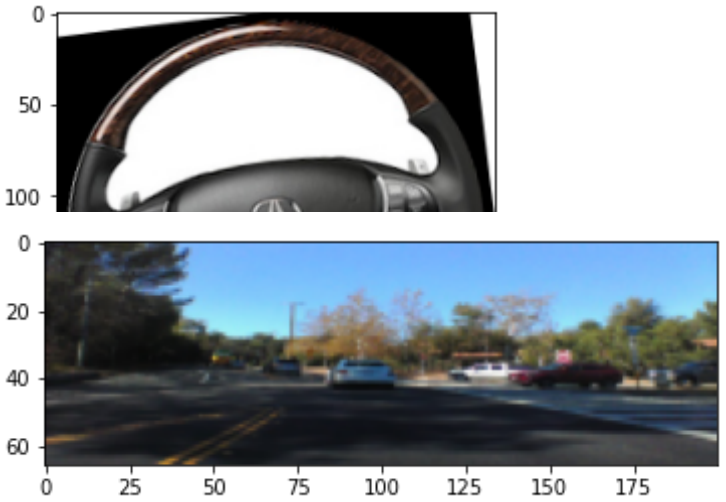
Out[0]:




```
Predicted steering angle: -10.841975057326964degrees
```

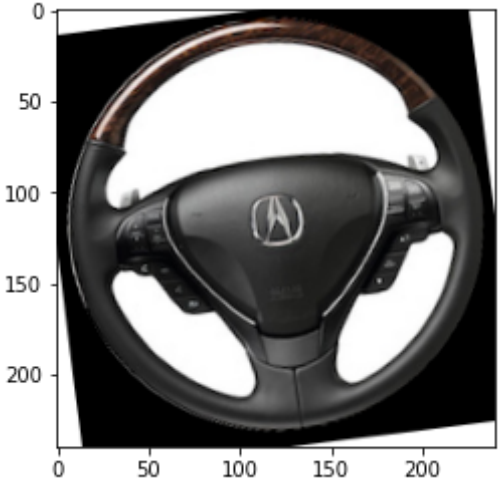
Out[0]:

Out[0]:




```
Predicted steering angle: -8.803809042954724degrees
```

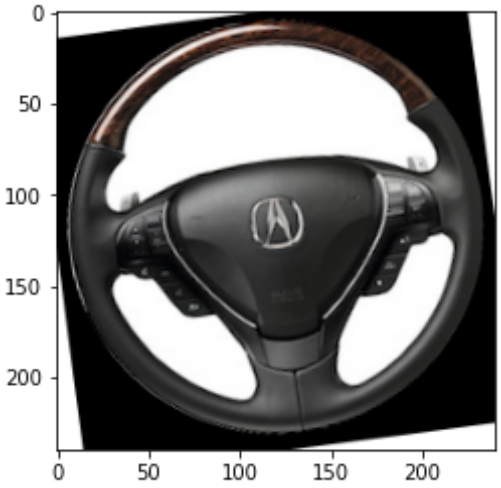
Out[0]:



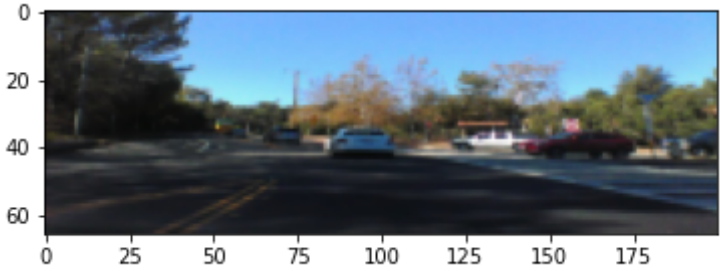
Out[0]:


```
Predicted steering angle: -9.058696334853968degrees
```

Out[0]:



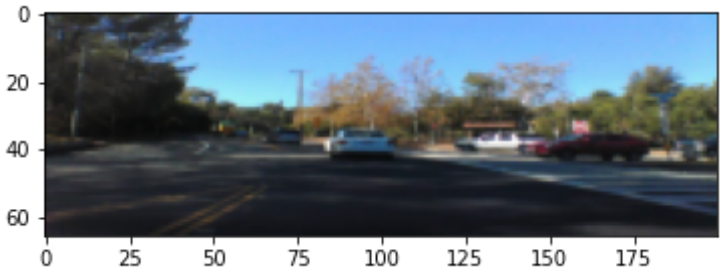
Out[0]:




```
Predicted steering angle: -10.914747307838866degrees
```

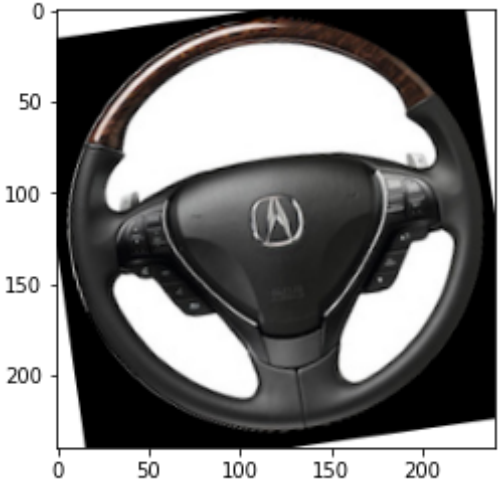
Out[0]:

Out[0]:

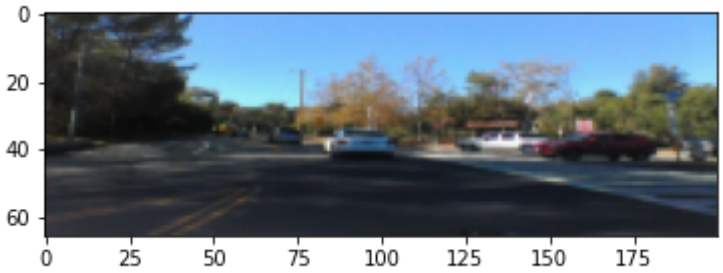



```
Predicted steering angle: -8.773255899249964degrees
```

Out[0]:

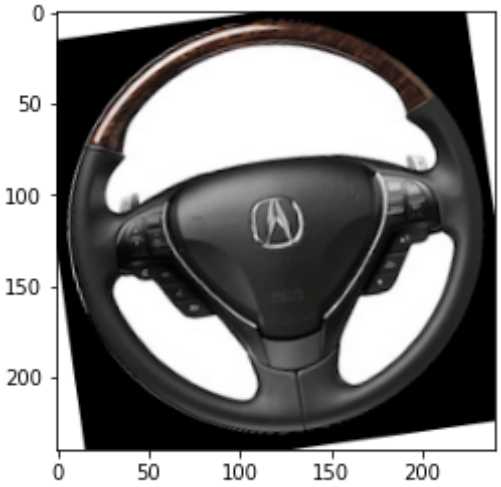


Out[0]:

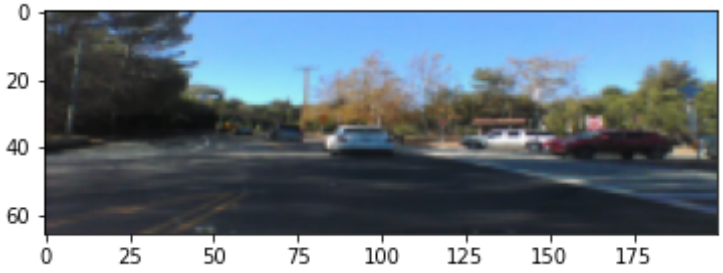



```
Predicted steering angle: -7.58008503049856degrees
```

Out[0]:

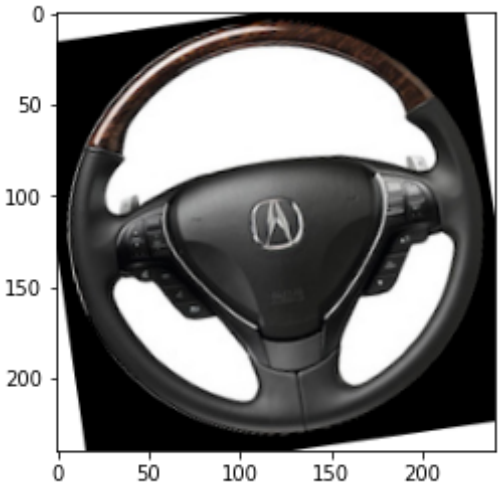


Out[0]:

