road-detection.R

fizza

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```
library(EBImage)
library(keras)
```

```
##
## Attaching package: 'keras'
```

```
## The following object is masked from 'package:EBImage':
##
##     normalize
```

```
setwd("/Users/i Dolphin Online/Documents/road")
pics<-list.files(path="/Users/i Dolphin Online/Documents/road", pattern=".jpg",all.files=T)
mypic<-list()
for (i in 1:20) {mypic[[i]]<-readImage(pics[i])}
str(mypic)
```

```
## List of 20
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:1024, 1:640, 1:3] 0.0941 0.102 0.051 0.0471 0.0824 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 1024 640 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:165, 1:215, 1:3] 0.247 0.267 0.204 0.125 0.224 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 165 215 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:266, 1:189, 1:3] 0.659 0.659 0.659 0.663 0.663 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 266 189 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:259, 1:194, 1:3] 0.922 0.922 0.922 0.922 0.922 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 259 194 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:800, 1:450, 1:3] 0.831 0.812 0.804 0.816 0.827 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 800 450 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:400, 1:256, 1:3] 0.388 0.392 0.392 0.384 0.353 ...
##   .. ..@ colormode: int 2
```

```
##   .. ..$ dim: int [1:3] 400 256 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:640, 1:428, 1:3] 0.251 0.255 0.263 0.267 0.271 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 640 428 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:275, 1:183, 1:3] 0.482 0.482 0.482 0.482 0.482 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 275 183 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:250, 1:201, 1:3] 0.957 0.957 0.957 0.957 0.957 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 250 201 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:300, 1:168, 1:3] 0.361 0.388 0.396 0.376 0.345 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 300 168 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:290, 1:174, 1:3] 0.118 0.118 0.118 0.118 0.118 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 290 174 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:299, 1:168, 1:3] 0.0784 0.0745 0.0667 0.0588 0.0549 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 299 168 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:275, 1:184, 1:3] 0.0627 0.0627 0.0627 0.0627 0.0627 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 275 184 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:295, 1:171, 1:3] 0.969 0.969 0.969 0.969 0.969 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 295 171 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:275, 1:183, 1:3] 0.851 0.855 0.871 0.882 0.894 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 275 183 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:300, 1:168, 1:3] 0.231 0.231 0.231 0.231 0.227 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 300 168 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:1280, 1:720, 1:3] 0.451 0.451 0.451 0.451 0.451 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 1280 720 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:259, 1:194, 1:3] 0.627 0.627 0.627 0.627 0.627 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 259 194 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:336, 1:150, 1:3] 0.0275 0.2627 0.0392 0.2353 0.2706 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 336 150 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
```

```
##   .. ..@ .Data    : num [1:800, 1:538, 1:3] 0.102 0.118 0.129 0.133 0.133 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 800 538 3
```

```
for (i in 1:20) {mypic[[i]]<-resize(mypic[[i]], 224,224)}
str(mypic)
```

```
## List of 20
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.0585 0.1301 0.084 0.1211 0.1969 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.247 0.259 0.245 0.198 0.14 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.659 0.659 0.661 0.663 0.666 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.922 0.922 0.922 0.922 0.922 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.813 0.826 0.842 0.859 0.87 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.387 0.388 0.354 0.301 0.261 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.256 0.27 0.271 0.272 0.278 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.482 0.482 0.482 0.482 0.482 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.957 0.957 0.957 0.957 0.957 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.365 0.392 0.379 0.345 0.355 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.118 0.118 0.118 0.118 0.118 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.0778 0.0706 0.0601 0.0542 0.055 ...
```

```
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.0627 0.0627 0.0627 0.0627 0.0627 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.969 0.969 0.969 0.969 0.969 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.851 0.86 0.877 0.892 0.902 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.231 0.231 0.231 0.227 0.227 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.451 0.451 0.451 0.451 0.447 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.627 0.627 0.627 0.627 0.627 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.0863 0.0951 0.2441 0.0706 0.051 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
##  $ :Formal class 'Image' [package "EBImage"] with 2 slots
##   .. ..@ .Data    : num [1:224, 1:224, 1:3] 0.111 0.127 0.133 0.122 0.128 ...
##   .. ..@ colormode: int 2
##   .. ..$ dim: int [1:3] 224 224 3
```

```
display(mypic[[4]])
```

```
for (i in 1:20) {mypic[[i]]<-array_reshape(mypic[[i]], c(224,224,3))}
trainx <-NULL
for (i in 1:7) {trainx<- rbind(trainx,mypic[[i]])}
str(trainx)
```

```
##  num [1:7, 1:150528] 0.0585 0.2471 0.6588 0.9216 0.8135 ...
```

```
for (i in 11:17) {trainx<- rbind(trainx,mypic[[i]])}
str(trainx)
```

```
##  num [1:14, 1:150528] 0.0585 0.2471 0.6588 0.9216 0.8135 ...
```

```
testx<-NULL
for (i in 8:10) {testx<- rbind(testx,mypic[[i]])}
for (i in 18:20) {testx<- rbind(testx,mypic[[i]])}
str(testx)
```

```
##  num [1:6, 1:150528] 0.4824 0.9569 0.3654 0.6275 0.0863 ...
```

```
trainy<-c(0,0,0,0,0,0,0,1,1,1,1,1,1,1)
testy<-c(0,0,0,1,1,1)
library(keras)
trainlabels<-to_categorical(trainy)
testlabels<-to_categorical(testy)
```

```
model <-keras_model_sequential()
model%>%
  layer_dense(units=256,activation = 'relu',input_shape = c(150528)) %>%
  layer_dense(units = 126,activation = 'relu') %>%
  layer_dense(units=2,activation = 'softmax')
summary(model)
```

```
## Model: "sequential"
## _________________________________________________________________________________
## Layer (type)                         Output Shape                      Param #
## =================================================================================
## dense_2 (Dense)                      (None, 256)                       38535424
## _________________________________________________________________________________
## dense_1 (Dense)                      (None, 126)                       32382
## _________________________________________________________________________________
## dense (Dense)                        (None, 2)                         254
## =================================================================================
## Total params: 38,568,060
## Trainable params: 38,568,060
## Non-trainable params: 0
## _________________________________________________________________________________
```

```
model %>%
  compile(loss='binary_crossentropy',optimizer=optimizer_rmsprop(),metrics=c('accuracy'))
history <- model%>%
  fit(trainx,trainlabels,epochs=30,batch_size=3,validation_split=0.2)
model%>%evaluate(trainx,trainlabels)
```

```
##     loss accuracy
## 7.668547 0.500000
```

```
pred<-model%>% predict_classes(testx)
```

```
## Warning in predict_classes(., testx): `predict_classes()` is deprecated and and was removed from tens
## Please update your code:
##   * If your model does multi-class classification:
##     (e.g. if it uses a `softmax` last-layer activation).
##
##       model %>% predict(x) %>% k_argmax()
##
##   * if your model does binary classification
##     (e.g. if it uses a `sigmoid` last-layer activation).
##
##       model %>% predict(x) %>% `>`(0.5) %>% k_cast("int32")
```

```
table(Predicted=pred,Actual=testy)
```

```
##          Actual
## Predicted 0 1
##         0 3 3
```