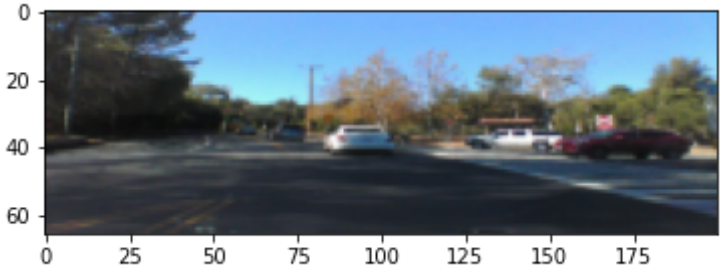



```
Predicted steering angle: -9.295475087716214degrees
```

Out[0]:



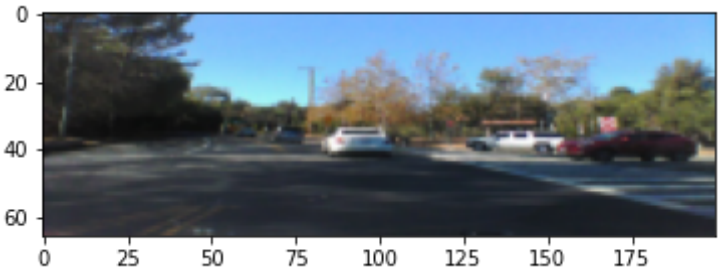
Out[0]:




```
Predicted steering angle: -8.777978975061028degrees
```

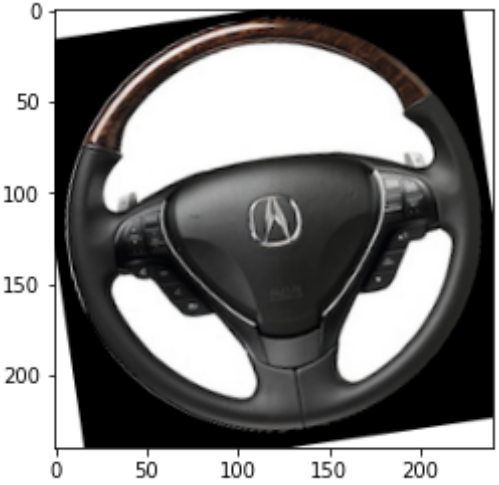
Out[0]:

Out[0]:

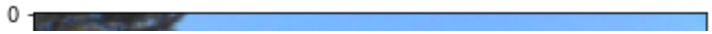



```
Predicted steering angle: -8.343044481545665degrees
```

Out[0]:

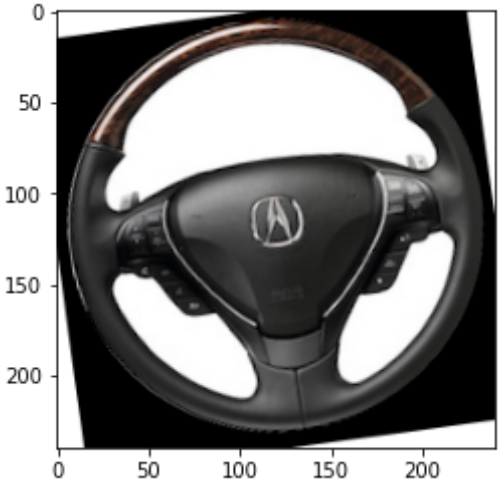


Out[0]:




```
Predicted steering angle: -3.4499686771348l4degrees
```

Out[0]:

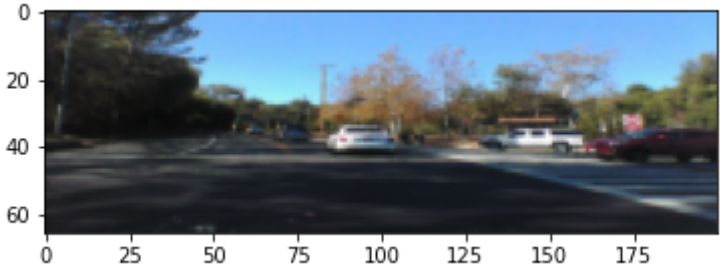


Out[0]:


```
Predicted steering angle: -1.4046958509311762degrees
```

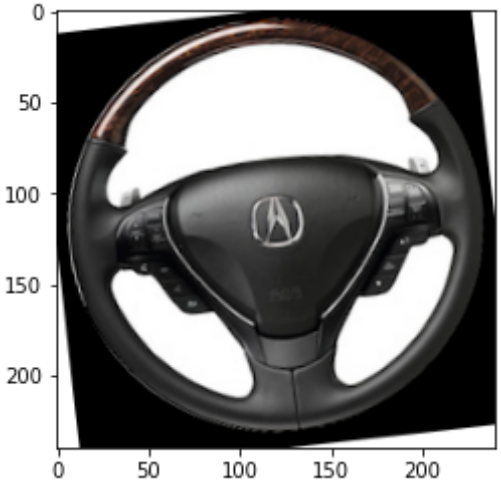
Out[0]:

Out[0]:




```
Predicted steering angle: -0.6710396189707l9degrees
```

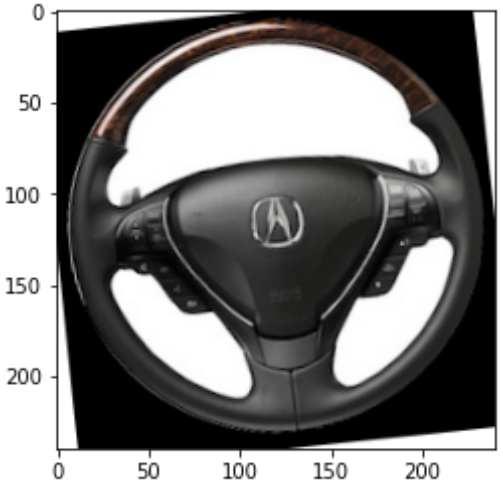
Out[0]:



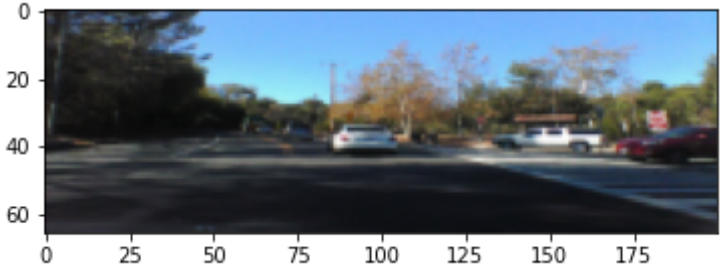
Out[0]:


```
Predicted steering angle: -3.0315120149921055degrees
```

Out[0]:

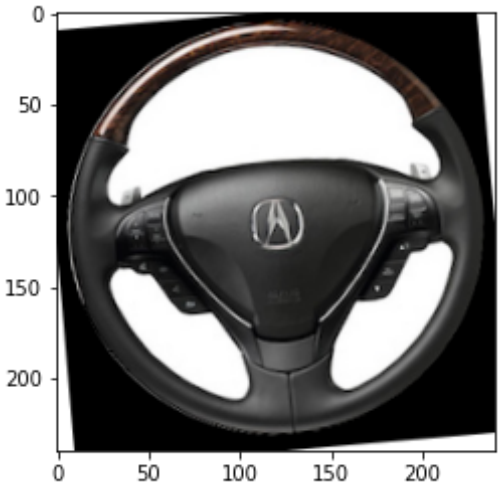


Out[0]:

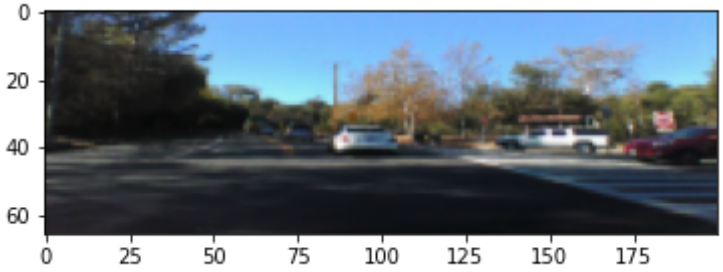



```
Predicted steering angle: 4.993516297476826degrees
```

Out[0]:

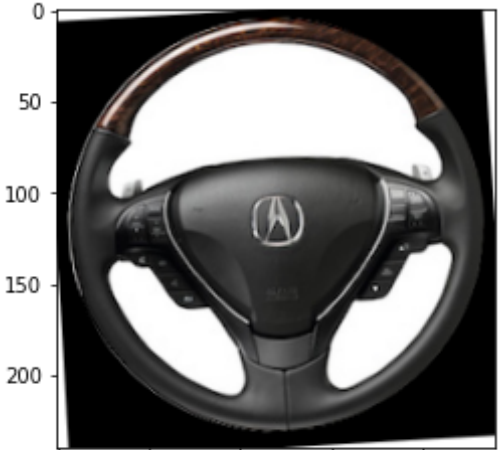


Out[0]:

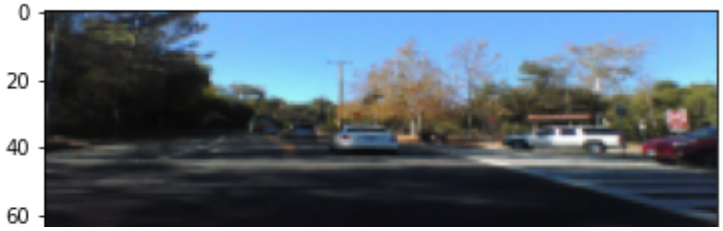



```
Predicted steering angle: 19.16047013144831degrees
```

Out[0]:

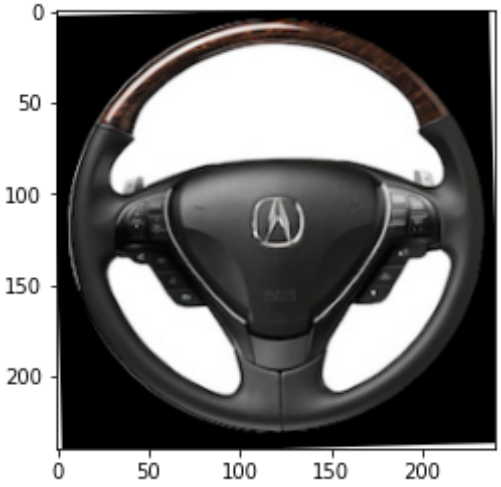


Out[0]:

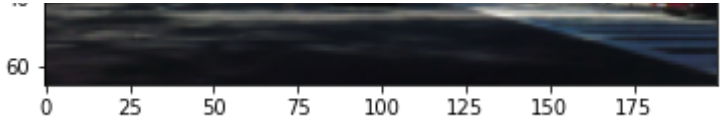



```
Predicted steering angle: 24.9536863212913 86degrees
```

Out[0]:

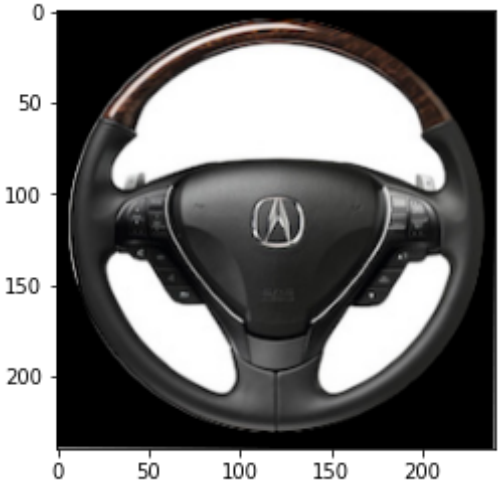


Out[0]:

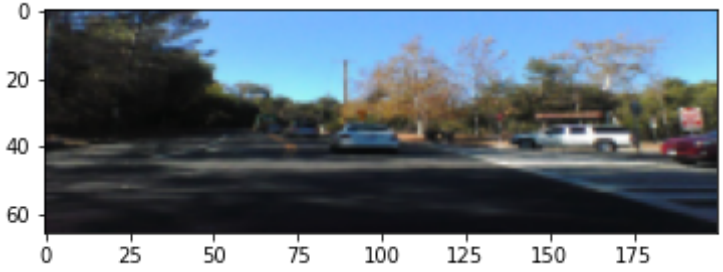



```
Predicted steering angle: 23.044221561449696degrees
```

Out[0]:



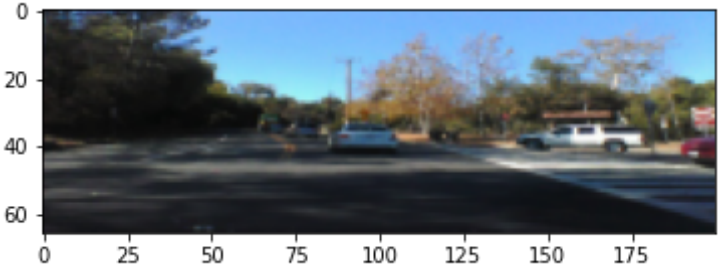
Out[0]:




```
Predicted steering angle: 26.054736721159536degrees
```

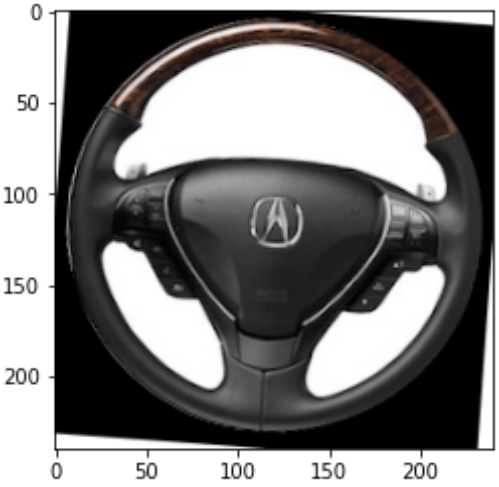
Out[0]:

Out[0]:

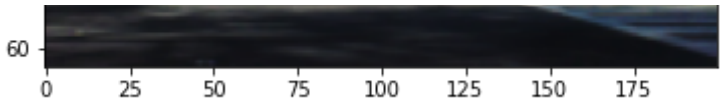



```
Predicted steering angle: 37.754946392039756degrees
```

Out[0]:

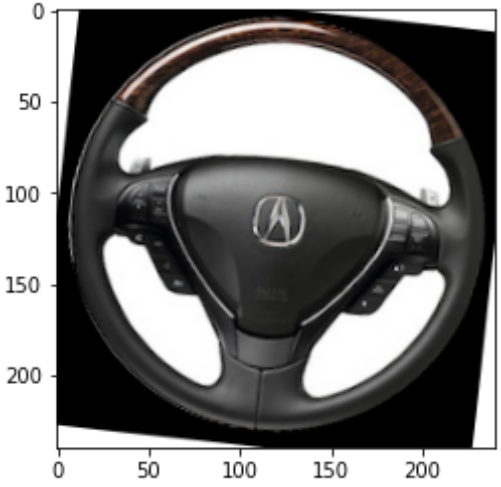


Out[0]:

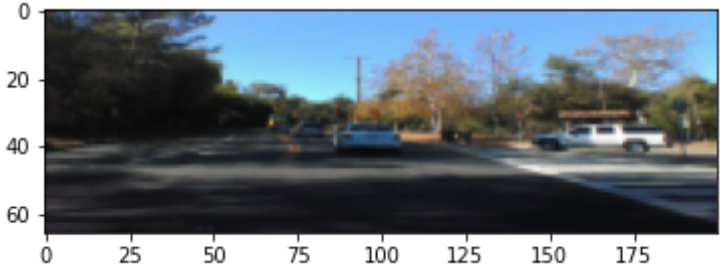



```
Predicted steering angle: 36.64120891578831degrees
```

Out[0]:

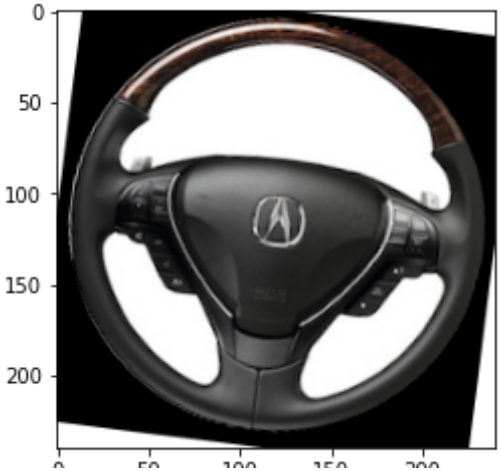


Out[0]:

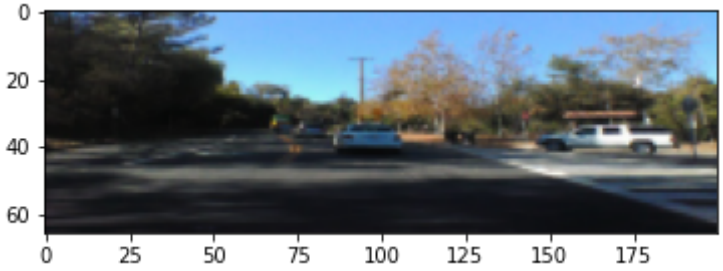


```
Predicted steering angle: 16.335937607743332degrees
```

Out[0]:



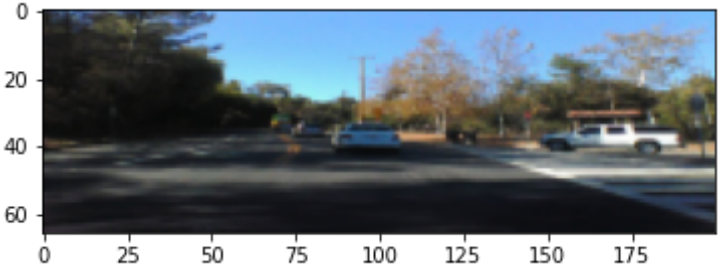
Out[0]:




```
Predicted steering angle: 9.470432090853384degrees
```

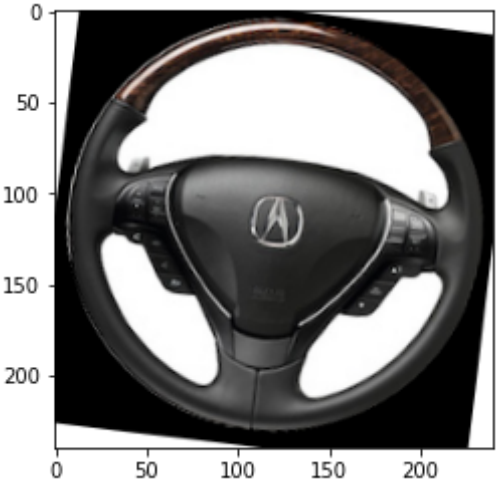
Out[0]:

Out[0]:

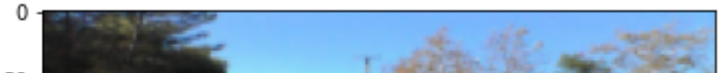



```
Predicted steering angle: 1.1778302638755564degrees
```

Out[0]:

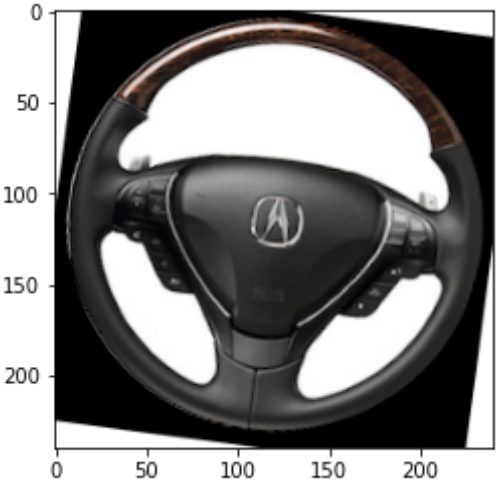


Out[0]:

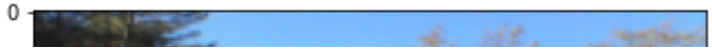



```
Predicted steering angle: 13.468625901719271degrees
```

Out[0]:

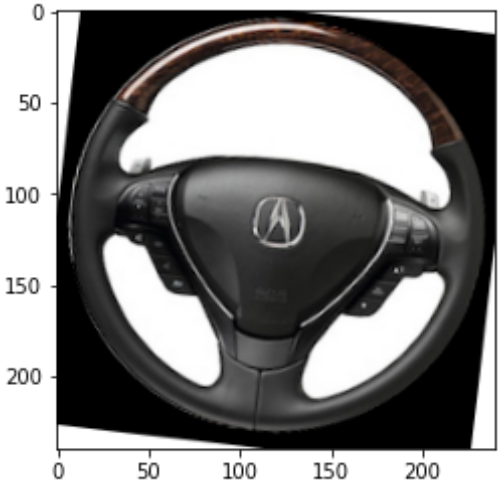


Out[0]:

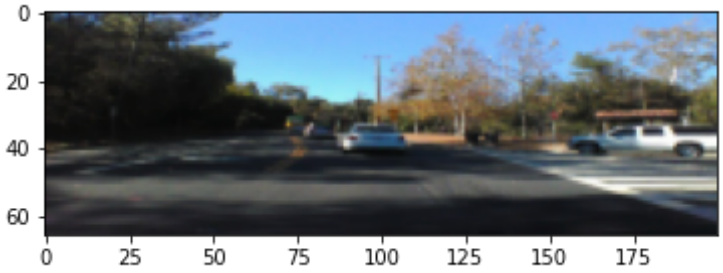



```
Predicted steering angle: -2.491796443193222degrees
```

Out[0]:



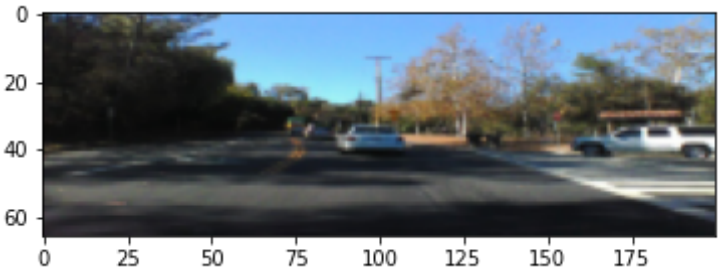
Out[0]:




```
Predicted steering angle: 8.176581672415052degrees
```

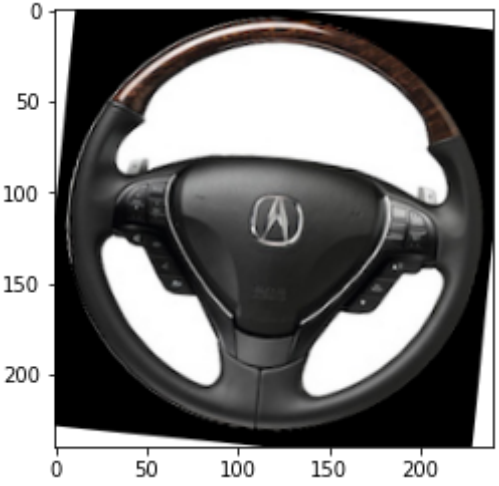
Out[0]:

Out[0]:

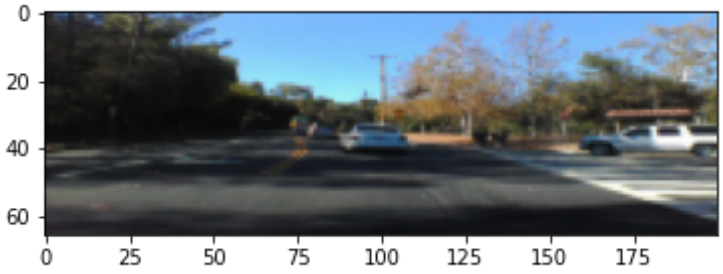



```
Predicted steering angle: -7.1681341235402884degrees
```

Out[0]:

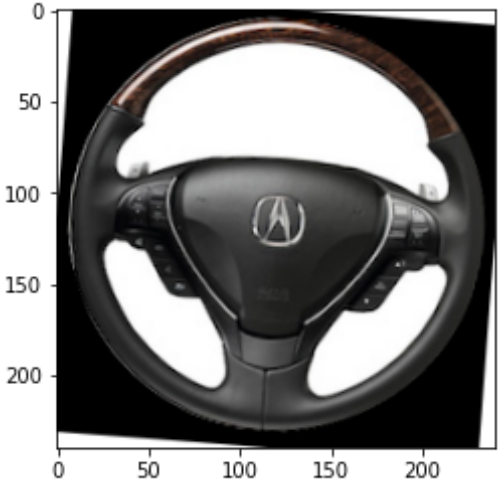


Out[0]:

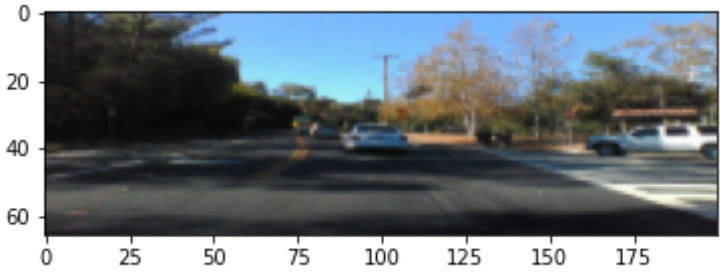



```
Predicted steering angle: -11.849668724072087degrees
```

Out[0]:

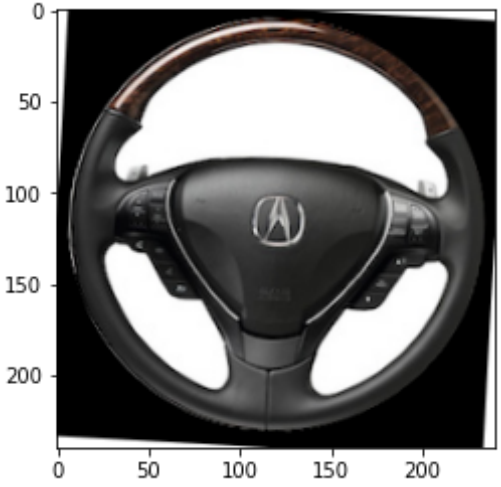


Out[0]:

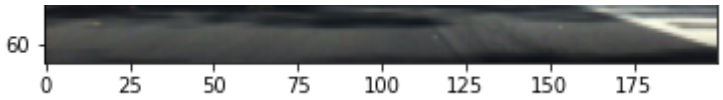



```
Predicted steering angle: -10.90487256184632degrees
```

Out[0]:

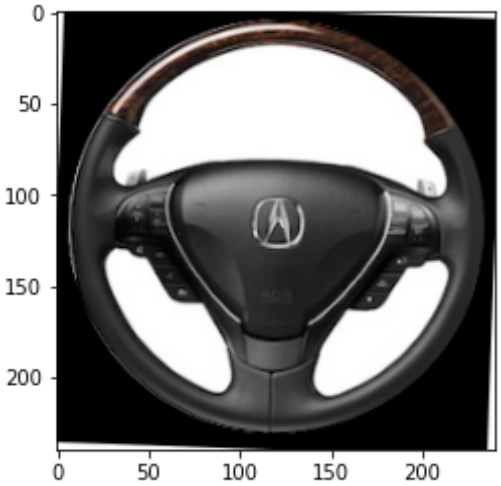


Out[0]:

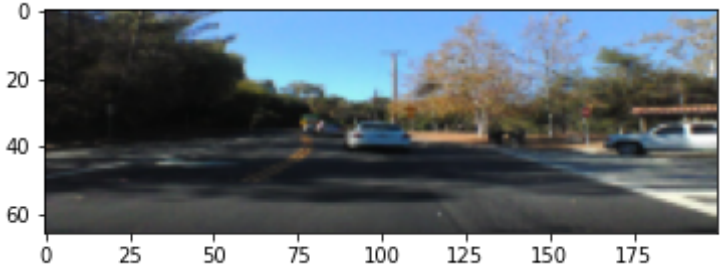



```
Predicted steering angle: -10.663937638874119degrees
```

Out[0]:



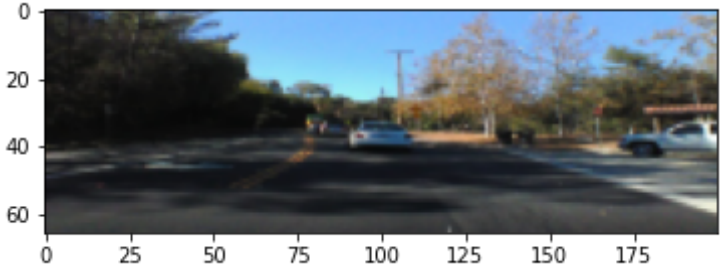
Out[0]:




```
Predicted steering angle: -10.874664342694645degrees
```

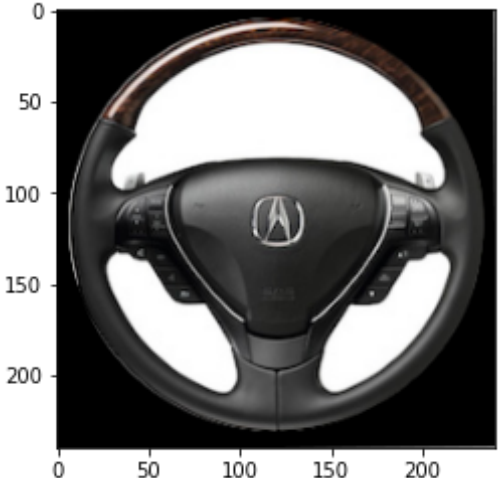
Out[0]:

Out[0]:




```
Predicted steering angle: -11.965640213537027degrees
```

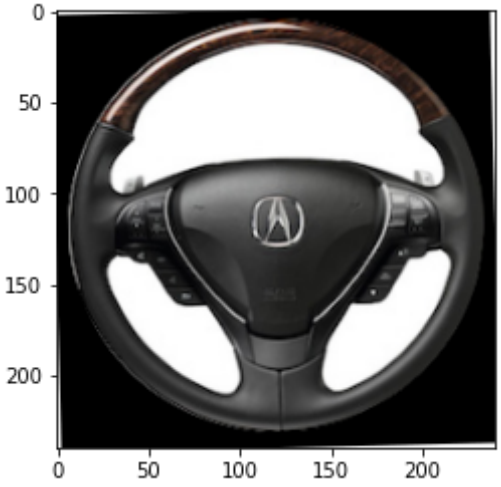
Out[0]:



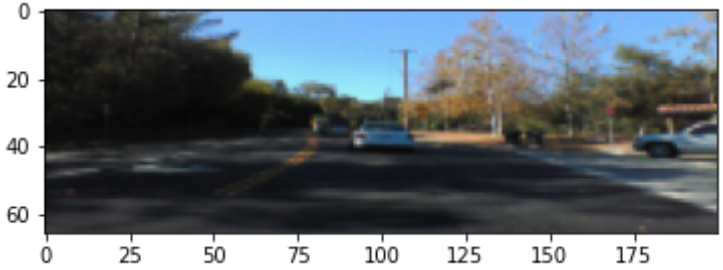
Out[0]:


```
Predicted steering angle: -12.047245606193046degrees
```

Out[0]:



Out[0]:

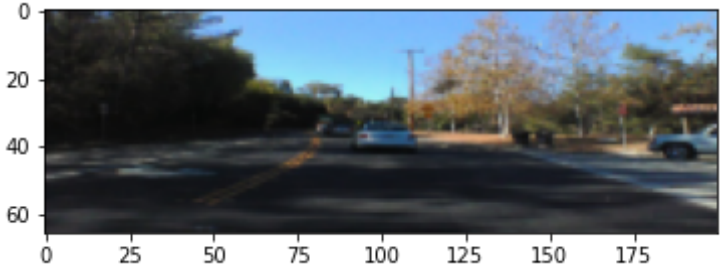



```
Predicted steering angle: -11.732259479786862degrees
```

Out[0]:

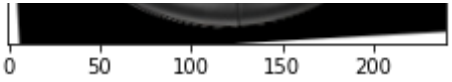
Out[0]:

Out[0]:

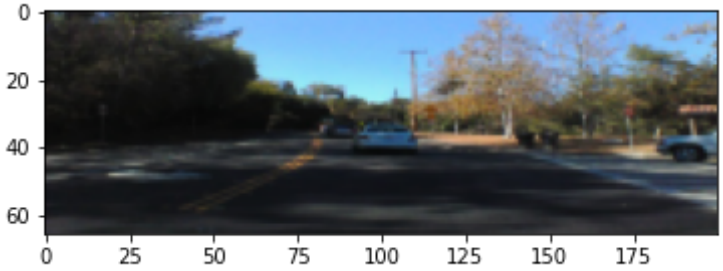



```
Predicted steering angle: -14.021342738603275degrees
```

Out[0]:

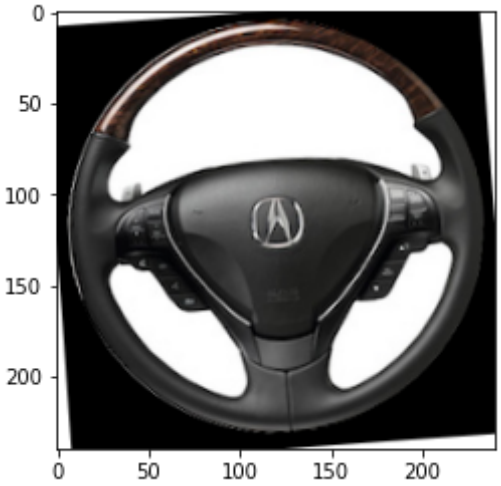


Out[0]:




```
Predicted steering angle: -11.8640838383154degrees
```

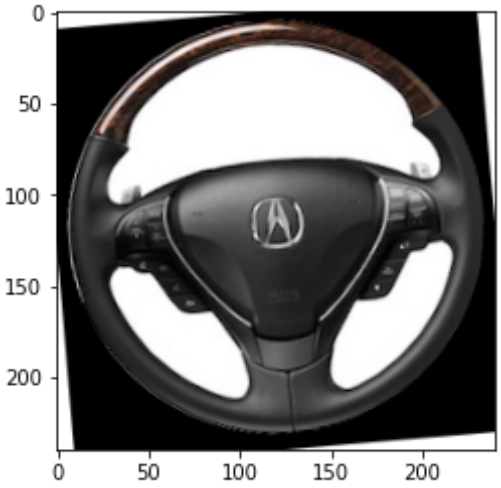
Out[0]:



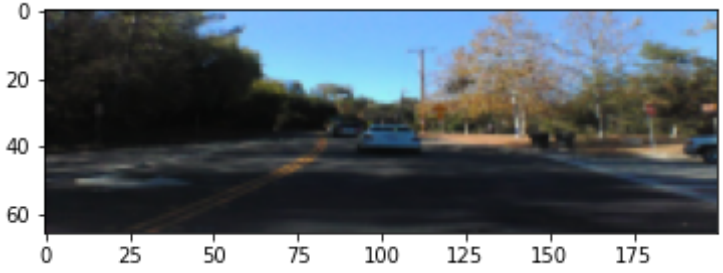
Out[0]:


```
Predicted steering angle: -11.480242574886315degrees
```

Out[0]:



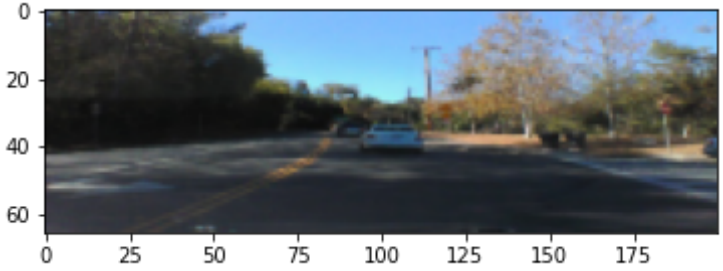
Out[0]:




```
Predicted steering angle: -11.095914660478869degrees
```

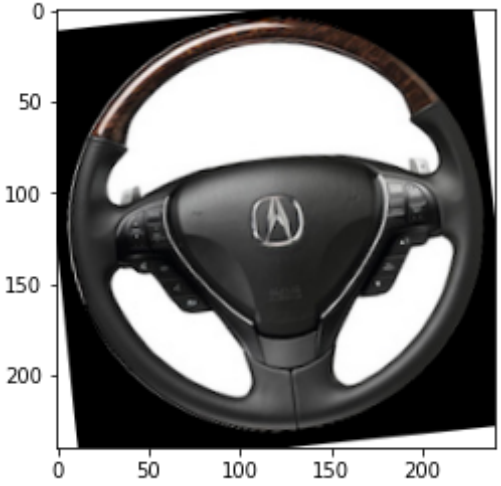
Out[0]:

Out[0]:

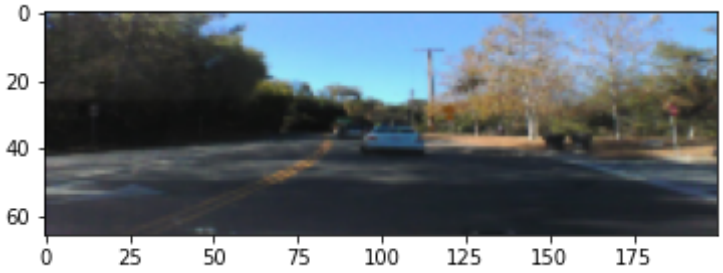



```
Predicted steering angle: -8.057621121414586degrees
```

Out[0]:

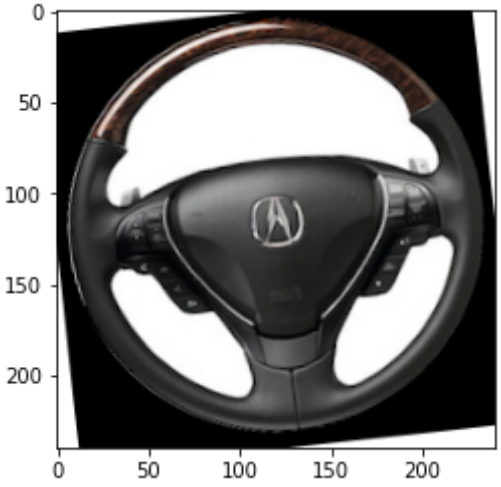


Out[0]:

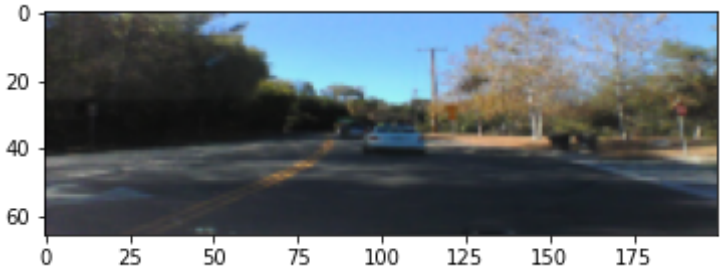



```
Predicted steering angle: -7.571116992118333degrees
```

Out[0]:

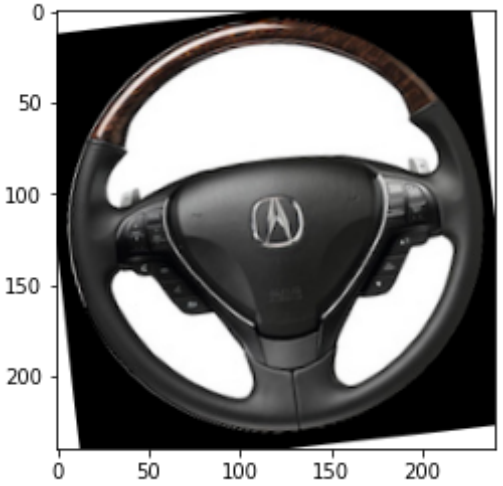


Out[0]:

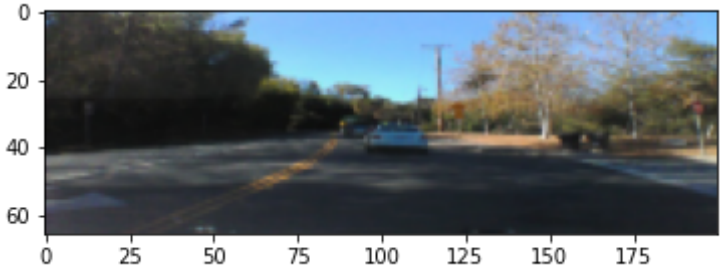


```
Predicted steering angle: -7.454815946025941degrees
```

Out[0]:



Out[0]:



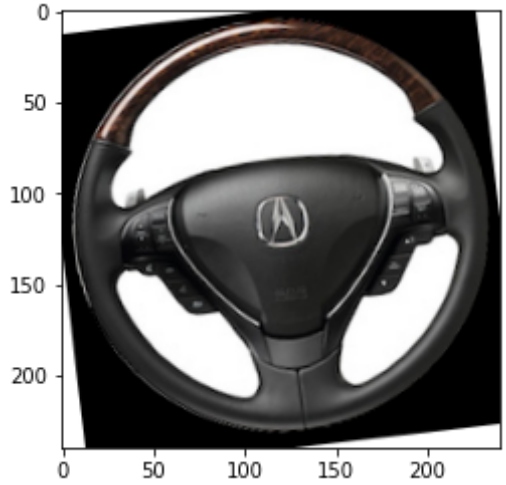

```
Predicted steering angle: -6.760856773521597degrees
```

Out[0]:

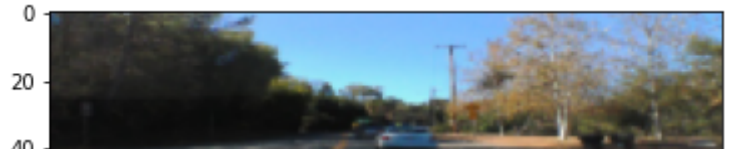
Out[0]:


```
Predicted steering angle: -6.928887964840374degrees
```

Out[0]:

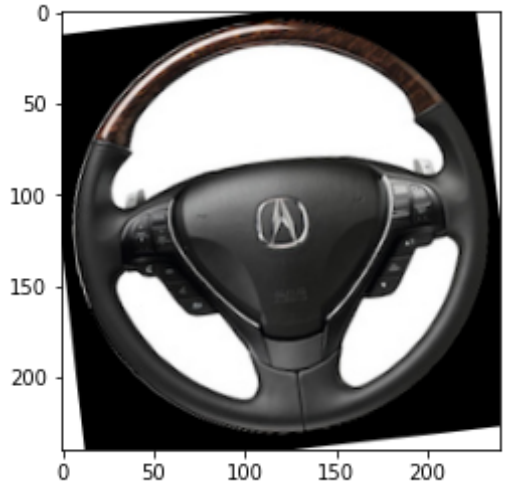


Out[0]:

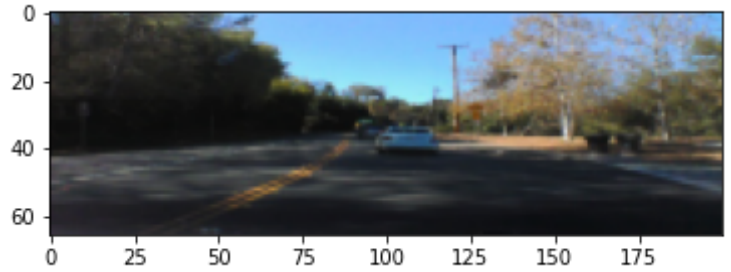



```
Predicted steering angle: -5.576870801656567degrees
```

Out[0]:



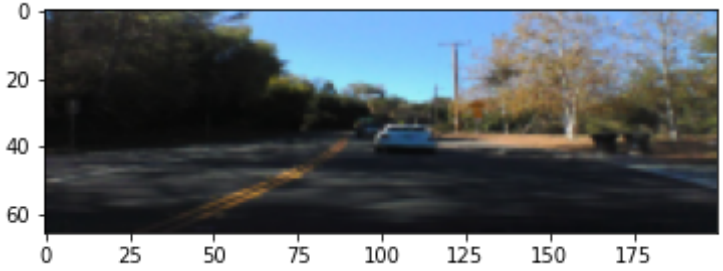
Out[0]:




```
Predicted steering angle: -4.9732238054527l8degrees
```

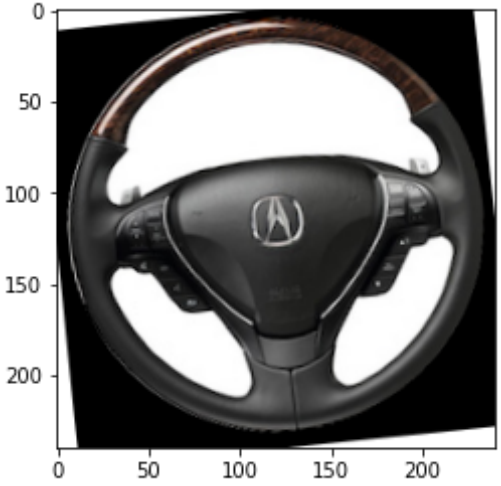
Out[0]:

Out[0]:




```
Predicted steering angle: -3.999100518478207degrees
```

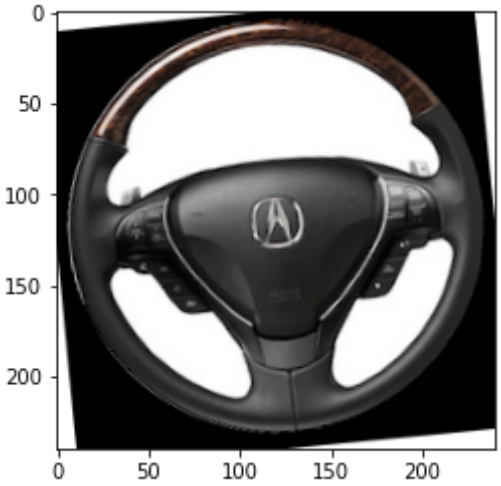
Out[0]:



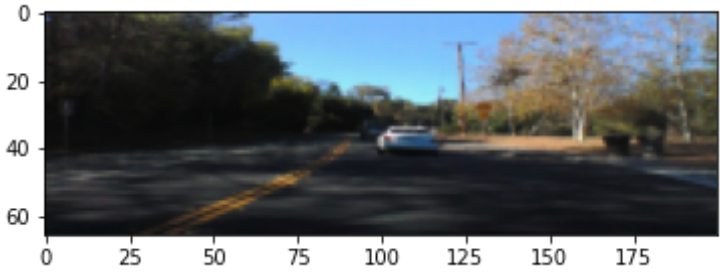
Out[0]:


```
Predicted steering angle: -3.9436521890223974degrees
```

Out[0]:

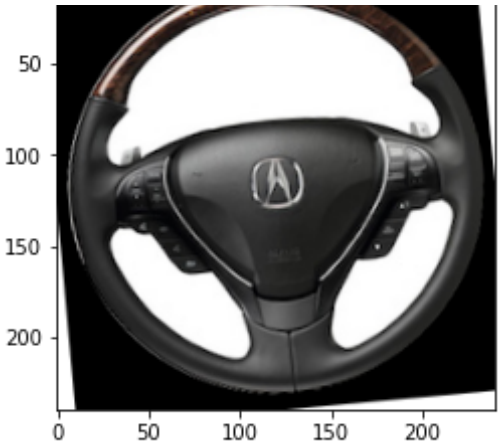


Out[0]:

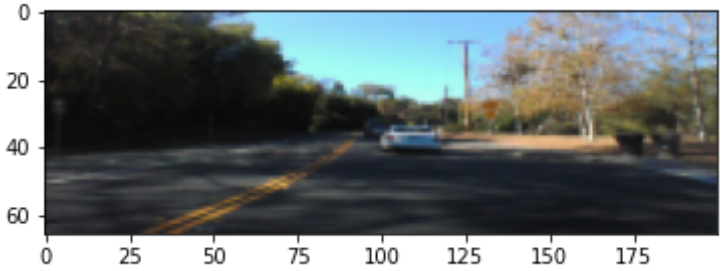



```
Predicted steering angle: -3.9255146216814283degrees
```

Out[0]:



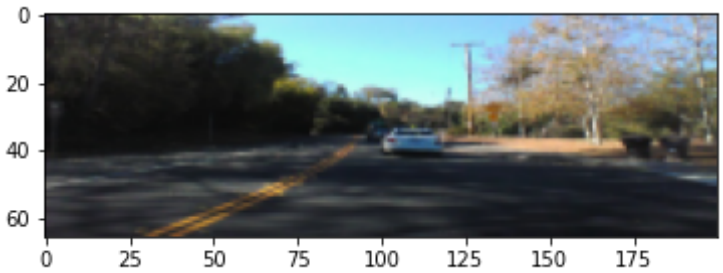
Out[0]:




```
Predicted steering angle: -3.144390282536675degrees
```

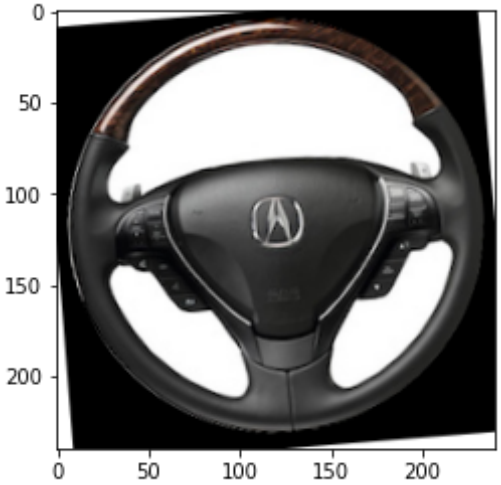
Out[0]:

Out[0]:

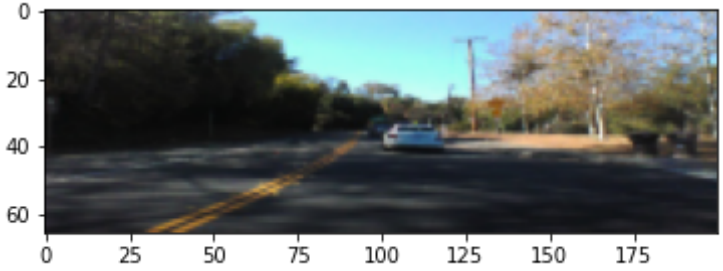



```
Predicted steering angle: -3.1094444734219513degrees
```

Out[0]:

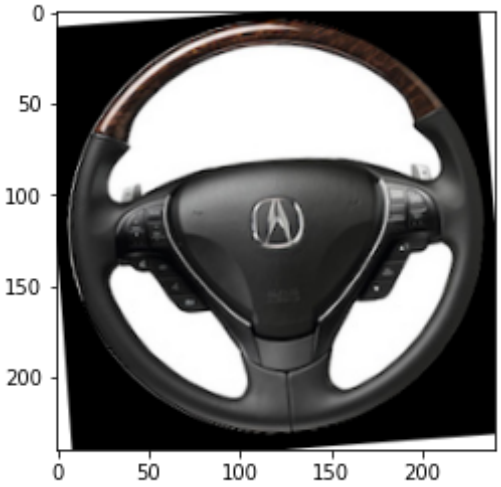


Out[0]:

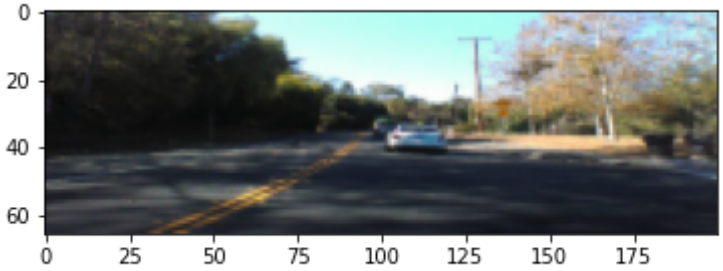



```
Predicted steering angle: -2.2809009427702296degrees
```

Out[0]:



Out[0]:



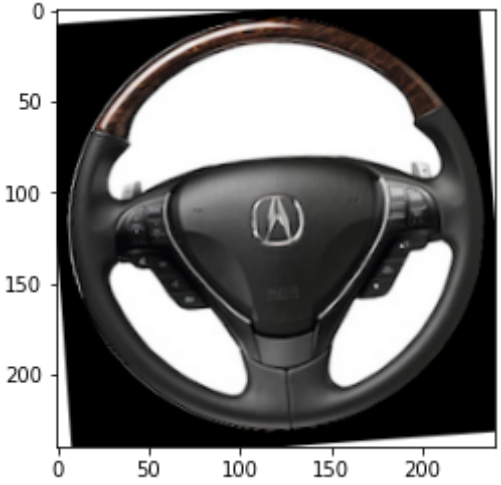

```
Predicted steering angle: -2.434146231503729degrees
```

Out[0]:

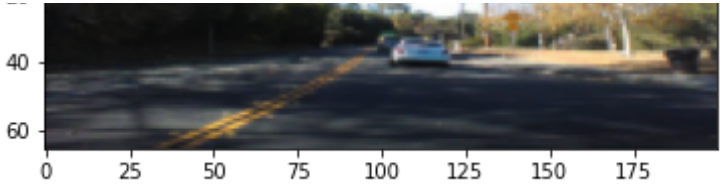
Out[0]:


```
Predicted steering angle: -4.6257652521849995degrees
```

Out[0]:

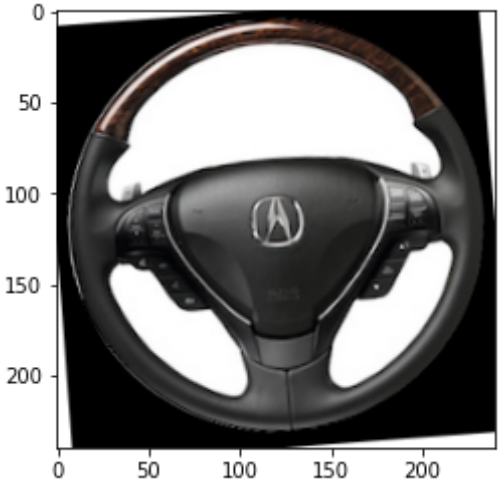


Out[0]:




```
Predicted steering angle: -5.008715175927397degrees
```

Out[0]:



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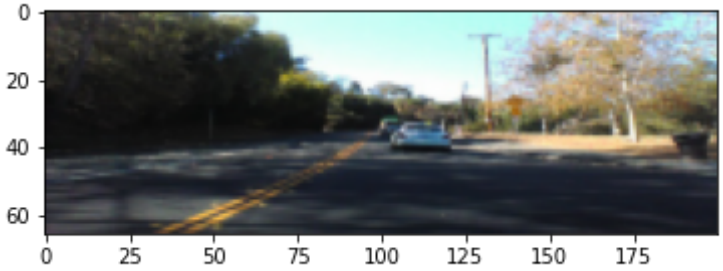
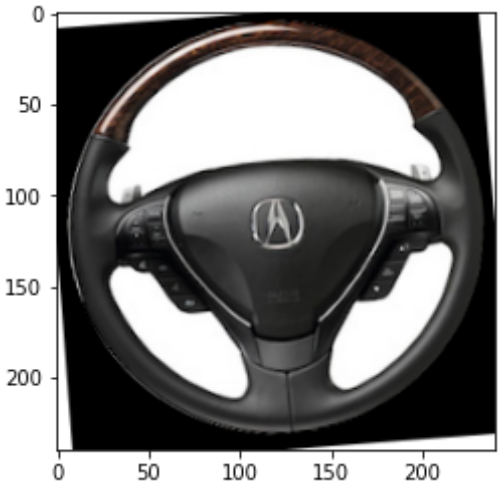



```
Predicted steering angle: -4.70712902689913degrees
```

Out[0]:



Out[0]: