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September 2, 2019

1 DonorsChoose

DonorsChoose.org receives hundreds of thousands of project proposals each year for classroom projects in need of funding. Right now, a large number of volunteers is needed to manually screen each submission before it's approved to be posted on the DonorsChoose.org website.

Next year, DonorsChoose.org expects to receive close to 500,000 project proposals. As a result, there are three main problems they need to solve:

How to scale current manual processes and resources to screen 500,000 projects so that they can be posted as quickly and as efficiently as possible

```
<li>How to increase the consistency of project vetting across different volunteers to improve t
<li>How to focus volunteer time on the applications that need the most assistance</li>
</ul>
```

The goal of the competition is to predict whether or not a DonorsChoose.org project proposal submitted by a teacher will be approved, using the text of project descriptions as well as additional metadata about the project, teacher, and school. DonorsChoose.org can then use this information to identify projects most likely to need further review before approval.

1.1 About the DonorsChoose Data Set

The `train.csv` data set provided by DonorsChoose contains the following features:

Feature	Description
`project_id`	A unique identifier for the proposed project. **Example:** `p036502`

`project_title` | Title of the project. **Examples:**

Art Will Make You Happy!

First Grade Fun

`project_grade_category` | Grade level of students for which the project is targeted. One of the following enumerated values:

Grades PreK-2

Grades 3-5

Grades 6-8

Grades 9-12

`project_subject_categories` | One or more (comma-separated) subject categories for the

project from the following enumerated list of values:

Applied Learning
Care & Hunger
Health & Sports
History & Civics
Literacy & Language
Math & Science
Music & The Arts
Special Needs
Warmth

Examples:

Music & The Arts
Literacy & Language, Math & Science

`school_state` | State where school is located (Two-letter U.S. postal code). **Example:** `WY`
`project_subject_subcategories` | One or more (comma-separated) subject subcategories for the project. **Examples:**

Literacy
Literature & Writing, Social Sciences

`project_resource_summary` | An explanation of the resources needed for the project. **Example:**

My students need hands on literacy materials to manage sensory needs!</code

`project_essay_1` | First application essay
`project_essay_2` | *Second application essay* `project_essay_3` | Third application essay `project_essay_4` | *Fourth application essay* `project_submitted_datetime` | Datetime when project application was submitted. **Example:** `2016-04-28 12:43:56.245`
`teacher_id` | A unique identifier for the teacher of the proposed project. **Example:** `bdf8baa8fedef6bfeec7ae4ff1c15c56`
`teacher_prefix` | Teacher's title. One of the following enumerated values:

nan
Dr.
Mr.
Mrs.
Ms.
Teacher.

`teacher_number_of_previously_posted_projects` | Number of project applications previously submitted by the same teacher. **Example:** `2`

* See the section Notes on the Essay Data for more details about these features.

Additionally, the `resources.csv` data set provides more data about the resources required for each project. Each line in this file represents a resource required by a project:

Feature	Description
`id`	A `project_id` value from the `train.csv` file. **Example:** `p036502`
`description`	Desciption of the resource. **Example:** `Tenor Saxophone Reeds, Box of 25`
`quantity`	Quantity of the resource required. **Example:** `3`
`price`	Price of the resource required. **Example:** `9.95`

Note: Many projects require multiple resources. The `id` value corresponds to a `project_id` in train.csv, so you use it as a key to retrieve all resources needed for a project:

The data set contains the following label (the value you will attempt to predict):

Label	Description
`project_is_approved`	A binary flag indicating whether DonorsChoose approved the project. A value of `0` indicates the project was not approved, and a value of `1` indicates the project was approved.

1.1.1 Notes on the Essay Data

Prior to May 17, 2016, the prompts for the essays were as follows:

project_essay_1: "Introduce us to your classroom"

project_essay_2: "Tell us more about your students"

project_essay_3: "Describe how your students will use the materials you're requesting"

project_essay_3: "Close by sharing why your project will make a difference"

Starting on May 17, 2016, the number of essays was reduced from 4 to 2, and the prompts for the first 2 essays were changed to the following:

project_essay_1: "Describe your students: What makes your students special? Specific details about their background, your neighborhood, and your school are all helpful."

project_essay_2: "About your project: How will these materials make a difference in your students' learning and improve their school lives?"

For all projects with project_submitted_datetime of 2016-05-17 and later, the values of project_essay_3 and project_essay_4 will be NaN.

[1]:
```
import pandas as pd
preprocessed_data = pd.read_csv('preprocessed_data.csv')
y=preprocessed_data.project_is_approved
X = preprocessed_data
#print(X.columns)
```

[2]:
```
import numpy as np
import tensorflow as tf
from sklearn.metrics import roc_auc_score
from sklearn.datasets import make_classification
from keras.models import Sequential
from keras.layers import Dense
from keras.utils import np_utils
from keras.callbacks import Callback
from keras.models import load_model
%matplotlib inline


# define roc_callback, inspired by https://github.com/keras-team/keras/issues/
 ↪6050#issuecomment-329996505
def auc_roc(y_true, y_pred):
    return tf.py_func(roc_auc_score, (y_true, y_pred), tf.double)
```

```
#method which converts pandas series to one hot encoded numpy array
def dfToTokenize(x,vocab):
    result=np.zeros(shape=(x.shape[0],1))
    for a,b in enumerate(x.values):
        try:
            result[a] = vocab.index(b)+1
        except:
            result[a] = 0
    return result
```

```
Using TensorFlow backend.
```

[3]:
```
# xx = dfToTokenize(X_train.school_state,X_train.school_state.unique().
 ↪tolist())
# print(xx.shape)
# print(xx)
```

[4]:
```
from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,␣
 ↪random_state=42)
```

2.2.2 Numerical features

[5]:
```
# check this one: https://www.youtube.com/watch?v=0HOqOcln3Z4&t=530s
# standardization sklearn: https://scikit-learn.org/stable/modules/generated/
 ↪sklearn.preprocessing.StandardScaler.html
from sklearn.preprocessing import StandardScaler

# price_standardized = standardScalar.fit(project_data['price'].values)
# this will rise the error
# ValueError: Expected 2D array, got 1D array instead: array=[725.05 213.03 329.
 ↪   ... 399.   287.73   5.5 ].
# Reshape your data either using array.reshape(-1, 1)

price_scalar = StandardScaler()
price_scalar.fit(X_train['price'].values.reshape(-1,1)) # finding the mean and␣
 ↪standard deviation of this data
print(f"Mean : {price_scalar.mean_[0]}, Standard deviation : {np.
 ↪sqrt(price_scalar.var_[0])}")

# Now standardize the data with above maen and variance.
price_standardized_train = price_scalar.transform(X_train['price'].values.
 ↪reshape(-1, 1))
# Now standardize the data with above maen and variance.
price_standardized_test = price_scalar.transform(X_test['price'].values.
 ↪reshape(-1, 1))
```

```
Mean : 297.9976013181079, Standard deviation : 367.694468186091
```

[6]:
```
# check this one: https://www.youtube.com/watch?v=0HOqOcln3Z4&t=530s
# standardization sklearn: https://scikit-learn.org/stable/modules/generated/
 ↪sklearn.preprocessing.StandardScaler.html
from sklearn.preprocessing import StandardScaler,normalize

# price_standardized = standardScalar.fit(project_data['price'].values)
# this will rise the error
# ValueError: Expected 2D array, got 1D array instead: array=[725.05 213.03 329.
 ↪    ... 399.    287.73    5.5 ].
# Reshape your data either using array.reshape(-1, 1)

price_scalar = StandardScaler()
price_scalar.fit(X_train['teacher_number_of_previously_posted_projects'].values.
 ↪reshape(-1,1)) # finding the mean and standard deviation of this data
print(f"Mean : {price_scalar.mean_[0]}, Standard deviation : {np.
 ↪sqrt(price_scalar.var_[0])}")

# Now standardize the data with above maen and variance.
teacher_number_of_previously_posted_projects_standardized_train = price_scalar.
 ↪transform(X_train['teacher_number_of_previously_posted_projects'].values.
 ↪reshape(-1, 1))

# Now standardize the data with above maen and variance.
teacher_number_of_previously_posted_projects_standardized_test = price_scalar.
 ↪transform(X_test['teacher_number_of_previously_posted_projects'].values.
 ↪reshape(-1, 1))
```

```
Mean : 11.105425753449735, Standard deviation : 27.570611837989286
```

2 Model1

[7]:
```
# https://machinelearningmastery.com/
 ↪use-word-embedding-layers-deep-learning-keras/

from keras.preprocessing.sequence import pad_sequences
from keras.preprocessing.text import Tokenizer
import numpy as np
# prepare tokenizer
t = Tokenizer()
t.fit_on_texts(X_train.essay)
vocab_size = len(t.word_index) + 1
# integer encode the documents
encoded_docs_text_train = t.texts_to_sequences(X_train.essay)
#print(encoded_docs)
# pad documents to a max length of 4 words
max_length = 600
```

```
padded_docs_text_train = pad_sequences(encoded_docs_text_train,␣
 ↪maxlen=max_length, padding='pre')
#print(padded_docs[0])
print(len(padded_docs_text_train))
print(len(padded_docs_text_train[0]))

# load the whole embedding into memory
embeddings_index = dict()
f = open('glove.42B.300d.txt', 'r', encoding="utf8")
for line in f:
    values = line.split()
    word = values[0]
    coefs = np.asarray(values[1:], dtype='float32')
    embeddings_index[word] = coefs
f.close()
print('Loaded %s word vectors.' % len(embeddings_index))
# create a weight matrix for words in training docs
embedding_matrix = np.zeros((vocab_size, 300))
for word, i in t.word_index.items():
    embedding_vector = embeddings_index.get(word)
    if embedding_vector is not None:
        embedding_matrix[i] = embedding_vector
```

```
87398
600
Loaded 1917495 word vectors.
```

[8]:
```
encoded_docs_text_test = t.texts_to_sequences(X_test.essay)
#print(encoded_docs)
# pad documents to a max length of 4 words
max_length = 600
padded_docs_text_test = pad_sequences(encoded_docs_text_test,␣
 ↪maxlen=max_length, padding='pre')
#print(padded_docs[0])
print(len(padded_docs_text_train))
print(len(padded_docs_text_train[0]))
```

```
87398
600
```

[9]:
```
from keras.layers import Input, Embedding, LSTM, Dense, concatenate, Flatten
from keras.models import Model
first_input = Input(shape=(600,))
e = Embedding(vocab_size, 300, weights=[embedding_matrix], input_length=600,␣
 ↪trainable=False)(first_input)
lstm_out=LSTM(32)(e)
```

```
WARNING: Logging before flag parsing goes to stderr.
W0901 23:53:05.547688  7292 deprecation_wrapper.py:119] From
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\keras\backend\tensorflow_backend.py:74: The name tf.get_default_graph
is deprecated. Please use tf.compat.v1.get_default_graph instead.

W0901 23:53:05.614509  7292 deprecation_wrapper.py:119] From
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\keras\backend\tensorflow_backend.py:519: The name tf.placeholder is
deprecated. Please use tf.compat.v1.placeholder instead.

W0901 23:53:05.631468  7292 deprecation_wrapper.py:119] From
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\keras\backend\tensorflow_backend.py:4140: The name tf.random_uniform is
deprecated. Please use tf.random.uniform instead.

W0901 23:53:05.656401  7292 deprecation_wrapper.py:119] From
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\keras\backend\tensorflow_backend.py:174: The name
tf.get_default_session is deprecated. Please use
tf.compat.v1.get_default_session instead.

W0901 23:53:05.657397  7292 deprecation_wrapper.py:119] From
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\keras\backend\tensorflow_backend.py:181: The name tf.ConfigProto is
deprecated. Please use tf.compat.v1.ConfigProto instead.
```

[10]:
```
encoded_docs_school_state_train = dfToTokenize(X_train.school_state,X_train.
 ↪school_state.unique().tolist())
print(encoded_docs_school_state_train.shape)
encoded_docs_school_state_test = dfToTokenize(X_test.school_state,X_train.
 ↪school_state.unique().tolist())


encoded_docs_project_grade_category_train = dfToTokenize(X_train.
 ↪project_grade_category,X_train.project_grade_category.unique().tolist())
encoded_docs_project_grade_category_test = dfToTokenize(X_test.
 ↪project_grade_category,X_train.project_grade_category.unique().tolist())


encoded_docs_clean_categories_train = dfToTokenize(X_train.
 ↪clean_categories,X_train.clean_categories.unique().tolist())
encoded_docs_clean_categories_test = dfToTokenize(X_test.
 ↪clean_categories,X_train.clean_categories.unique().tolist())
```

```
encoded_docs_clean_subcategories_train = dfToTokenize(X_train.
 ↪clean_subcategories,X_train.clean_subcategories.unique().tolist())
encoded_docs_clean_subcategories_test = dfToTokenize(X_test.
 ↪clean_subcategories,X_train.clean_subcategories.unique().tolist())

encoded_docs_teacher_prefix_train = dfToTokenize(X_train.teacher_prefix,X_train.
 ↪teacher_prefix.unique().tolist())
encoded_docs_teacher_prefix_test = dfToTokenize(X_test.teacher_prefix,X_train.
 ↪teacher_prefix.unique().tolist())
```

```
(87398, 1)
```

[11]:
```
from keras.layers.merge import concatenate
from keras.models import Model, Sequential
from keras.layers import Dense, Input, Dropout

vocab_size1 = len(X_train.school_state.unique().tolist()) + 1
model1_in = Input(shape=(1,))
x = Embedding(vocab_size1 ,10,input_shape=(vocab_size1,))(model1_in)
model1_out = Flatten()(x)
model1 = Model(model1_in, model1_out)
#print(model1.summary())



vocab_size2 = len(X_train.project_grade_category.unique().tolist()) + 1
model2_in = Input(shape=(1,))
y = Embedding(vocab_size2 ,10,input_shape=(vocab_size2,))(model2_in)
model2_out = Flatten()(y)
model2 = Model(model2_in, model2_out)
#print(model2.summary())


vocab_size3 = len(X_train.clean_categories.unique().tolist())  + 1
model3_in = Input(shape=(encoded_docs_clean_categories_train.shape[1],))
y = Embedding(vocab_size3 ,10,input_shape=(vocab_size3,))(model3_in)
model3_out = Flatten()(y)
model3 = Model(model3_in, model3_out)


vocab_size4 = len(X_train.clean_subcategories.unique().tolist()) + 1
model4_in = Input(shape=(encoded_docs_clean_subcategories_train.shape[1],))
y = Embedding(vocab_size4 ,10,input_shape=(vocab_size4,))(model4_in)
model4_out = Flatten()(y)
model4 = Model(model4_in, model4_out)
```

```
vocab_size5 = len(X_train.teacher_prefix.unique().tolist()) + 1
model5_in = Input(shape=(encoded_docs_teacher_prefix_train.shape[1],))
y = Embedding(vocab_size5 ,10,input_shape=(vocab_size5,))(model5_in)
model5_out = Flatten()(y)
model5 = Model(model5_in, model5_out)


model6_in = Input(shape=(2,))
model6_out = Dense(5, activation='relu')(model6_in)
```

[12]:
```
concatenated = concatenate([lstm_out, model1_out, model2_out, model3_out,␣
 ↪model4_out, model5_out, model6_out])
intermediate_out = Dense(1024, activation='relu')(concatenated)
out=Dropout(0.3)(intermediate_out)
out=Dense(512, activation='relu')(out)
out=Dropout(0.3)(out)
out=Dense(128, activation='relu')(out)
out=Dense(1, activation='sigmoid', name='main_output')(out)

merged_model1 = Model(inputs= [first_input,model1_in, model2_in, model3_in,␣
 ↪model4_in, model5_in, model6_in], outputs=[out])
print(merged_model1.summary())
```

```
W0901 23:53:09.587028  7292 deprecation.py:506] From
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\keras\backend\tensorflow_backend.py:3447: calling dropout (from
tensorflow.python.ops.nn_ops) with keep_prob is deprecated and will be removed
in a future version.
Instructions for updating:
Please use `rate` instead of `keep_prob`. Rate should be set to `rate = 1 -
keep_prob`.

_________________________________________________________________________________
__________________
Layer (type)                 Output Shape              Param #     Connected to
=================================================================================
==================
input_1 (InputLayer)         (None, 600)               0
_________________________________________________________________________________
__________________
input_2 (InputLayer)         (None, 1)                 0
_________________________________________________________________________________
__________________
input_3 (InputLayer)         (None, 1)                 0
_________________________________________________________________________________
__________________
input_4 (InputLayer)         (None, 1)                 0
```

```
____________________________________________________________________________
__________________
input_5 (InputLayer)            (None, 1)            0
____________________________________________________________________________
__________________
input_6 (InputLayer)            (None, 1)            0
____________________________________________________________________________
__________________
embedding_1 (Embedding)         (None, 600, 300)     15504000    input_1[0][0]
____________________________________________________________________________
__________________
embedding_2 (Embedding)         (None, 1, 10)        520         input_2[0][0]
____________________________________________________________________________
__________________
embedding_3 (Embedding)         (None, 1, 10)        50          input_3[0][0]
____________________________________________________________________________
__________________
embedding_4 (Embedding)         (None, 1, 10)        520         input_4[0][0]
____________________________________________________________________________
__________________
embedding_5 (Embedding)         (None, 1, 10)        3960        input_5[0][0]
____________________________________________________________________________
__________________
embedding_6 (Embedding)         (None, 1, 10)        60          input_6[0][0]
____________________________________________________________________________
__________________
input_7 (InputLayer)            (None, 2)            0
____________________________________________________________________________
__________________
lstm_1 (LSTM)                   (None, 32)           42624
embedding_1[0][0]
____________________________________________________________________________
__________________
flatten_1 (Flatten)             (None, 10)           0
embedding_2[0][0]
____________________________________________________________________________
__________________
flatten_2 (Flatten)             (None, 10)           0
embedding_3[0][0]
____________________________________________________________________________
__________________
flatten_3 (Flatten)             (None, 10)           0
embedding_4[0][0]
____________________________________________________________________________
__________________
flatten_4 (Flatten)             (None, 10)           0
embedding_5[0][0]
____________________________________________________________________________
```

```
------------------
flatten_5 (Flatten)             (None, 10)           0
embedding_6[0][0]
------------------------------------------------------------------------------
------------------
dense_1 (Dense)                 (None, 5)            15          input_7[0][0]
------------------------------------------------------------------------------
------------------
concatenate_1 (Concatenate)     (None, 87)           0           lstm_1[0][0]
                                                                 flatten_1[0][0]
                                                                 flatten_2[0][0]
                                                                 flatten_3[0][0]
                                                                 flatten_4[0][0]
                                                                 flatten_5[0][0]
                                                                 dense_1[0][0]
------------------------------------------------------------------------------
------------------
dense_2 (Dense)                 (None, 1024)         90112
concatenate_1[0][0]
------------------------------------------------------------------------------
------------------
dropout_1 (Dropout)             (None, 1024)         0           dense_2[0][0]
------------------------------------------------------------------------------
------------------
dense_3 (Dense)                 (None, 512)          524800      dropout_1[0][0]
------------------------------------------------------------------------------
------------------
dropout_2 (Dropout)             (None, 512)          0           dense_3[0][0]
------------------------------------------------------------------------------
------------------
dense_4 (Dense)                 (None, 128)          65664       dropout_2[0][0]
------------------------------------------------------------------------------
------------------
main_output (Dense)             (None, 1)            129         dense_4[0][0]
==============================================================================
==================
Total params: 16,232,454
Trainable params: 728,454
Non-trainable params: 15,504,000
------------------------------------------------------------------------------
------------------
None
```

[13]:
```
from time import time
from keras.callbacks import TensorBoard
tensorboard=TensorBoard(log_dir="logs\{}".format(time()))
```

[14]:
```
merged_model1.compile(optimizer='adam',␣
 ↪loss='binary_crossentropy',metrics=["accuracy",auc_roc])
```

```
W0901 23:53:11.960052  7292 deprecation_wrapper.py:119] From
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\keras\optimizers.py:790: The name tf.train.Optimizer is deprecated.
Please use tf.compat.v1.train.Optimizer instead.

W0901 23:53:12.004928  7292 deprecation.py:323] From
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\tensorflow\python\ops\nn_impl.py:180:
add_dispatch_support.<locals>.wrapper (from tensorflow.python.ops.array_ops) is
deprecated and will be removed in a future version.
Instructions for updating:
Use tf.where in 2.0, which has the same broadcast rule as np.where
W0901 23:53:12.025873  7292 deprecation.py:323] From <ipython-
input-2-cdb340bebd3a>:15: py_func (from tensorflow.python.ops.script_ops) is
deprecated and will be removed in a future version.
Instructions for updating:
tf.py_func is deprecated in TF V2. Instead, there are two
    options available in V2.
    - tf.py_function takes a python function which manipulates tf eager
    tensors instead of numpy arrays. It's easy to convert a tf eager tensor to
    an ndarray (just call tensor.numpy()) but having access to eager tensors
    means `tf.py_function`s can use accelerators such as GPUs as well as
    being differentiable using a gradient tape.
    - tf.numpy_function maintains the semantics of the deprecated tf.py_func
    (it is not differentiable, and manipulates numpy arrays). It drops the
    stateful argument making all functions stateful.
```

[15]:
```
import keras
from keras.callbacks import Callback
from sklearn.metrics import roc_auc_score
from keras.callbacks import ModelCheckpoint

filepath="weights-improvement-model1.hdf5"
checkpoint = ModelCheckpoint(filepath, verbose=1,monitor="val_auc_roc",␣
 ↪save_best_only=True, mode='max')
callbacks_list = [tensorboard,checkpoint]
```

[16]:
```
merged_model1.fit([padded_docs_text_train, encoded_docs_school_state_train,␣
 ↪encoded_docs_project_grade_category_train,␣
 ↪encoded_docs_clean_categories_train, encoded_docs_clean_subcategories_train,␣
 ↪encoded_docs_teacher_prefix_train,␣
 ↪X_train[['teacher_number_of_previously_posted_projects','price']].
 ↪as_matrix()], [y_train],epochs=30,␣
 ↪batch_size=1024,callbacks=callbacks_list,validation_split=0.2)
```

```
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\ipykernel_launcher.py:1: FutureWarning: Method .as_matrix will be
removed in a future version. Use .values instead.
  """Entry point for launching an IPython kernel.

Train on 69918 samples, validate on 17480 samples

W0901 23:53:14.185401  7292 deprecation_wrapper.py:119] From
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\keras\callbacks.py:850: The name tf.summary.merge_all is deprecated.
Please use tf.compat.v1.summary.merge_all instead.

W0901 23:53:14.185401  7292 deprecation_wrapper.py:119] From
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\keras\callbacks.py:853: The name tf.summary.FileWriter is deprecated.
Please use tf.compat.v1.summary.FileWriter instead.


Epoch 1/30
69918/69918 [==============================] - 65s 933us/step - loss: 1.0138 -
acc: 0.8047 - auc_roc: 0.4959 - val_loss: 0.4288 - val_acc: 0.8468 -
val_auc_roc: 0.5748

Epoch 00001: val_auc_roc improved from -inf to 0.57475, saving model to weights-
improvement-model1.hdf5
Epoch 2/30
69918/69918 [==============================] - 64s 921us/step - loss: 0.4473 -
acc: 0.8425 - auc_roc: 0.5571 - val_loss: 0.4211 - val_acc: 0.8468 -
val_auc_roc: 0.6181

Epoch 00002: val_auc_roc improved from 0.57475 to 0.61809, saving model to
weights-improvement-model1.hdf5
Epoch 3/30
69918/69918 [==============================] - 65s 923us/step - loss: 0.4184 -
acc: 0.8458 - auc_roc: 0.6348 - val_loss: 0.3983 - val_acc: 0.8468 -
val_auc_roc: 0.7120

Epoch 00003: val_auc_roc improved from 0.61809 to 0.71203, saving model to
weights-improvement-model1.hdf5
Epoch 4/30
69918/69918 [==============================] - 65s 926us/step - loss: 0.3953 -
acc: 0.8473 - auc_roc: 0.7015 - val_loss: 0.3834 - val_acc: 0.8468 -
val_auc_roc: 0.7311

Epoch 00004: val_auc_roc improved from 0.71203 to 0.73109, saving model to
weights-improvement-model1.hdf5
Epoch 5/30
69918/69918 [==============================] - 66s 951us/step - loss: 0.3868 -
```

```
acc: 0.8474 - auc_roc: 0.7207 - val_loss: 0.3783 - val_acc: 0.8476 -
val_auc_roc: 0.7482

Epoch 00005: val_auc_roc improved from 0.73109 to 0.74820, saving model to
weights-improvement-model1.hdf5
Epoch 6/30
69918/69918 [==============================] - 70s 1ms/step - loss: 0.3740 -
acc: 0.8492 - auc_roc: 0.7412 - val_loss: 0.3697 - val_acc: 0.8479 -
val_auc_roc: 0.7557

Epoch 00006: val_auc_roc improved from 0.74820 to 0.75570, saving model to
weights-improvement-model1.hdf5
Epoch 7/30
69918/69918 [==============================] - 70s 1ms/step - loss: 0.3684 -
acc: 0.8504 - auc_roc: 0.7542 - val_loss: 0.3805 - val_acc: 0.8486 -
val_auc_roc: 0.7544

Epoch 00007: val_auc_roc did not improve from 0.75570
Epoch 8/30
69918/69918 [==============================] - 70s 1ms/step - loss: 0.3668 -
acc: 0.8505 - auc_roc: 0.7575 - val_loss: 0.3668 - val_acc: 0.8513 -
val_auc_roc: 0.7593

Epoch 00008: val_auc_roc improved from 0.75570 to 0.75929, saving model to
weights-improvement-model1.hdf5
Epoch 9/30
69918/69918 [==============================] - 67s 959us/step - loss: 0.3617 -
acc: 0.8526 - auc_roc: 0.7677 - val_loss: 0.3658 - val_acc: 0.8534 -
val_auc_roc: 0.7620

Epoch 00009: val_auc_roc improved from 0.75929 to 0.76197, saving model to
weights-improvement-model1.hdf5
Epoch 10/30
69918/69918 [==============================] - 65s 925us/step - loss: 0.3588 -
acc: 0.8542 - auc_roc: 0.7712 - val_loss: 0.3650 - val_acc: 0.8516 -
val_auc_roc: 0.7627

Epoch 00010: val_auc_roc improved from 0.76197 to 0.76270, saving model to
weights-improvement-model1.hdf5
Epoch 11/30
69918/69918 [==============================] - 62s 893us/step - loss: 0.3540 -
acc: 0.8548 - auc_roc: 0.7789 - val_loss: 0.3667 - val_acc: 0.8496 -
val_auc_roc: 0.7620

Epoch 00011: val_auc_roc did not improve from 0.76270
Epoch 12/30
69918/69918 [==============================] - 63s 902us/step - loss: 0.3512 -
acc: 0.8575 - auc_roc: 0.7852 - val_loss: 0.3669 - val_acc: 0.8491 -
```

```
val_auc_roc: 0.7643

Epoch 00012: val_auc_roc improved from 0.76270 to 0.76428, saving model to
weights-improvement-model1.hdf5
Epoch 13/30
69918/69918 [==============================] - 65s 924us/step - loss: 0.3466 -
acc: 0.8587 - auc_roc: 0.7906 - val_loss: 0.3684 - val_acc: 0.8528 -
val_auc_roc: 0.7587

Epoch 00013: val_auc_roc did not improve from 0.76428
Epoch 14/30
69918/69918 [==============================] - 68s 974us/step - loss: 0.3429 -
acc: 0.8612 - auc_roc: 0.7956 - val_loss: 0.3651 - val_acc: 0.8534 -
val_auc_roc: 0.7625

Epoch 00014: val_auc_roc did not improve from 0.76428
Epoch 15/30
69918/69918 [==============================] - 66s 950us/step - loss: 0.3391 -
acc: 0.8627 - auc_roc: 0.8006 - val_loss: 0.3660 - val_acc: 0.8504 -
val_auc_roc: 0.7630

Epoch 00015: val_auc_roc did not improve from 0.76428
Epoch 16/30
69918/69918 [==============================] - 68s 970us/step - loss: 0.3370 -
acc: 0.8636 - auc_roc: 0.8045 - val_loss: 0.3717 - val_acc: 0.8463 -
val_auc_roc: 0.7609

Epoch 00016: val_auc_roc did not improve from 0.76428
Epoch 17/30
69918/69918 [==============================] - 74s 1ms/step - loss: 0.3329 -
acc: 0.8657 - auc_roc: 0.8106 - val_loss: 0.3745 - val_acc: 0.8474 -
val_auc_roc: 0.7582

Epoch 00017: val_auc_roc did not improve from 0.76428
Epoch 18/30
69918/69918 [==============================] - 70s 1ms/step - loss: 0.3290 -
acc: 0.8678 - auc_roc: 0.8154 - val_loss: 0.3704 - val_acc: 0.8501 -
val_auc_roc: 0.7565

Epoch 00018: val_auc_roc did not improve from 0.76428
Epoch 19/30
69918/69918 [==============================] - 69s 987us/step - loss: 0.3248 -
acc: 0.8708 - auc_roc: 0.8195 - val_loss: 0.3716 - val_acc: 0.8439 -
val_auc_roc: 0.7569

Epoch 00019: val_auc_roc did not improve from 0.76428
Epoch 20/30
69918/69918 [==============================] - 63s 894us/step - loss: 0.3212 -
```

```
acc: 0.8723 - auc_roc: 0.8235 - val_loss: 0.3754 - val_acc: 0.8420 -
val_auc_roc: 0.7554

Epoch 00020: val_auc_roc did not improve from 0.76428
Epoch 21/30
69918/69918 [==============================] - 69s 981us/step - loss: 0.3181 -
acc: 0.8751 - auc_roc: 0.8284 - val_loss: 0.3807 - val_acc: 0.8444 -
val_auc_roc: 0.7540

Epoch 00021: val_auc_roc did not improve from 0.76428
Epoch 22/30
69918/69918 [==============================] - 67s 962us/step - loss: 0.3121 -
acc: 0.8793 - auc_roc: 0.8333 - val_loss: 0.3774 - val_acc: 0.8410 -
val_auc_roc: 0.7535

Epoch 00022: val_auc_roc did not improve from 0.76428
Epoch 23/30
69918/69918 [==============================] - 67s 952us/step - loss: 0.3078 -
acc: 0.8817 - auc_roc: 0.8378 - val_loss: 0.3810 - val_acc: 0.8412 -
val_auc_roc: 0.7475

Epoch 00023: val_auc_roc did not improve from 0.76428
Epoch 24/30
69918/69918 [==============================] - 70s 1ms/step - loss: 0.3060 -
acc: 0.8833 - auc_roc: 0.8410 - val_loss: 0.3914 - val_acc: 0.8435 -
val_auc_roc: 0.7495

Epoch 00024: val_auc_roc did not improve from 0.76428
Epoch 25/30
69918/69918 [==============================] - 67s 964us/step - loss: 0.3018 -
acc: 0.8854 - auc_roc: 0.8452 - val_loss: 0.3915 - val_acc: 0.8301 -
val_auc_roc: 0.7489

Epoch 00025: val_auc_roc did not improve from 0.76428
Epoch 26/30
69918/69918 [==============================] - 67s 961us/step - loss: 0.2985 -
acc: 0.8875 - auc_roc: 0.8481 - val_loss: 0.3962 - val_acc: 0.8231 -
val_auc_roc: 0.7456

Epoch 00026: val_auc_roc did not improve from 0.76428
Epoch 27/30
69918/69918 [==============================] - 72s 1ms/step - loss: 0.2932 -
acc: 0.8906 - auc_roc: 0.8536 - val_loss: 0.3988 - val_acc: 0.8394 -
val_auc_roc: 0.7401

Epoch 00027: val_auc_roc did not improve from 0.76428
Epoch 28/30
69918/69918 [==============================] - 73s 1ms/step - loss: 0.2880 -
```

```
acc: 0.8942 - auc_roc: 0.8566 - val_loss: 0.3979 - val_acc: 0.8256 -
val_auc_roc: 0.7357

Epoch 00028: val_auc_roc did not improve from 0.76428
Epoch 29/30
69918/69918 [==============================] - 69s 991us/step - loss: 0.2867 -
acc: 0.8943 - auc_roc: 0.8593 - val_loss: 0.3999 - val_acc: 0.8295 -
val_auc_roc: 0.7363

Epoch 00029: val_auc_roc did not improve from 0.76428
Epoch 30/30
69918/69918 [==============================] - 59s 851us/step - loss: 0.2835 -
acc: 0.8962 - auc_roc: 0.8635 - val_loss: 0.3933 - val_acc: 0.8342 -
val_auc_roc: 0.7334

Epoch 00030: val_auc_roc did not improve from 0.76428
```

[16]:
```
<keras.callbacks.History at 0x1e191d73400>
```

[17]:
```
merged_model1 = load_model('weights-improvement-model1.hdf5',␣
↪custom_objects={'auc_roc': auc_roc})
```

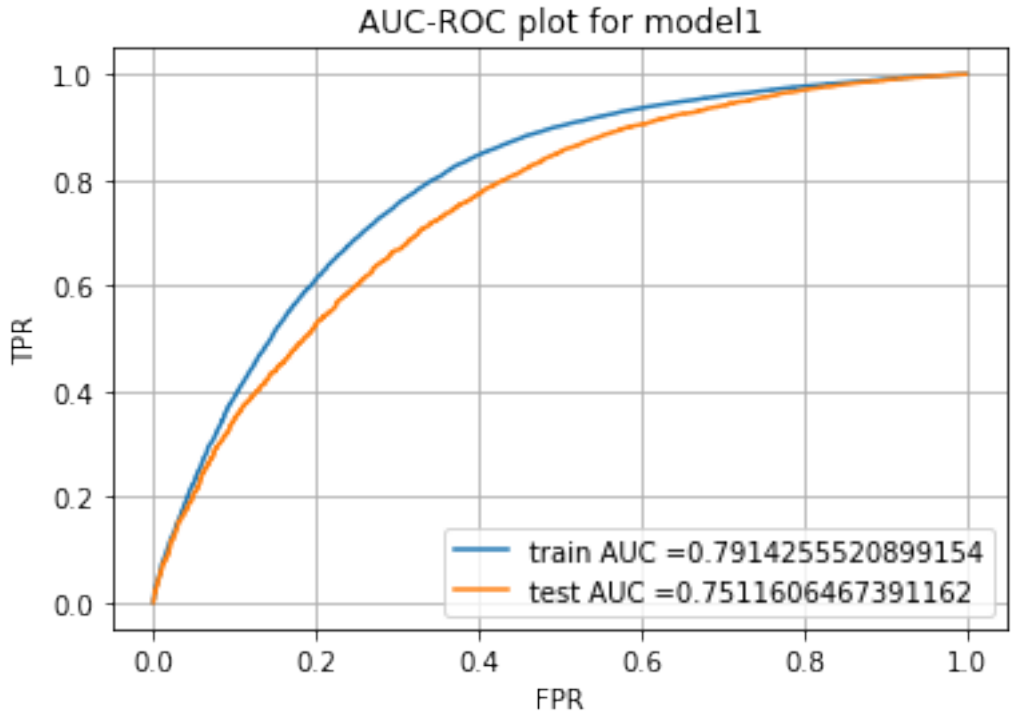
[18]:
```
result1_test = merged_model1.predict(x=[padded_docs_text_test,␣
↪encoded_docs_school_state_test, encoded_docs_project_grade_category_test,␣
↪encoded_docs_clean_categories_test, encoded_docs_clean_subcategories_test,␣
↪encoded_docs_teacher_prefix_test,␣
↪X_test[['teacher_number_of_previously_posted_projects','price']].
↪as_matrix()])
```

```
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\ipykernel_launcher.py:1: FutureWarning: Method .as_matrix will be
removed in a future version. Use .values instead.
  """Entry point for launching an IPython kernel.
```

[19]:
```
result1_train = merged_model1.predict(x=[padded_docs_text_train,␣
↪encoded_docs_school_state_train, encoded_docs_project_grade_category_train,␣
↪encoded_docs_clean_categories_train, encoded_docs_clean_subcategories_train,␣
↪encoded_docs_teacher_prefix_train,␣
↪X_train[['teacher_number_of_previously_posted_projects','price']].
↪as_matrix()])
```

```
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\ipykernel_launcher.py:1: FutureWarning: Method .as_matrix will be
removed in a future version. Use .values instead.
  """Entry point for launching an IPython kernel.
```

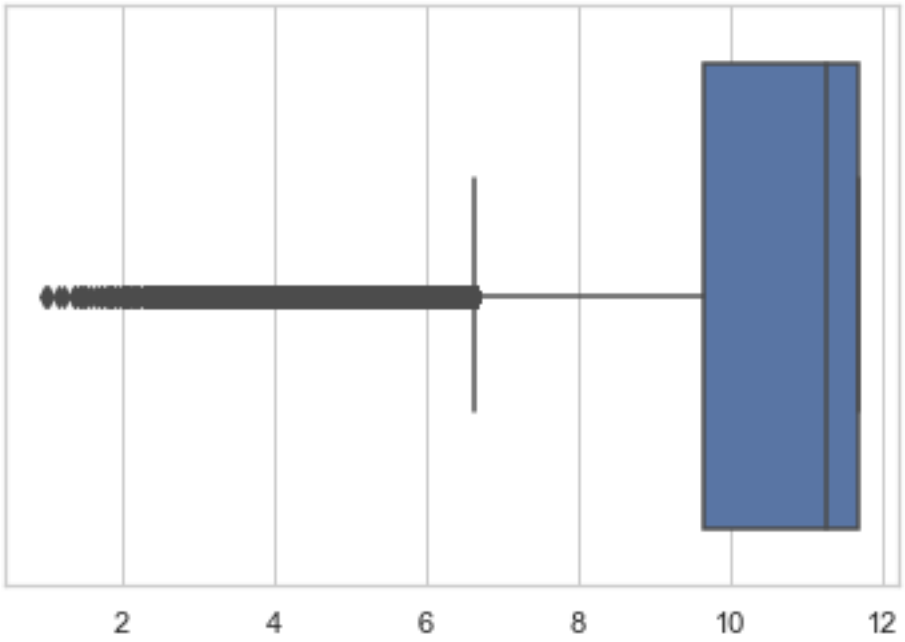
[20]:
```
# https://scikit-learn.org/stable/modules/generated/sklearn.metrics.roc_curve.
 ↪html#sklearn.metrics.roc_curve
import matplotlib.pyplot as plt
from sklearn.metrics import roc_curve, auc

train_fpr, train_tpr, tr_thresholds = roc_curve(y_train, result1_train)
test_fpr, test_tpr, te_thresholds = roc_curve(y_test, result1_test)

plt.plot(train_fpr, train_tpr, label="train AUC ="+str(auc(train_fpr,␣
 ↪train_tpr)))
plt.plot(test_fpr, test_tpr, label="test AUC ="+str(auc(test_fpr, test_tpr)))
plt.legend()
plt.xlabel("FPR")
plt.ylabel("TPR")
plt.title("AUC-ROC plot for model1")
plt.grid()
plt.show()
```



3 Model2

[21]:
```
from sklearn.feature_extraction.text import TfidfVectorizer
tfidf_model = TfidfVectorizer()
tfidf_model.fit(X_train.essay.values)
# we are converting a dictionary with word as a key, and the idf as a value
dictionary = dict(zip(tfidf_model.get_feature_names(), list(tfidf_model.idf_)))
essay_tfidf_words = set(tfidf_model.get_feature_names())
```

[22]:
```
import seaborn as sns
import matplotlib.pyplot as plt
sns.set(style="whitegrid")
ax = sns.boxplot(x=list(tfidf_model.idf_))
plt.show()
```



I have decoded to take tf-idf 2.0 to 11.2

[23]:
```
from tqdm import tqdm
filtered_via_tfidf_train = [];
for sentence in tqdm(X_train.essay.values): # for each review/sentence
#     print(sentence)
#     print("**************************")
    temp=''
    for word in sentence.split(): # for each word in a review/sentence
        if word in essay_tfidf_words and dictionary[word]>=2.0 and␣
↪dictionary[word]<=11.0:
            temp+=word
            temp+=' '
```

```
        else:
            pass
    #print(temp)
#     print("**************************")
    filtered_via_tfidf_train.append(temp)
```

```
100%||
87398/87398 [00:14<00:00, 6028.53it/s]
```

[24]:
```
print(dictionary['considerations'])
print(X_train.essay.values[1007])
print("**************************")
print(filtered_via_tfidf_train[1007])
```

```
9.605650397690793
my students walk classroom every day full life ready learn excited store day i
want know i believe anything they like move love read love lots positive
attention from minute walk door classroom i focus potential growth i may not
able control home lives however i certainly control experience school day by
creative positive way i hopeful inspire even earliest learners continue path
academic excellence i want set classroom encourages choice empowerment children
my classroom based mainly around language arts math science social studies 3rd
grade setting we many group projects discussions experiments research also
independent learning i 28 students class currently ethnic backgrounds also
diverse socio economic landscape with nationwide push giving students choice
classroom personal control learning not giving consideration seating think
learned best school was sitting rigid desk chair stretched across bed belly
maybe propped pillows even standing i love idea giving students freedom choose
want sit classroom with flexible seating students controlled choice style
seating want work students choice sit yoga balls stand high table using balance
boards sit stools lay yoga mats sit wiggle cushions around low table even sit
traditional desk chairs i excited breakaway traditional classroom different
seating options available kids i looking forward challenge learning curve come
flexible seating nannan
**************************
walk every full life ready excited store want know believe anything like move
read lots positive attention from minute walk door focus potential growth may
control home lives however certainly control experience by creative positive way
hopeful inspire even earliest learners continue path academic excellence want
set encourages choice empowerment children based mainly around language arts
math science social studies 3rd grade setting group projects discussions
experiments research independent 28 currently ethnic backgrounds diverse socio
economic landscape with nationwide push giving choice personal control giving
consideration seating think learned best was sitting rigid desk chair stretched
across bed belly maybe propped pillows even standing idea giving freedom choose
want sit with flexible seating controlled choice style seating want choice sit
yoga balls stand high table using balance boards sit stools lay yoga mats sit
```

```
wiggle cushions around low table even sit traditional desk chairs excited
traditional different seating options available kids looking forward challenge
curve flexible seating
```

[25]:
```
X_train_copy=X_train
X_test_copy=X_test
print(X_train.essay.loc[0])
X_train.essay=filtered_via_tfidf_train
print(X_train.essay.loc[0])
```

```
i fortunate enough use fairy tale stem kits classroom well stem journals
students really enjoyed i would love implement lakeshore stem kits classroom
next school year provide excellent engaging stem lessons my students come
variety backgrounds including language socioeconomic status many not lot
experience science engineering kits give materials provide exciting
opportunities students each month i try several science stem steam projects i
would use kits robot help guide science instruction engaging meaningful ways i
adapt kits current language arts pacing guide already teach material kits like
tall tales paul bunyan johnny appleseed the following units taught next school
year i implement kits magnets motion sink vs float robots i often get units not
know if i teaching right way using right materials the kits give additional
ideas strategies lessons prepare students science it challenging develop high
quality science activities these kits give materials i need provide students
science activities go along curriculum classroom although i things like magnets
classroom i not know use effectively the kits provide right amount materials
show use appropriate way
```

```
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\pandas\core\generic.py:5208: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: http://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  self[name] = value
```

```
fortunate enough fairy tale stem kits well stem journals really enjoyed would
implement lakeshore stem kits next year provide excellent engaging stem lessons
variety backgrounds including language socioeconomic status lot experience
science engineering kits give materials provide exciting opportunities each
month try several science stem steam projects would kits robot guide science
instruction engaging meaningful ways adapt kits current language arts pacing
guide already teach material kits like tall tales paul bunyan johnny appleseed
following units taught next year implement kits magnets motion sink vs float
robots often get units know if teaching right way using right materials kits
give additional ideas strategies lessons prepare science it challenging develop
high quality science activities these kits give materials provide science
activities go along curriculum although things like magnets know effectively
kits provide right amount materials show appropriate way
```

[26]:
```
# https://machinelearningmastery.com/
 ↪use-word-embedding-layers-deep-learning-keras/

from keras.preprocessing.sequence import pad_sequences
from keras.preprocessing.text import Tokenizer
import numpy as np
# prepare tokenizer
t = Tokenizer()
t.fit_on_texts(X_train.essay)
vocab_size = len(t.word_index) + 1
# integer encode the documents
encoded_docs_text_train = t.texts_to_sequences(X_train.essay)
#print(encoded_docs)
# pad documents to a max length of 4 words
max_length = 600
padded_docs_text_train = pad_sequences(encoded_docs_text_train,␣
 ↪maxlen=max_length, padding='pre')
#print(padded_docs[0])
print(len(padded_docs_text_train))
print(len(padded_docs_text_train[0]))

# load the whole embedding into memory
embeddings_index = dict()
f = open('glove.42B.300d.txt', 'r', encoding="utf8")
for line in f:
    values = line.split()
    word = values[0]
    coefs = np.asarray(values[1:], dtype='float32')
    embeddings_index[word] = coefs
f.close()
print('Loaded %s word vectors.' % len(embeddings_index))
# create a weight matrix for words in training docs
embedding_matrix = np.zeros((vocab_size, 300))
for word, i in t.word_index.items():
    embedding_vector = embeddings_index.get(word)
    if embedding_vector is not None:
        embedding_matrix[i] = embedding_vector
```

```
87398
600
Loaded 1917495 word vectors.
```

[27]:
```
encoded_docs_text_test = t.texts_to_sequences(X_test.essay)
#print(encoded_docs)
# pad documents to a max length of 4 words
max_length = 600
```

```
padded_docs_text_test = pad_sequences(encoded_docs_text_test,␣
 ↪maxlen=max_length, padding='pre')
#print(padded_docs[0])
print(len(padded_docs_text_train))
print(len(padded_docs_text_train[0]))
```

```
87398
600
```

[28]:
```
from keras.layers import Input, Embedding, LSTM, Dense, concatenate, Flatten
from keras.models import Model
first_input = Input(shape=(600,))
e = Embedding(vocab_size, 300, weights=[embedding_matrix], input_length=600,␣
 ↪trainable=False)(first_input)
lstm_out=LSTM(32)(e)
```

[29]:
```
encoded_docs_school_state_train = dfToTokenize(X_train.school_state,X_train.
 ↪school_state.unique().tolist())
encoded_docs_school_state_test = dfToTokenize(X_test.school_state,X_train.
 ↪school_state.unique().tolist())


encoded_docs_project_grade_category_train = dfToTokenize(X_train.
 ↪project_grade_category,X_train.project_grade_category.unique().tolist())
encoded_docs_project_grade_category_test = dfToTokenize(X_test.
 ↪project_grade_category,X_train.project_grade_category.unique().tolist())


encoded_docs_clean_categories_train = dfToTokenize(X_train.
 ↪clean_categories,X_train.clean_categories.unique().tolist())
encoded_docs_clean_categories_test = dfToTokenize(X_test.
 ↪clean_categories,X_train.clean_categories.unique().tolist())


encoded_docs_clean_subcategories_train = dfToTokenize(X_train.
 ↪clean_subcategories,X_train.clean_subcategories.unique().tolist())
encoded_docs_clean_subcategories_test = dfToTokenize(X_test.
 ↪clean_subcategories,X_train.clean_subcategories.unique().tolist())

encoded_docs_teacher_prefix_train = dfToTokenize(X_train.teacher_prefix,X_train.
 ↪teacher_prefix.unique().tolist())
encoded_docs_teacher_prefix_test = dfToTokenize(X_test.teacher_prefix,X_train.
 ↪teacher_prefix.unique().tolist())
```

[30]:
```
from keras.layers.merge import concatenate
from keras.models import Model, Sequential
from keras.layers import Dense, Input, Dropout
```

```
vocab_size1 = len(X_train.school_state.unique().tolist()) + 1
model1_in = Input(shape=(encoded_docs_school_state_train.shape[1],))
x = Embedding(vocab_size1 ,10,input_shape=(vocab_size1,))(model1_in)
model1_out = Flatten()(x)
model1 = Model(model1_in, model1_out)


vocab_size2 = len(X_train.project_grade_category.unique().tolist()) + 1
model2_in = Input(shape=(encoded_docs_project_grade_category_train.shape[1],))
y = Embedding(vocab_size2 ,10,input_shape=(vocab_size2,))(model2_in)
model2_out = Flatten()(y)
model2 = Model(model2_in, model2_out)


vocab_size3 = len(X_train.clean_categories.unique().tolist()) + 1
model3_in = Input(shape=(encoded_docs_clean_categories_train.shape[1],))
y = Embedding(vocab_size3 ,10,input_shape=(vocab_size3,))(model3_in)
model3_out = Flatten()(y)
model3 = Model(model3_in, model3_out)


vocab_size4 = len(X_train.clean_subcategories.unique().tolist()) + 1
model4_in = Input(shape=(encoded_docs_clean_subcategories_train.shape[1],))
y = Embedding(vocab_size4 ,10,input_shape=(vocab_size4,))(model4_in)
model4_out = Flatten()(y)
model4 = Model(model4_in, model4_out)


vocab_size5 = len(X_train.teacher_prefix.unique().tolist()) + 1
model5_in = Input(shape=(encoded_docs_teacher_prefix_train.shape[1],))
y = Embedding(vocab_size5 ,10,input_shape=(vocab_size5,))(model5_in)
model5_out = Flatten()(y)
model5 = Model(model5_in, model5_out)


model6_in = Input(shape=(2,))
model6_out = Dense(5, activation='relu')(model6_in)
```

[31]:
```
concatenated = concatenate([lstm_out, model1_out, model2_out, model3_out,␣
↪model4_out, model5_out, model6_out])
intermediate_out = Dense(1024, activation='relu')(concatenated)
out=Dropout(0.3)(intermediate_out)
out=Dense(512, activation='relu')(out)
out=Dropout(0.3)(out)
out=Dense(128, activation='relu')(out)
```

```
out=Dense(1, activation='sigmoid', name='main_output')(out)

merged_model2 = Model(inputs= [first_input,model1_in, model2_in, model3_in,␣
 ↪model4_in, model5_in, model6_in], outputs=[out])
print(merged_model2.summary())
```

```
__________________________________________________________________________________
__________________
Layer (type)                    Output Shape         Param #     Connected to
==================================================================================
==================
input_8 (InputLayer)            (None, 600)          0
__________________________________________________________________________________
__________________
input_9 (InputLayer)            (None, 1)            0
__________________________________________________________________________________
__________________
input_10 (InputLayer)           (None, 1)            0
__________________________________________________________________________________
__________________
input_11 (InputLayer)           (None, 1)            0
__________________________________________________________________________________
__________________
input_12 (InputLayer)           (None, 1)            0
__________________________________________________________________________________
__________________
input_13 (InputLayer)           (None, 1)            0
__________________________________________________________________________________
__________________
embedding_7 (Embedding)         (None, 600, 300)     7658100     input_8[0][0]
__________________________________________________________________________________
__________________
embedding_8 (Embedding)         (None, 1, 10)        520         input_9[0][0]
__________________________________________________________________________________
__________________
embedding_9 (Embedding)         (None, 1, 10)        50          input_10[0][0]
__________________________________________________________________________________
__________________
embedding_10 (Embedding)        (None, 1, 10)        520         input_11[0][0]
__________________________________________________________________________________
__________________
embedding_11 (Embedding)        (None, 1, 10)        3960        input_12[0][0]
__________________________________________________________________________________
__________________
embedding_12 (Embedding)        (None, 1, 10)        60          input_13[0][0]
__________________________________________________________________________________
__________________
```

```
input_14 (InputLayer)           (None, 2)            0
__________________________________________________________________________________________
__________________
lstm_2 (LSTM)                   (None, 32)           42624
embedding_7[0][0]
__________________________________________________________________________________________
__________________
flatten_6 (Flatten)             (None, 10)           0
embedding_8[0][0]
__________________________________________________________________________________________
__________________
flatten_7 (Flatten)             (None, 10)           0
embedding_9[0][0]
__________________________________________________________________________________________
__________________
flatten_8 (Flatten)             (None, 10)           0
embedding_10[0][0]
__________________________________________________________________________________________
__________________
flatten_9 (Flatten)             (None, 10)           0
embedding_11[0][0]
__________________________________________________________________________________________
__________________
flatten_10 (Flatten)            (None, 10)           0
embedding_12[0][0]
__________________________________________________________________________________________
__________________
dense_5 (Dense)                 (None, 5)            15          input_14[0][0]
__________________________________________________________________________________________
__________________
concatenate_2 (Concatenate)     (None, 87)           0           lstm_2[0][0]
                                                                 flatten_6[0][0]
                                                                 flatten_7[0][0]
                                                                 flatten_8[0][0]
                                                                 flatten_9[0][0]
flatten_10[0][0]
                                                                 dense_5[0][0]
__________________________________________________________________________________________
__________________
dense_6 (Dense)                 (None, 1024)         90112
concatenate_2[0][0]
__________________________________________________________________________________________
__________________
dropout_3 (Dropout)             (None, 1024)         0           dense_6[0][0]
__________________________________________________________________________________________
__________________
dense_7 (Dense)                 (None, 512)          524800      dropout_3[0][0]
__________________________________________________________________________________________
```

```
------------------
dropout_4 (Dropout)             (None, 512)          0           dense_7[0][0]
------------------------------------------------------------------------------
------------------
dense_8 (Dense)                 (None, 128)          65664       dropout_4[0][0]
------------------------------------------------------------------------------
------------------
main_output (Dense)             (None, 1)            129         dense_8[0][0]
==============================================================================
==================
Total params: 8,386,554
Trainable params: 728,454
Non-trainable params: 7,658,100
------------------------------------------------------------------------------
------------------
None
```

[32]:
```
from time import time
from keras.callbacks import TensorBoard
tensorboard=TensorBoard(log_dir="logs\{}".format(time()))
```

[33]:
```
import keras
merged_model2.compile(optimizer=keras.optimizers.Adam(lr=0.0001),␣
 ↪loss='binary_crossentropy',metrics=["accuracy",auc_roc])
```

[34]:
```
from keras.callbacks import ModelCheckpoint
filepath="weights-improvement-model2.hdf5"
checkpoint = ModelCheckpoint(filepath, verbose=1,monitor="val_auc_roc",␣
 ↪save_best_only=True, mode='max')
callbacks_list = [tensorboard,checkpoint]
```

[35]:
```
merged_model2.fit([padded_docs_text_train, encoded_docs_school_state_train,␣
 ↪encoded_docs_project_grade_category_train,␣
 ↪encoded_docs_clean_categories_train, encoded_docs_clean_subcategories_train,␣
 ↪encoded_docs_teacher_prefix_train,␣
 ↪X_train[['teacher_number_of_previously_posted_projects','price']].
 ↪as_matrix()], [y_train],epochs=30,␣
 ↪batch_size=1024,callbacks=callbacks_list,validation_split=0.2)
```

```
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\ipykernel_launcher.py:1: FutureWarning: Method .as_matrix will be
removed in a future version. Use .values instead.
  """Entry point for launching an IPython kernel.

Train on 69918 samples, validate on 17480 samples
Epoch 1/30
69918/69918 [==============================] - ETA: 2:35 - loss: 1.6922 - acc:
0.4736 - auc_roc: 0.514 - ETA: 1:50 - loss: 1.4713 - acc: 0.5898 - auc_roc:
0.480 - ETA: 1:34 - loss: 1.3334 - acc: 0.6628 - auc_roc: 0.475 - ETA: 1:25 -
```

```
loss: 1.2802 - acc: 0.7068 - auc_roc: 0.467 - ETA: 1:19 - loss: 1.2583 - acc:
0.7344 - auc_roc: 0.462 - ETA: 1:15 - loss: 1.2703 - acc: 0.7503 - auc_roc:
0.454 - ETA: 1:14 - loss: 1.2589 - acc: 0.7616 - auc_roc: 0.455 - ETA: 1:11 -
loss: 1.2285 - acc: 0.7744 - auc_roc: 0.453 - ETA: 1:10 - loss: 1.2216 - acc:
0.7795 - auc_roc: 0.448 - ETA: 1:09 - loss: 1.2132 - acc: 0.7840 - auc_roc:
0.442 - ETA: 1:07 - loss: 1.1953 - acc: 0.7844 - auc_roc: 0.442 - ETA: 1:07 -
loss: 1.1923 - acc: 0.7808 - auc_roc: 0.443 - ETA: 1:06 - loss: 1.1776 - acc:
0.7762 - auc_roc: 0.445 - ETA: 1:04 - loss: 1.1671 - acc: 0.7697 - auc_roc:
0.450 - ETA: 1:02 - loss: 1.1628 - acc: 0.7622 - auc_roc: 0.450 - ETA: 1:00 -
loss: 1.1573 - acc: 0.7552 - auc_roc: 0.451 - ETA: 58s - loss: 1.1453 - acc:
0.7525 - auc_roc: 0.453 - ETA: 57s - loss: 1.1308 - acc: 0.7521 - auc_roc: 0.45
- ETA: 55s - loss: 1.1203 - acc: 0.7527 - auc_roc: 0.45 - ETA: 53s - loss:
1.1118 - acc: 0.7545 - auc_roc: 0.45 - ETA: 52s - loss: 1.0998 - acc: 0.7578 -
auc_roc: 0.45 - ETA: 50s - loss: 1.0882 - acc: 0.7605 - auc_roc: 0.45 - ETA: 49s
- loss: 1.0777 - acc: 0.7635 - auc_roc: 0.45 - ETA: 47s - loss: 1.0672 - acc:
0.7664 - auc_roc: 0.45 - ETA: 46s - loss: 1.0631 - acc: 0.7679 - auc_roc: 0.45 -
ETA: 44s - loss: 1.0559 - acc: 0.7698 - auc_roc: 0.45 - ETA: 43s - loss: 1.0444
- acc: 0.7719 - auc_roc: 0.45 - ETA: 42s - loss: 1.0384 - acc: 0.7726 - auc_roc:
0.45 - ETA: 40s - loss: 1.0290 - acc: 0.7735 - auc_roc: 0.45 - ETA: 39s - loss:
1.0258 - acc: 0.7724 - auc_roc: 0.45 - ETA: 38s - loss: 1.0200 - acc: 0.7717 -
auc_roc: 0.45 - ETA: 36s - loss: 1.0134 - acc: 0.7713 - auc_roc: 0.45 - ETA: 35s
- loss: 1.0067 - acc: 0.7706 - auc_roc: 0.45 - ETA: 34s - loss: 1.0007 - acc:
0.7706 - auc_roc: 0.45 - ETA: 33s - loss: 0.9924 - acc: 0.7704 - auc_roc: 0.45 -
ETA: 32s - loss: 0.9850 - acc: 0.7708 - auc_roc: 0.45 - ETA: 30s - loss: 0.9782
- acc: 0.7712 - auc_roc: 0.45 - ETA: 29s - loss: 0.9736 - acc: 0.7725 - auc_roc:
0.45 - ETA: 28s - loss: 0.9703 - acc: 0.7731 - auc_roc: 0.45 - ETA: 27s - loss:
0.9651 - acc: 0.7738 - auc_roc: 0.45 - ETA: 26s - loss: 0.9586 - acc: 0.7753 -
auc_roc: 0.45 - ETA: 25s - loss: 0.9535 - acc: 0.7758 - auc_roc: 0.45 - ETA: 24s
- loss: 0.9494 - acc: 0.7764 - auc_roc: 0.45 - ETA: 23s - loss: 0.9447 - acc:
0.7766 - auc_roc: 0.45 - ETA: 22s - loss: 0.9403 - acc: 0.7770 - auc_roc: 0.45 -
ETA: 21s - loss: 0.9359 - acc: 0.7768 - auc_roc: 0.45 - ETA: 20s - loss: 0.9318
- acc: 0.7766 - auc_roc: 0.45 - ETA: 19s - loss: 0.9275 - acc: 0.7762 - auc_roc:
0.45 - ETA: 18s - loss: 0.9224 - acc: 0.7759 - auc_roc: 0.45 - ETA: 17s - loss:
0.9178 - acc: 0.7758 - auc_roc: 0.45 - ETA: 16s - loss: 0.9137 - acc: 0.7761 -
auc_roc: 0.45 - ETA: 15s - loss: 0.9097 - acc: 0.7765 - auc_roc: 0.45 - ETA: 14s
- loss: 0.9039 - acc: 0.7770 - auc_roc: 0.45 - ETA: 13s - loss: 0.9005 - acc:
0.7775 - auc_roc: 0.45 - ETA: 12s - loss: 0.8984 - acc: 0.7777 - auc_roc: 0.45 -
ETA: 11s - loss: 0.8951 - acc: 0.7782 - auc_roc: 0.45 - ETA: 10s - loss: 0.8911
- acc: 0.7786 - auc_roc: 0.45 - ETA: 9s - loss: 0.8869 - acc: 0.7797 - auc_roc:
0.4562 - ETA: 8s - loss: 0.8845 - acc: 0.7801 - auc_roc: 0.455 - ETA: 7s - loss:
0.8812 - acc: 0.7805 - auc_roc: 0.455 - ETA: 6s - loss: 0.8784 - acc: 0.7807 -
auc_roc: 0.455 - ETA: 5s - loss: 0.8750 - acc: 0.7810 - auc_roc: 0.455 - ETA: 4s
- loss: 0.8710 - acc: 0.7808 - auc_roc: 0.456 - ETA: 3s - loss: 0.8674 - acc:
0.7808 - auc_roc: 0.456 - ETA: 2s - loss: 0.8649 - acc: 0.7808 - auc_roc: 0.456
- ETA: 2s - loss: 0.8613 - acc: 0.7809 - auc_roc: 0.456 - ETA: 1s - loss: 0.8583
- acc: 0.7811 - auc_roc: 0.456 - ETA: 0s - loss: 0.8561 - acc: 0.7811 - auc_roc:
0.457 - 68s 977us/step - loss: 0.8553 - acc: 0.7812 - auc_roc: 0.4571 -
val_loss: 0.5366 - val_acc: 0.8468 - val_auc_roc: 0.4435
```

```
Epoch 00001: val_auc_roc improved from -inf to 0.44346, saving model to weights-
improvement-model2.hdf5
Epoch 2/30
69918/69918 [==============================] - ETA: 52s - loss: 0.6416 - acc:
0.8145 - auc_roc: 0.43 - ETA: 52s - loss: 0.6720 - acc: 0.8018 - auc_roc: 0.45 -
ETA: 52s - loss: 0.6489 - acc: 0.8102 - auc_roc: 0.47 - ETA: 51s - loss: 0.6529
- acc: 0.8120 - auc_roc: 0.46 - ETA: 50s - loss: 0.6389 - acc: 0.8170 - auc_roc:
0.46 - ETA: 50s - loss: 0.6426 - acc: 0.8190 - auc_roc: 0.46 - ETA: 49s - loss:
0.6467 - acc: 0.8172 - auc_roc: 0.45 - ETA: 48s - loss: 0.6497 - acc: 0.8159 -
auc_roc: 0.45 - ETA: 47s - loss: 0.6491 - acc: 0.8156 - auc_roc: 0.45 - ETA: 47s
- loss: 0.6522 - acc: 0.8129 - auc_roc: 0.45 - ETA: 46s - loss: 0.6536 - acc:
0.8103 - auc_roc: 0.45 - ETA: 45s - loss: 0.6535 - acc: 0.8099 - auc_roc: 0.45 -
ETA: 44s - loss: 0.6514 - acc: 0.8098 - auc_roc: 0.45 - ETA: 43s - loss: 0.6489
- acc: 0.8088 - auc_roc: 0.45 - ETA: 42s - loss: 0.6468 - acc: 0.8079 - auc_roc:
0.45 - ETA: 42s - loss: 0.6471 - acc: 0.8072 - auc_roc: 0.45 - ETA: 41s - loss:
0.6445 - acc: 0.8074 - auc_roc: 0.45 - ETA: 40s - loss: 0.6420 - acc: 0.8078 -
auc_roc: 0.45 - ETA: 39s - loss: 0.6388 - acc: 0.8090 - auc_roc: 0.45 - ETA: 38s
- loss: 0.6356 - acc: 0.8102 - auc_roc: 0.45 - ETA: 37s - loss: 0.6342 - acc:
0.8109 - auc_roc: 0.46 - ETA: 36s - loss: 0.6340 - acc: 0.8116 - auc_roc: 0.45 -
ETA: 36s - loss: 0.6336 - acc: 0.8123 - auc_roc: 0.45 - ETA: 35s - loss: 0.6306
- acc: 0.8127 - auc_roc: 0.45 - ETA: 34s - loss: 0.6289 - acc: 0.8131 - auc_roc:
0.45 - ETA: 33s - loss: 0.6280 - acc: 0.8137 - auc_roc: 0.45 - ETA: 32s - loss:
0.6264 - acc: 0.8141 - auc_roc: 0.46 - ETA: 32s - loss: 0.6248 - acc: 0.8143 -
auc_roc: 0.46 - ETA: 31s - loss: 0.6258 - acc: 0.8136 - auc_roc: 0.46 - ETA: 30s
- loss: 0.6270 - acc: 0.8133 - auc_roc: 0.46 - ETA: 29s - loss: 0.6264 - acc:
0.8130 - auc_roc: 0.46 - ETA: 28s - loss: 0.6251 - acc: 0.8128 - auc_roc: 0.46 -
ETA: 28s - loss: 0.6248 - acc: 0.8127 - auc_roc: 0.46 - ETA: 27s - loss: 0.6246
- acc: 0.8128 - auc_roc: 0.46 - ETA: 26s - loss: 0.6243 - acc: 0.8127 - auc_roc:
0.46 - ETA: 25s - loss: 0.6224 - acc: 0.8130 - auc_roc: 0.46 - ETA: 24s - loss:
0.6203 - acc: 0.8134 - auc_roc: 0.46 - ETA: 24s - loss: 0.6178 - acc: 0.8139 -
auc_roc: 0.46 - ETA: 23s - loss: 0.6162 - acc: 0.8141 - auc_roc: 0.46 - ETA: 22s
- loss: 0.6153 - acc: 0.8145 - auc_roc: 0.46 - ETA: 21s - loss: 0.6146 - acc:
0.8145 - auc_roc: 0.46 - ETA: 20s - loss: 0.6136 - acc: 0.8146 - auc_roc: 0.46 -
ETA: 19s - loss: 0.6134 - acc: 0.8147 - auc_roc: 0.46 - ETA: 19s - loss: 0.6126
- acc: 0.8149 - auc_roc: 0.46 - ETA: 18s - loss: 0.6117 - acc: 0.8152 - auc_roc:
0.46 - ETA: 17s - loss: 0.6101 - acc: 0.8155 - auc_roc: 0.46 - ETA: 16s - loss:
0.6093 - acc: 0.8153 - auc_roc: 0.47 - ETA: 15s - loss: 0.6085 - acc: 0.8156 -
auc_roc: 0.46 - ETA: 15s - loss: 0.6070 - acc: 0.8161 - auc_roc: 0.47 - ETA: 14s
- loss: 0.6061 - acc: 0.8164 - auc_roc: 0.47 - ETA: 13s - loss: 0.6042 - acc:
0.8167 - auc_roc: 0.47 - ETA: 12s - loss: 0.6035 - acc: 0.8167 - auc_roc: 0.47 -
ETA: 12s - loss: 0.6023 - acc: 0.8170 - auc_roc: 0.47 - ETA: 11s - loss: 0.6019
- acc: 0.8171 - auc_roc: 0.47 - ETA: 10s - loss: 0.6011 - acc: 0.8174 - auc_roc:
0.47 - ETA: 9s - loss: 0.6014 - acc: 0.8177 - auc_roc: 0.4727 - ETA: 8s - loss:
0.6011 - acc: 0.8178 - auc_roc: 0.472 - ETA: 8s - loss: 0.6007 - acc: 0.8180 -
auc_roc: 0.472 - ETA: 7s - loss: 0.5996 - acc: 0.8183 - auc_roc: 0.472 - ETA: 6s
- loss: 0.5982 - acc: 0.8188 - auc_roc: 0.472 - ETA: 5s - loss: 0.5968 - acc:
0.8192 - auc_roc: 0.472 - ETA: 4s - loss: 0.5968 - acc: 0.8193 - auc_roc: 0.472
```

```
- ETA: 4s - loss: 0.5958 - acc: 0.8195 - auc_roc: 0.472 - ETA: 3s - loss: 0.5944
- acc: 0.8197 - auc_roc: 0.474 - ETA: 2s - loss: 0.5931 - acc: 0.8200 - auc_roc:
0.474 - ETA: 1s - loss: 0.5922 - acc: 0.8199 - auc_roc: 0.474 - ETA: 1s - loss:
0.5909 - acc: 0.8202 - auc_roc: 0.474 - ETA: 0s - loss: 0.5905 - acc: 0.8202 -
auc_roc: 0.474 - 60s 865us/step - loss: 0.5904 - acc: 0.8203 - auc_roc: 0.4747 -
val_loss: 0.4750 - val_acc: 0.8468 - val_auc_roc: 0.5095

Epoch 00002: val_auc_roc improved from 0.44346 to 0.50946, saving model to
weights-improvement-model2.hdf5
Epoch 3/30
69918/69918 [==============================] - ETA: 52s - loss: 0.5477 - acc:
0.8311 - auc_roc: 0.49 - ETA: 53s - loss: 0.5090 - acc: 0.8384 - auc_roc: 0.50 -
ETA: 52s - loss: 0.5157 - acc: 0.8389 - auc_roc: 0.49 - ETA: 50s - loss: 0.5299
- acc: 0.8345 - auc_roc: 0.48 - ETA: 50s - loss: 0.5374 - acc: 0.8297 - auc_roc:
0.48 - ETA: 49s - loss: 0.5379 - acc: 0.8306 - auc_roc: 0.49 - ETA: 48s - loss:
0.5385 - acc: 0.8311 - auc_roc: 0.49 - ETA: 47s - loss: 0.5379 - acc: 0.8293 -
auc_roc: 0.49 - ETA: 46s - loss: 0.5346 - acc: 0.8288 - auc_roc: 0.50 - ETA: 46s
- loss: 0.5348 - acc: 0.8269 - auc_roc: 0.50 - ETA: 45s - loss: 0.5349 - acc:
0.8249 - auc_roc: 0.50 - ETA: 44s - loss: 0.5314 - acc: 0.8254 - auc_roc: 0.50 -
ETA: 43s - loss: 0.5269 - acc: 0.8252 - auc_roc: 0.51 - ETA: 42s - loss: 0.5223
- acc: 0.8271 - auc_roc: 0.51 - ETA: 42s - loss: 0.5246 - acc: 0.8260 - auc_roc:
0.51 - ETA: 41s - loss: 0.5247 - acc: 0.8275 - auc_roc: 0.51 - ETA: 40s - loss:
0.5240 - acc: 0.8270 - auc_roc: 0.51 - ETA: 39s - loss: 0.5189 - acc: 0.8292 -
auc_roc: 0.51 - ETA: 39s - loss: 0.5185 - acc: 0.8292 - auc_roc: 0.51 - ETA: 38s
- loss: 0.5177 - acc: 0.8290 - auc_roc: 0.51 - ETA: 37s - loss: 0.5180 - acc:
0.8288 - auc_roc: 0.51 - ETA: 36s - loss: 0.5162 - acc: 0.8291 - auc_roc: 0.51 -
ETA: 35s - loss: 0.5140 - acc: 0.8292 - auc_roc: 0.52 - ETA: 34s - loss: 0.5127
- acc: 0.8297 - auc_roc: 0.52 - ETA: 34s - loss: 0.5118 - acc: 0.8308 - auc_roc:
0.51 - ETA: 33s - loss: 0.5120 - acc: 0.8302 - auc_roc: 0.52 - ETA: 32s - loss:
0.5123 - acc: 0.8300 - auc_roc: 0.51 - ETA: 31s - loss: 0.5115 - acc: 0.8301 -
auc_roc: 0.52 - ETA: 31s - loss: 0.5108 - acc: 0.8304 - auc_roc: 0.52 - ETA: 30s
- loss: 0.5111 - acc: 0.8304 - auc_roc: 0.52 - ETA: 29s - loss: 0.5108 - acc:
0.8306 - auc_roc: 0.52 - ETA: 28s - loss: 0.5093 - acc: 0.8310 - auc_roc: 0.52 -
ETA: 27s - loss: 0.5091 - acc: 0.8309 - auc_roc: 0.52 - ETA: 27s - loss: 0.5079
- acc: 0.8313 - auc_roc: 0.52 - ETA: 26s - loss: 0.5082 - acc: 0.8313 - auc_roc:
0.52 - ETA: 25s - loss: 0.5078 - acc: 0.8311 - auc_roc: 0.52 - ETA: 24s - loss:
0.5077 - acc: 0.8315 - auc_roc: 0.52 - ETA: 23s - loss: 0.5072 - acc: 0.8317 -
auc_roc: 0.52 - ETA: 23s - loss: 0.5062 - acc: 0.8323 - auc_roc: 0.52 - ETA: 22s
- loss: 0.5063 - acc: 0.8326 - auc_roc: 0.52 - ETA: 21s - loss: 0.5071 - acc:
0.8324 - auc_roc: 0.52 - ETA: 20s - loss: 0.5059 - acc: 0.8328 - auc_roc: 0.52 -
ETA: 19s - loss: 0.5052 - acc: 0.8327 - auc_roc: 0.52 - ETA: 19s - loss: 0.5056
- acc: 0.8324 - auc_roc: 0.52 - ETA: 18s - loss: 0.5057 - acc: 0.8324 - auc_roc:
0.52 - ETA: 17s - loss: 0.5047 - acc: 0.8327 - auc_roc: 0.52 - ETA: 16s - loss:
0.5056 - acc: 0.8325 - auc_roc: 0.52 - ETA: 16s - loss: 0.5053 - acc: 0.8324 -
auc_roc: 0.52 - ETA: 15s - loss: 0.5047 - acc: 0.8325 - auc_roc: 0.52 - ETA: 14s
- loss: 0.5042 - acc: 0.8325 - auc_roc: 0.52 - ETA: 13s - loss: 0.5037 - acc:
0.8327 - auc_roc: 0.52 - ETA: 12s - loss: 0.5022 - acc: 0.8335 - auc_roc: 0.52 -
ETA: 12s - loss: 0.5022 - acc: 0.8334 - auc_roc: 0.52 - ETA: 11s - loss: 0.5023
```

```
- acc: 0.8332 - auc_roc: 0.52 - ETA: 10s - loss: 0.5017 - acc: 0.8334 - auc_roc:
0.52 - ETA: 9s - loss: 0.5013 - acc: 0.8335 - auc_roc: 0.5227 - ETA: 8s - loss:
0.5009 - acc: 0.8337 - auc_roc: 0.522 - ETA: 8s - loss: 0.5002 - acc: 0.8339 -
auc_roc: 0.523 - ETA: 7s - loss: 0.4999 - acc: 0.8340 - auc_roc: 0.523 - ETA: 6s
- loss: 0.4996 - acc: 0.8342 - auc_roc: 0.523 - ETA: 5s - loss: 0.5001 - acc:
0.8340 - auc_roc: 0.523 - ETA: 4s - loss: 0.4997 - acc: 0.8340 - auc_roc: 0.524
- ETA: 4s - loss: 0.4988 - acc: 0.8342 - auc_roc: 0.525 - ETA: 3s - loss: 0.4986
- acc: 0.8343 - auc_roc: 0.525 - ETA: 2s - loss: 0.4989 - acc: 0.8342 - auc_roc:
0.524 - ETA: 1s - loss: 0.4990 - acc: 0.8341 - auc_roc: 0.524 - ETA: 1s - loss:
0.4991 - acc: 0.8339 - auc_roc: 0.524 - ETA: 0s - loss: 0.4987 - acc: 0.8340 -
auc_roc: 0.525 - 60s 864us/step - loss: 0.4987 - acc: 0.8340 - auc_roc: 0.5252 -
val_loss: 0.4772 - val_acc: 0.8468 - val_auc_roc: 0.5587

Epoch 00003: val_auc_roc improved from 0.50946 to 0.55868, saving model to
weights-improvement-model2.hdf5
Epoch 4/30
69918/69918 [==============================] - ETA: 55s - loss: 0.4412 - acc:
0.8467 - auc_roc: 0.56 - ETA: 53s - loss: 0.4558 - acc: 0.8398 - auc_roc: 0.56 -
ETA: 51s - loss: 0.4669 - acc: 0.8372 - auc_roc: 0.56 - ETA: 50s - loss: 0.4744
- acc: 0.8318 - auc_roc: 0.55 - ETA: 50s - loss: 0.4827 - acc: 0.8311 - auc_roc:
0.55 - ETA: 49s - loss: 0.4834 - acc: 0.8320 - auc_roc: 0.55 - ETA: 49s - loss:
0.4887 - acc: 0.8304 - auc_roc: 0.54 - ETA: 48s - loss: 0.4922 - acc: 0.8296 -
auc_roc: 0.54 - ETA: 47s - loss: 0.4942 - acc: 0.8298 - auc_roc: 0.53 - ETA: 46s
- loss: 0.4914 - acc: 0.8313 - auc_roc: 0.53 - ETA: 45s - loss: 0.4897 - acc:
0.8319 - auc_roc: 0.53 - ETA: 44s - loss: 0.4862 - acc: 0.8326 - auc_roc: 0.54 -
ETA: 43s - loss: 0.4867 - acc: 0.8328 - auc_roc: 0.54 - ETA: 42s - loss: 0.4846
- acc: 0.8342 - auc_roc: 0.54 - ETA: 41s - loss: 0.4831 - acc: 0.8344 - auc_roc:
0.54 - ETA: 40s - loss: 0.4822 - acc: 0.8352 - auc_roc: 0.54 - ETA: 39s - loss:
0.4807 - acc: 0.8355 - auc_roc: 0.54 - ETA: 39s - loss: 0.4811 - acc: 0.8349 -
auc_roc: 0.54 - ETA: 38s - loss: 0.4805 - acc: 0.8344 - auc_roc: 0.54 - ETA: 37s
- loss: 0.4816 - acc: 0.8338 - auc_roc: 0.54 - ETA: 36s - loss: 0.4834 - acc:
0.8331 - auc_roc: 0.54 - ETA: 35s - loss: 0.4824 - acc: 0.8337 - auc_roc: 0.53 -
ETA: 35s - loss: 0.4834 - acc: 0.8338 - auc_roc: 0.53 - ETA: 34s - loss: 0.4827
- acc: 0.8345 - auc_roc: 0.53 - ETA: 33s - loss: 0.4818 - acc: 0.8349 - auc_roc:
0.53 - ETA: 32s - loss: 0.4810 - acc: 0.8353 - auc_roc: 0.53 - ETA: 32s - loss:
0.4801 - acc: 0.8361 - auc_roc: 0.53 - ETA: 31s - loss: 0.4791 - acc: 0.8363 -
auc_roc: 0.53 - ETA: 30s - loss: 0.4780 - acc: 0.8366 - auc_roc: 0.53 - ETA: 29s
- loss: 0.4783 - acc: 0.8365 - auc_roc: 0.53 - ETA: 29s - loss: 0.4788 - acc:
0.8365 - auc_roc: 0.53 - ETA: 28s - loss: 0.4800 - acc: 0.8358 - auc_roc: 0.53 -
ETA: 27s - loss: 0.4787 - acc: 0.8362 - auc_roc: 0.53 - ETA: 26s - loss: 0.4797
- acc: 0.8359 - auc_roc: 0.53 - ETA: 26s - loss: 0.4795 - acc: 0.8359 - auc_roc:
0.53 - ETA: 25s - loss: 0.4779 - acc: 0.8361 - auc_roc: 0.53 - ETA: 24s - loss:
0.4768 - acc: 0.8365 - auc_roc: 0.53 - ETA: 23s - loss: 0.4762 - acc: 0.8367 -
auc_roc: 0.53 - ETA: 22s - loss: 0.4757 - acc: 0.8368 - auc_roc: 0.53 - ETA: 22s
- loss: 0.4761 - acc: 0.8367 - auc_roc: 0.53 - ETA: 21s - loss: 0.4760 - acc:
0.8368 - auc_roc: 0.53 - ETA: 20s - loss: 0.4753 - acc: 0.8370 - auc_roc: 0.54 -
ETA: 19s - loss: 0.4737 - acc: 0.8378 - auc_roc: 0.54 - ETA: 19s - loss: 0.4738
- acc: 0.8378 - auc_roc: 0.54 - ETA: 18s - loss: 0.4741 - acc: 0.8375 - auc_roc:
```

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0.54 - ETA: 17s - loss: 0.4744 - acc: 0.8374 - auc_roc: 0.53 - ETA: 16s - loss:
0.4751 - acc: 0.8369 - auc_roc: 0.54 - ETA: 15s - loss: 0.4736 - acc: 0.8374 -
auc_roc: 0.54 - ETA: 15s - loss: 0.4734 - acc: 0.8374 - auc_roc: 0.54 - ETA: 14s
- loss: 0.4730 - acc: 0.8376 - auc_roc: 0.54 - ETA: 13s - loss: 0.4722 - acc:
0.8379 - auc_roc: 0.54 - ETA: 12s - loss: 0.4716 - acc: 0.8382 - auc_roc: 0.54 -
ETA: 12s - loss: 0.4720 - acc: 0.8380 - auc_roc: 0.54 - ETA: 11s - loss: 0.4722
- acc: 0.8377 - auc_roc: 0.54 - ETA: 10s - loss: 0.4716 - acc: 0.8378 - auc_roc:
0.54 - ETA: 9s - loss: 0.4718 - acc: 0.8377 - auc_roc: 0.5415 - ETA: 8s - loss:
0.4717 - acc: 0.8377 - auc_roc: 0.541 - ETA: 8s - loss: 0.4711 - acc: 0.8378 -
auc_roc: 0.541 - ETA: 7s - loss: 0.4709 - acc: 0.8381 - auc_roc: 0.541 - ETA: 6s
- loss: 0.4710 - acc: 0.8379 - auc_roc: 0.541 - ETA: 5s - loss: 0.4711 - acc:
0.8378 - auc_roc: 0.541 - ETA: 4s - loss: 0.4712 - acc: 0.8377 - auc_roc: 0.540
- ETA: 4s - loss: 0.4707 - acc: 0.8380 - auc_roc: 0.540 - ETA: 3s - loss: 0.4706
- acc: 0.8378 - auc_roc: 0.541 - ETA: 2s - loss: 0.4698 - acc: 0.8383 - auc_roc:
0.540 - ETA: 1s - loss: 0.4701 - acc: 0.8382 - auc_roc: 0.540 - ETA: 1s - loss:
0.4699 - acc: 0.8383 - auc_roc: 0.540 - ETA: 0s - loss: 0.4699 - acc: 0.8382 -
auc_roc: 0.540 - 60s 864us/step - loss: 0.4699 - acc: 0.8382 - auc_roc: 0.5408 -
val_loss: 0.4410 - val_acc: 0.8468 - val_auc_roc: 0.5538

Epoch 00004: val_auc_roc did not improve from 0.55868
Epoch 5/30
69918/69918 [==============================] - ETA: 52s - loss: 0.4458 - acc:
0.8457 - auc_roc: 0.56 - ETA: 52s - loss: 0.4522 - acc: 0.8433 - auc_roc: 0.54 -
ETA: 51s - loss: 0.4648 - acc: 0.8428 - auc_roc: 0.53 - ETA: 50s - loss: 0.4769
- acc: 0.8359 - auc_roc: 0.53 - ETA: 49s - loss: 0.4756 - acc: 0.8342 - auc_roc:
0.53 - ETA: 49s - loss: 0.4751 - acc: 0.8328 - auc_roc: 0.54 - ETA: 48s - loss:
0.4736 - acc: 0.8323 - auc_roc: 0.54 - ETA: 47s - loss: 0.4738 - acc: 0.8323 -
auc_roc: 0.54 - ETA: 47s - loss: 0.4720 - acc: 0.8334 - auc_roc: 0.54 - ETA: 46s
- loss: 0.4707 - acc: 0.8341 - auc_roc: 0.54 - ETA: 45s - loss: 0.4667 - acc:
0.8350 - auc_roc: 0.55 - ETA: 44s - loss: 0.4709 - acc: 0.8329 - auc_roc: 0.55 -
ETA: 44s - loss: 0.4689 - acc: 0.8343 - auc_roc: 0.54 - ETA: 43s - loss: 0.4663
- acc: 0.8354 - auc_roc: 0.55 - ETA: 42s - loss: 0.4658 - acc: 0.8355 - auc_roc:
0.55 - ETA: 41s - loss: 0.4658 - acc: 0.8356 - auc_roc: 0.55 - ETA: 40s - loss:
0.4645 - acc: 0.8362 - auc_roc: 0.55 - ETA: 40s - loss: 0.4657 - acc: 0.8362 -
auc_roc: 0.55 - ETA: 39s - loss: 0.4630 - acc: 0.8374 - auc_roc: 0.55 - ETA: 38s
- loss: 0.4622 - acc: 0.8381 - auc_roc: 0.55 - ETA: 37s - loss: 0.4617 - acc:
0.8387 - auc_roc: 0.54 - ETA: 37s - loss: 0.4595 - acc: 0.8400 - auc_roc: 0.55 -
ETA: 36s - loss: 0.4590 - acc: 0.8404 - auc_roc: 0.54 - ETA: 35s - loss: 0.4591
- acc: 0.8403 - auc_roc: 0.55 - ETA: 34s - loss: 0.4604 - acc: 0.8402 - auc_roc:
0.54 - ETA: 34s - loss: 0.4608 - acc: 0.8403 - auc_roc: 0.54 - ETA: 33s - loss:
0.4593 - acc: 0.8413 - auc_roc: 0.54 - ETA: 32s - loss: 0.4571 - acc: 0.8420 -
auc_roc: 0.54 - ETA: 31s - loss: 0.4571 - acc: 0.8419 - auc_roc: 0.55 - ETA: 31s
- loss: 0.4568 - acc: 0.8424 - auc_roc: 0.54 - ETA: 30s - loss: 0.4569 - acc:
0.8423 - auc_roc: 0.55 - ETA: 29s - loss: 0.4569 - acc: 0.8426 - auc_roc: 0.54 -
ETA: 29s - loss: 0.4571 - acc: 0.8429 - auc_roc: 0.54 - ETA: 28s - loss: 0.4565
- acc: 0.8432 - auc_roc: 0.54 - ETA: 27s - loss: 0.4576 - acc: 0.8427 - auc_roc:
0.54 - ETA: 26s - loss: 0.4589 - acc: 0.8419 - auc_roc: 0.54 - ETA: 26s - loss:
0.4594 - acc: 0.8418 - auc_roc: 0.54 - ETA: 25s - loss: 0.4597 - acc: 0.8415 -
```

```
auc_roc: 0.54 - ETA: 24s - loss: 0.4589 - acc: 0.8421 - auc_roc: 0.54 - ETA: 23s
- loss: 0.4592 - acc: 0.8420 - auc_roc: 0.54 - ETA: 23s - loss: 0.4580 - acc:
0.8425 - auc_roc: 0.54 - ETA: 22s - loss: 0.4573 - acc: 0.8428 - auc_roc: 0.54 -
ETA: 21s - loss: 0.4569 - acc: 0.8432 - auc_roc: 0.54 - ETA: 20s - loss: 0.4567
- acc: 0.8431 - auc_roc: 0.54 - ETA: 19s - loss: 0.4564 - acc: 0.8431 - auc_roc:
0.54 - ETA: 18s - loss: 0.4566 - acc: 0.8429 - auc_roc: 0.54 - ETA: 18s - loss:
0.4565 - acc: 0.8432 - auc_roc: 0.54 - ETA: 17s - loss: 0.4567 - acc: 0.8432 -
auc_roc: 0.54 - ETA: 16s - loss: 0.4571 - acc: 0.8432 - auc_roc: 0.54 - ETA: 15s
- loss: 0.4573 - acc: 0.8431 - auc_roc: 0.54 - ETA: 14s - loss: 0.4573 - acc:
0.8431 - auc_roc: 0.54 - ETA: 14s - loss: 0.4576 - acc: 0.8428 - auc_roc: 0.54 -
ETA: 13s - loss: 0.4579 - acc: 0.8426 - auc_roc: 0.54 - ETA: 12s - loss: 0.4577
- acc: 0.8424 - auc_roc: 0.54 - ETA: 11s - loss: 0.4578 - acc: 0.8422 - auc_roc:
0.54 - ETA: 10s - loss: 0.4576 - acc: 0.8422 - auc_roc: 0.54 - ETA: 9s - loss:
0.4579 - acc: 0.8420 - auc_roc: 0.5471 - ETA: 8s - loss: 0.4582 - acc: 0.8418 -
auc_roc: 0.546 - ETA: 8s - loss: 0.4581 - acc: 0.8418 - auc_roc: 0.547 - ETA: 7s
- loss: 0.4576 - acc: 0.8421 - auc_roc: 0.547 - ETA: 6s - loss: 0.4572 - acc:
0.8423 - auc_roc: 0.547 - ETA: 5s - loss: 0.4572 - acc: 0.8423 - auc_roc: 0.546
- ETA: 4s - loss: 0.4575 - acc: 0.8421 - auc_roc: 0.546 - ETA: 3s - loss: 0.4577
- acc: 0.8420 - auc_roc: 0.546 - ETA: 2s - loss: 0.4581 - acc: 0.8418 - auc_roc:
0.546 - ETA: 1s - loss: 0.4583 - acc: 0.8416 - auc_roc: 0.546 - ETA: 1s - loss:
0.4579 - acc: 0.8418 - auc_roc: 0.546 - ETA: 0s - loss: 0.4576 - acc: 0.8418 -
auc_roc: 0.546 - 68s 967us/step - loss: 0.4577 - acc: 0.8418 - auc_roc: 0.5466 -
val_loss: 0.4386 - val_acc: 0.8468 - val_auc_roc: 0.5909

Epoch 00005: val_auc_roc improved from 0.55868 to 0.59085, saving model to
weights-improvement-model2.hdf5
Epoch 6/30
69918/69918 [==============================] - ETA: 1:03 - loss: 0.5128 - acc:
0.8125 - auc_roc: 0.538 - ETA: 1:02 - loss: 0.4855 - acc: 0.8267 - auc_roc:
0.544 - ETA: 1:01 - loss: 0.4679 - acc: 0.8369 - auc_roc: 0.547 - ETA: 1:00 -
loss: 0.4685 - acc: 0.8372 - auc_roc: 0.539 - ETA: 59s - loss: 0.4744 - acc:
0.8361 - auc_roc: 0.538 - ETA: 58s - loss: 0.4693 - acc: 0.8369 - auc_roc: 0.54
- ETA: 57s - loss: 0.4638 - acc: 0.8391 - auc_roc: 0.54 - ETA: 56s - loss:
0.4640 - acc: 0.8396 - auc_roc: 0.54 - ETA: 55s - loss: 0.4621 - acc: 0.8401 -
auc_roc: 0.54 - ETA: 55s - loss: 0.4614 - acc: 0.8399 - auc_roc: 0.54 - ETA: 54s
- loss: 0.4617 - acc: 0.8390 - auc_roc: 0.54 - ETA: 52s - loss: 0.4646 - acc:
0.8381 - auc_roc: 0.54 - ETA: 51s - loss: 0.4602 - acc: 0.8399 - auc_roc: 0.54 -
ETA: 50s - loss: 0.4588 - acc: 0.8403 - auc_roc: 0.54 - ETA: 50s - loss: 0.4571
- acc: 0.8409 - auc_roc: 0.54 - ETA: 49s - loss: 0.4562 - acc: 0.8418 - auc_roc:
0.54 - ETA: 48s - loss: 0.4560 - acc: 0.8416 - auc_roc: 0.54 - ETA: 47s - loss:
0.4552 - acc: 0.8416 - auc_roc: 0.54 - ETA: 46s - loss: 0.4544 - acc: 0.8417 -
auc_roc: 0.54 - ETA: 45s - loss: 0.4532 - acc: 0.8423 - auc_roc: 0.54 - ETA: 44s
- loss: 0.4522 - acc: 0.8427 - auc_roc: 0.55 - ETA: 43s - loss: 0.4523 - acc:
0.8430 - auc_roc: 0.55 - ETA: 42s - loss: 0.4530 - acc: 0.8431 - auc_roc: 0.54 -
ETA: 41s - loss: 0.4529 - acc: 0.8431 - auc_roc: 0.54 - ETA: 40s - loss: 0.4527
- acc: 0.8434 - auc_roc: 0.54 - ETA: 39s - loss: 0.4536 - acc: 0.8428 - auc_roc:
0.54 - ETA: 38s - loss: 0.4535 - acc: 0.8427 - auc_roc: 0.54 - ETA: 37s - loss:
0.4528 - acc: 0.8429 - auc_roc: 0.54 - ETA: 36s - loss: 0.4528 - acc: 0.8427 -
```

```
auc_roc: 0.54 - ETA: 35s - loss: 0.4531 - acc: 0.8425 - auc_roc: 0.55 - ETA: 34s
- loss: 0.4520 - acc: 0.8428 - auc_roc: 0.55 - ETA: 33s - loss: 0.4518 - acc:
0.8429 - auc_roc: 0.55 - ETA: 32s - loss: 0.4512 - acc: 0.8433 - auc_roc: 0.55 -
ETA: 31s - loss: 0.4505 - acc: 0.8438 - auc_roc: 0.55 - ETA: 30s - loss: 0.4505
- acc: 0.8435 - auc_roc: 0.55 - ETA: 29s - loss: 0.4506 - acc: 0.8432 - auc_roc:
0.55 - ETA: 28s - loss: 0.4512 - acc: 0.8429 - auc_roc: 0.55 - ETA: 27s - loss:
0.4507 - acc: 0.8428 - auc_roc: 0.55 - ETA: 27s - loss: 0.4510 - acc: 0.8427 -
auc_roc: 0.55 - ETA: 26s - loss: 0.4506 - acc: 0.8429 - auc_roc: 0.55 - ETA: 25s
- loss: 0.4509 - acc: 0.8430 - auc_roc: 0.55 - ETA: 24s - loss: 0.4521 - acc:
0.8426 - auc_roc: 0.55 - ETA: 23s - loss: 0.4514 - acc: 0.8426 - auc_roc: 0.55 -
ETA: 22s - loss: 0.4513 - acc: 0.8427 - auc_roc: 0.55 - ETA: 21s - loss: 0.4511
- acc: 0.8428 - auc_roc: 0.55 - ETA: 20s - loss: 0.4513 - acc: 0.8426 - auc_roc:
0.55 - ETA: 19s - loss: 0.4511 - acc: 0.8424 - auc_roc: 0.55 - ETA: 18s - loss:
0.4509 - acc: 0.8426 - auc_roc: 0.55 - ETA: 17s - loss: 0.4518 - acc: 0.8424 -
auc_roc: 0.55 - ETA: 16s - loss: 0.4520 - acc: 0.8424 - auc_roc: 0.55 - ETA: 16s
- loss: 0.4520 - acc: 0.8423 - auc_roc: 0.55 - ETA: 15s - loss: 0.4523 - acc:
0.8421 - auc_roc: 0.55 - ETA: 14s - loss: 0.4513 - acc: 0.8426 - auc_roc: 0.55 -
ETA: 13s - loss: 0.4514 - acc: 0.8427 - auc_roc: 0.55 - ETA: 12s - loss: 0.4509
- acc: 0.8429 - auc_roc: 0.55 - ETA: 11s - loss: 0.4506 - acc: 0.8431 - auc_roc:
0.55 - ETA: 10s - loss: 0.4503 - acc: 0.8432 - auc_roc: 0.55 - ETA: 9s - loss:
0.4500 - acc: 0.8434 - auc_roc: 0.5527 - ETA: 8s - loss: 0.4492 - acc: 0.8438 -
auc_roc: 0.552 - ETA: 7s - loss: 0.4488 - acc: 0.8439 - auc_roc: 0.553 - ETA: 6s
- loss: 0.4485 - acc: 0.8440 - auc_roc: 0.553 - ETA: 5s - loss: 0.4487 - acc:
0.8440 - auc_roc: 0.552 - ETA: 4s - loss: 0.4485 - acc: 0.8441 - auc_roc: 0.553
- ETA: 3s - loss: 0.4491 - acc: 0.8438 - auc_roc: 0.553 - ETA: 3s - loss: 0.4497
- acc: 0.8437 - auc_roc: 0.552 - ETA: 2s - loss: 0.4501 - acc: 0.8435 - auc_roc:
0.552 - ETA: 1s - loss: 0.4504 - acc: 0.8433 - auc_roc: 0.552 - ETA: 0s - loss:
0.4502 - acc: 0.8435 - auc_roc: 0.552 - 70s 1ms/step - loss: 0.4504 - acc:
0.8434 - auc_roc: 0.5521 - val_loss: 0.4430 - val_acc: 0.8468 - val_auc_roc:
0.6038

Epoch 00006: val_auc_roc improved from 0.59085 to 0.60380, saving model to
weights-improvement-model2.hdf5
Epoch 7/30
69918/69918 [==============================] - ETA: 58s - loss: 0.4048 - acc:
0.8770 - auc_roc: 0.54 - ETA: 58s - loss: 0.4259 - acc: 0.8560 - auc_roc: 0.56 -
ETA: 58s - loss: 0.4304 - acc: 0.8525 - auc_roc: 0.57 - ETA: 57s - loss: 0.4257
- acc: 0.8560 - auc_roc: 0.56 - ETA: 56s - loss: 0.4261 - acc: 0.8545 - auc_roc:
0.57 - ETA: 57s - loss: 0.4263 - acc: 0.8538 - auc_roc: 0.57 - ETA: 57s - loss:
0.4290 - acc: 0.8521 - auc_roc: 0.57 - ETA: 57s - loss: 0.4288 - acc: 0.8512 -
auc_roc: 0.57 - ETA: 57s - loss: 0.4256 - acc: 0.8526 - auc_roc: 0.57 - ETA: 55s
- loss: 0.4324 - acc: 0.8496 - auc_roc: 0.57 - ETA: 53s - loss: 0.4321 - acc:
0.8492 - auc_roc: 0.57 - ETA: 52s - loss: 0.4323 - acc: 0.8490 - auc_roc: 0.57 -
ETA: 51s - loss: 0.4329 - acc: 0.8484 - auc_roc: 0.57 - ETA: 50s - loss: 0.4355
- acc: 0.8469 - auc_roc: 0.57 - ETA: 49s - loss: 0.4360 - acc: 0.8464 - auc_roc:
0.57 - ETA: 48s - loss: 0.4372 - acc: 0.8458 - auc_roc: 0.57 - ETA: 46s - loss:
0.4364 - acc: 0.8466 - auc_roc: 0.57 - ETA: 45s - loss: 0.4385 - acc: 0.8454 -
auc_roc: 0.57 - ETA: 44s - loss: 0.4375 - acc: 0.8456 - auc_roc: 0.57 - ETA: 43s
```

- loss: 0.4390 - acc: 0.8447 - auc_roc: 0.57 - ETA: 42s - loss: 0.4381 - acc:
0.8454 - auc_roc: 0.57 - ETA: 42s - loss: 0.4392 - acc: 0.8450 - auc_roc: 0.57 -
ETA: 41s - loss: 0.4404 - acc: 0.8443 - auc_roc: 0.56 - ETA: 40s - loss: 0.4398
- acc: 0.8446 - auc_roc: 0.56 - ETA: 39s - loss: 0.4409 - acc: 0.8441 - auc_roc:
0.56 - ETA: 38s - loss: 0.4406 - acc: 0.8442 - auc_roc: 0.56 - ETA: 37s - loss:
0.4408 - acc: 0.8441 - auc_roc: 0.56 - ETA: 37s - loss: 0.4401 - acc: 0.8447 -
auc_roc: 0.56 - ETA: 36s - loss: 0.4405 - acc: 0.8443 - auc_roc: 0.56 - ETA: 35s
- loss: 0.4394 - acc: 0.8448 - auc_roc: 0.57 - ETA: 34s - loss: 0.4402 - acc:
0.8448 - auc_roc: 0.56 - ETA: 33s - loss: 0.4398 - acc: 0.8451 - auc_roc: 0.56 -
ETA: 32s - loss: 0.4390 - acc: 0.8454 - auc_roc: 0.56 - ETA: 31s - loss: 0.4383
- acc: 0.8462 - auc_roc: 0.56 - ETA: 30s - loss: 0.4379 - acc: 0.8463 - auc_roc:
0.56 - ETA: 29s - loss: 0.4380 - acc: 0.8465 - auc_roc: 0.56 - ETA: 28s - loss:
0.4379 - acc: 0.8462 - auc_roc: 0.56 - ETA: 27s - loss: 0.4390 - acc: 0.8456 -
auc_roc: 0.56 - ETA: 26s - loss: 0.4398 - acc: 0.8451 - auc_roc: 0.56 - ETA: 26s
- loss: 0.4406 - acc: 0.8450 - auc_roc: 0.56 - ETA: 25s - loss: 0.4415 - acc:
0.8444 - auc_roc: 0.56 - ETA: 24s - loss: 0.4425 - acc: 0.8439 - auc_roc: 0.56 -
ETA: 23s - loss: 0.4427 - acc: 0.8438 - auc_roc: 0.56 - ETA: 22s - loss: 0.4426
- acc: 0.8438 - auc_roc: 0.56 - ETA: 21s - loss: 0.4427 - acc: 0.8436 - auc_roc:
0.56 - ETA: 20s - loss: 0.4423 - acc: 0.8438 - auc_roc: 0.56 - ETA: 20s - loss:
0.4424 - acc: 0.8438 - auc_roc: 0.56 - ETA: 19s - loss: 0.4426 - acc: 0.8435 -
auc_roc: 0.56 - ETA: 18s - loss: 0.4420 - acc: 0.8437 - auc_roc: 0.56 - ETA: 17s
- loss: 0.4415 - acc: 0.8438 - auc_roc: 0.56 - ETA: 16s - loss: 0.4412 - acc:
0.8439 - auc_roc: 0.56 - ETA: 15s - loss: 0.4415 - acc: 0.8438 - auc_roc: 0.56 -
ETA: 14s - loss: 0.4416 - acc: 0.8438 - auc_roc: 0.56 - ETA: 13s - loss: 0.4418
- acc: 0.8438 - auc_roc: 0.56 - ETA: 12s - loss: 0.4420 - acc: 0.8439 - auc_roc:
0.56 - ETA: 11s - loss: 0.4418 - acc: 0.8441 - auc_roc: 0.56 - ETA: 10s - loss:
0.4418 - acc: 0.8441 - auc_roc: 0.56 - ETA: 9s - loss: 0.4425 - acc: 0.8438 -
auc_roc: 0.5641 - ETA: 8s - loss: 0.4427 - acc: 0.8437 - auc_roc: 0.563 - ETA:
7s - loss: 0.4422 - acc: 0.8440 - auc_roc: 0.563 - ETA: 6s - loss: 0.4421 - acc:
0.8441 - auc_roc: 0.563 - ETA: 6s - loss: 0.4428 - acc: 0.8436 - auc_roc: 0.562
- ETA: 5s - loss: 0.4431 - acc: 0.8436 - auc_roc: 0.562 - ETA: 4s - loss: 0.4428
- acc: 0.8437 - auc_roc: 0.562 - ETA: 3s - loss: 0.4424 - acc: 0.8440 - auc_roc:
0.562 - ETA: 2s - loss: 0.4421 - acc: 0.8441 - auc_roc: 0.563 - ETA: 1s - loss:
0.4421 - acc: 0.8441 - auc_roc: 0.562 - ETA: 0s - loss: 0.4417 - acc: 0.8444 -
auc_roc: 0.562 - 72s 1ms/step - loss: 0.4416 - acc: 0.8444 - auc_roc: 0.5623 -
val_loss: 0.4291 - val_acc: 0.8468 - val_auc_roc: 0.6119

Epoch 00007: val_auc_roc improved from 0.60380 to 0.61192, saving model to
weights-improvement-model2.hdf5
Epoch 8/30
69918/69918 [==============================] - ETA: 58s - loss: 0.4426 - acc:
0.8369 - auc_roc: 0.61 - ETA: 57s - loss: 0.4269 - acc: 0.8501 - auc_roc: 0.59 -
ETA: 56s - loss: 0.4369 - acc: 0.8454 - auc_roc: 0.58 - ETA: 56s - loss: 0.4319
- acc: 0.8489 - auc_roc: 0.56 - ETA: 55s - loss: 0.4342 - acc: 0.8479 - auc_roc:
0.56 - ETA: 55s - loss: 0.4307 - acc: 0.8511 - auc_roc: 0.56 - ETA: 54s - loss:
0.4321 - acc: 0.8506 - auc_roc: 0.56 - ETA: 53s - loss: 0.4382 - acc: 0.8474 -
auc_roc: 0.56 - ETA: 52s - loss: 0.4369 - acc: 0.8487 - auc_roc: 0.56 - ETA: 52s
- loss: 0.4366 - acc: 0.8481 - auc_roc: 0.56 - ETA: 51s - loss: 0.4334 - acc:

```
0.8497 - auc_roc: 0.56 - ETA: 50s - loss: 0.4337 - acc: 0.8483 - auc_roc: 0.56 -
ETA: 50s - loss: 0.4326 - acc: 0.8487 - auc_roc: 0.56 - ETA: 49s - loss: 0.4313
- acc: 0.8491 - auc_roc: 0.56 - ETA: 49s - loss: 0.4327 - acc: 0.8485 - auc_roc:
0.56 - ETA: 48s - loss: 0.4340 - acc: 0.8477 - auc_roc: 0.56 - ETA: 47s - loss:
0.4348 - acc: 0.8473 - auc_roc: 0.56 - ETA: 47s - loss: 0.4356 - acc: 0.8471 -
auc_roc: 0.56 - ETA: 46s - loss: 0.4359 - acc: 0.8473 - auc_roc: 0.56 - ETA: 45s
- loss: 0.4355 - acc: 0.8472 - auc_roc: 0.56 - ETA: 44s - loss: 0.4349 - acc:
0.8476 - auc_roc: 0.56 - ETA: 43s - loss: 0.4361 - acc: 0.8470 - auc_roc: 0.56 -
ETA: 42s - loss: 0.4353 - acc: 0.8471 - auc_roc: 0.56 - ETA: 41s - loss: 0.4360
- acc: 0.8466 - auc_roc: 0.56 - ETA: 40s - loss: 0.4372 - acc: 0.8459 - auc_roc:
0.56 - ETA: 39s - loss: 0.4375 - acc: 0.8456 - auc_roc: 0.56 - ETA: 38s - loss:
0.4370 - acc: 0.8458 - auc_roc: 0.56 - ETA: 37s - loss: 0.4372 - acc: 0.8453 -
auc_roc: 0.56 - ETA: 37s - loss: 0.4365 - acc: 0.8454 - auc_roc: 0.57 - ETA: 36s
- loss: 0.4374 - acc: 0.8450 - auc_roc: 0.57 - ETA: 35s - loss: 0.4362 - acc:
0.8454 - auc_roc: 0.57 - ETA: 34s - loss: 0.4370 - acc: 0.8451 - auc_roc: 0.56 -
ETA: 33s - loss: 0.4377 - acc: 0.8447 - auc_roc: 0.57 - ETA: 32s - loss: 0.4377
- acc: 0.8444 - auc_roc: 0.57 - ETA: 31s - loss: 0.4373 - acc: 0.8446 - auc_roc:
0.57 - ETA: 30s - loss: 0.4372 - acc: 0.8445 - auc_roc: 0.57 - ETA: 29s - loss:
0.4378 - acc: 0.8443 - auc_roc: 0.57 - ETA: 28s - loss: 0.4379 - acc: 0.8442 -
auc_roc: 0.57 - ETA: 27s - loss: 0.4383 - acc: 0.8438 - auc_roc: 0.57 - ETA: 26s
- loss: 0.4381 - acc: 0.8437 - auc_roc: 0.57 - ETA: 25s - loss: 0.4386 - acc:
0.8434 - auc_roc: 0.57 - ETA: 24s - loss: 0.4386 - acc: 0.8433 - auc_roc: 0.57 -
ETA: 23s - loss: 0.4383 - acc: 0.8434 - auc_roc: 0.57 - ETA: 22s - loss: 0.4380
- acc: 0.8436 - auc_roc: 0.57 - ETA: 21s - loss: 0.4381 - acc: 0.8435 - auc_roc:
0.57 - ETA: 20s - loss: 0.4378 - acc: 0.8437 - auc_roc: 0.57 - ETA: 20s - loss:
0.4374 - acc: 0.8439 - auc_roc: 0.57 - ETA: 19s - loss: 0.4375 - acc: 0.8439 -
auc_roc: 0.57 - ETA: 18s - loss: 0.4381 - acc: 0.8435 - auc_roc: 0.57 - ETA: 17s
- loss: 0.4379 - acc: 0.8436 - auc_roc: 0.57 - ETA: 16s - loss: 0.4377 - acc:
0.8437 - auc_roc: 0.57 - ETA: 15s - loss: 0.4377 - acc: 0.8438 - auc_roc: 0.57 -
ETA: 14s - loss: 0.4381 - acc: 0.8436 - auc_roc: 0.57 - ETA: 13s - loss: 0.4380
- acc: 0.8439 - auc_roc: 0.57 - ETA: 12s - loss: 0.4377 - acc: 0.8441 - auc_roc:
0.57 - ETA: 11s - loss: 0.4378 - acc: 0.8440 - auc_roc: 0.57 - ETA: 10s - loss:
0.4374 - acc: 0.8442 - auc_roc: 0.57 - ETA: 9s - loss: 0.4377 - acc: 0.8439 -
auc_roc: 0.5735 - ETA: 8s - loss: 0.4380 - acc: 0.8437 - auc_roc: 0.573 - ETA:
7s - loss: 0.4378 - acc: 0.8438 - auc_roc: 0.573 - ETA: 6s - loss: 0.4367 - acc:
0.8443 - auc_roc: 0.574 - ETA: 5s - loss: 0.4365 - acc: 0.8443 - auc_roc: 0.574
- ETA: 5s - loss: 0.4361 - acc: 0.8446 - auc_roc: 0.574 - ETA: 4s - loss: 0.4358
- acc: 0.8446 - auc_roc: 0.575 - ETA: 3s - loss: 0.4356 - acc: 0.8447 - auc_roc:
0.575 - ETA: 2s - loss: 0.4351 - acc: 0.8450 - auc_roc: 0.576 - ETA: 1s - loss:
0.4348 - acc: 0.8450 - auc_roc: 0.576 - ETA: 0s - loss: 0.4348 - acc: 0.8451 -
auc_roc: 0.576 - 72s 1ms/step - loss: 0.4350 - acc: 0.8450 - auc_roc: 0.5762 -
val_loss: 0.4208 - val_acc: 0.8468 - val_auc_roc: 0.6270

Epoch 00008: val_auc_roc improved from 0.61192 to 0.62704, saving model to
weights-improvement-model2.hdf5
Epoch 9/30
69918/69918 [==============================] - ETA: 1:05 - loss: 0.4213 - acc:
0.8477 - auc_roc: 0.618 - ETA: 1:03 - loss: 0.4254 - acc: 0.8467 - auc_roc:
```

0.603 - ETA: 1:00 - loss: 0.4250 - acc: 0.8467 - auc_roc: 0.598 - ETA: 58s - loss: 0.4277 - acc: 0.8462 - auc_roc: 0.594 - ETA: 57s - loss: 0.4307 - acc: 0.8453 - auc_roc: 0.58 - ETA: 56s - loss: 0.4380 - acc: 0.8420 - auc_roc: 0.58 - ETA: 55s - loss: 0.4385 - acc: 0.8418 - auc_roc: 0.58 - ETA: 54s - loss: 0.4362 - acc: 0.8425 - auc_roc: 0.58 - ETA: 53s - loss: 0.4339 - acc: 0.8441 - auc_roc: 0.58 - ETA: 52s - loss: 0.4339 - acc: 0.8445 - auc_roc: 0.58 - ETA: 51s - loss: 0.4332 - acc: 0.8444 - auc_roc: 0.58 - ETA: 50s - loss: 0.4349 - acc: 0.8441 - auc_roc: 0.58 - ETA: 49s - loss: 0.4346 - acc: 0.8439 - auc_roc: 0.58 - ETA: 48s - loss: 0.4347 - acc: 0.8436 - auc_roc: 0.58 - ETA: 47s - loss: 0.4348 - acc: 0.8436 - auc_roc: 0.58 - ETA: 46s - loss: 0.4336 - acc: 0.8438 - auc_roc: 0.58 - ETA: 45s - loss: 0.4350 - acc: 0.8435 - auc_roc: 0.58 - ETA: 44s - loss: 0.4350 - acc: 0.8435 - auc_roc: 0.58 - ETA: 43s - loss: 0.4340 - acc: 0.8441 - auc_roc: 0.58 - ETA: 42s - loss: 0.4351 - acc: 0.8441 - auc_roc: 0.58 - ETA: 41s - loss: 0.4342 - acc: 0.8440 - auc_roc: 0.58 - ETA: 40s - loss: 0.4339 - acc: 0.8439 - auc_roc: 0.58 - ETA: 40s - loss: 0.4334 - acc: 0.8442 - auc_roc: 0.58 - ETA: 39s - loss: 0.4323 - acc: 0.8444 - auc_roc: 0.58 - ETA: 38s - loss: 0.4330 - acc: 0.8439 - auc_roc: 0.58 - ETA: 37s - loss: 0.4321 - acc: 0.8445 - auc_roc: 0.58 - ETA: 36s - loss: 0.4319 - acc: 0.8447 - auc_roc: 0.58 - ETA: 35s - loss: 0.4330 - acc: 0.8442 - auc_roc: 0.58 - ETA: 34s - loss: 0.4338 - acc: 0.8437 - auc_roc: 0.58 - ETA: 33s - loss: 0.4337 - acc: 0.8438 - auc_roc: 0.58 - ETA: 32s - loss: 0.4319 - acc: 0.8447 - auc_roc: 0.58 - ETA: 32s - loss: 0.4313 - acc: 0.8449 - auc_roc: 0.58 - ETA: 31s - loss: 0.4321 - acc: 0.8445 - auc_roc: 0.58 - ETA: 30s - loss: 0.4315 - acc: 0.8447 - auc_roc: 0.58 - ETA: 29s - loss: 0.4314 - acc: 0.8446 - auc_roc: 0.59 - ETA: 28s - loss: 0.4313 - acc: 0.8448 - auc_roc: 0.59 - ETA: 27s - loss: 0.4302 - acc: 0.8452 - auc_roc: 0.59 - ETA: 26s - loss: 0.4289 - acc: 0.8460 - auc_roc: 0.59 - ETA: 25s - loss: 0.4276 - acc: 0.8467 - auc_roc: 0.59 - ETA: 25s - loss: 0.4280 - acc: 0.8464 - auc_roc: 0.59 - ETA: 24s - loss: 0.4291 - acc: 0.8459 - auc_roc: 0.59 - ETA: 23s - loss: 0.4302 - acc: 0.8452 - auc_roc: 0.59 - ETA: 22s - loss: 0.4305 - acc: 0.8450 - auc_roc: 0.59 - ETA: 21s - loss: 0.4302 - acc: 0.8452 - auc_roc: 0.59 - ETA: 20s - loss: 0.4303 - acc: 0.8449 - auc_roc: 0.59 - ETA: 19s - loss: 0.4299 - acc: 0.8451 - auc_roc: 0.59 - ETA: 19s - loss: 0.4296 - acc: 0.8452 - auc_roc: 0.59 - ETA: 18s - loss: 0.4297 - acc: 0.8452 - auc_roc: 0.59 - ETA: 17s - loss: 0.4293 - acc: 0.8455 - auc_roc: 0.59 - ETA: 16s - loss: 0.4287 - acc: 0.8458 - auc_roc: 0.59 - ETA: 15s - loss: 0.4281 - acc: 0.8462 - auc_roc: 0.59 - ETA: 14s - loss: 0.4275 - acc: 0.8465 - auc_roc: 0.59 - ETA: 13s - loss: 0.4281 - acc: 0.8464 - auc_roc: 0.59 - ETA: 12s - loss: 0.4284 - acc: 0.8462 - auc_roc: 0.59 - ETA: 12s - loss: 0.4280 - acc: 0.8463 - auc_roc: 0.59 - ETA: 11s - loss: 0.4284 - acc: 0.8461 - auc_roc: 0.59 - ETA: 10s - loss: 0.4283 - acc: 0.8462 - auc_roc: 0.59 - ETA: 9s - loss: 0.4285 - acc: 0.8461 - auc_roc: 0.5936 - ETA: 8s - loss: 0.4282 - acc: 0.8461 - auc_roc: 0.594 - ETA: 7s - loss: 0.4283 - acc: 0.8461 - auc_roc: 0.594 - ETA: 6s - loss: 0.4281 - acc: 0.8461 - auc_roc: 0.595 - ETA: 5s - loss: 0.4275 - acc: 0.8463 - auc_roc: 0.596 - ETA: 4s - loss: 0.4277 - acc: 0.8461 - auc_roc: 0.596 - ETA: 3s - loss: 0.4276 - acc: 0.8461 - auc_roc: 0.596 - ETA: 2s - loss: 0.4279 - acc: 0.8458 - auc_roc: 0.596 - ETA: 2s - loss: 0.4277 - acc: 0.8458 - auc_roc: 0.597 - ETA: 1s - loss: 0.4275 - acc: 0.8458 - auc_roc: 0.597 - ETA: 0s - loss: 0.4282 - acc: 0.8454 - auc_roc: 0.597 - 70s 1ms/step - loss: 0.4282 - acc: 0.8454 - auc_roc: 0.5979 - val_loss: 0.4114 - val_acc: 0.8468 - val_auc_roc: 0.6660

```
Epoch 00009: val_auc_roc improved from 0.62704 to 0.66597, saving model to
weights-improvement-model2.hdf5
Epoch 10/30
69918/69918 [==============================] - ETA: 1:01 - loss: 0.4564 - acc:
0.8262 - auc_roc: 0.606 - ETA: 1:02 - loss: 0.4346 - acc: 0.8374 - auc_roc:
0.621 - ETA: 1:01 - loss: 0.4259 - acc: 0.8418 - auc_roc: 0.628 - ETA: 1:01 -
loss: 0.4261 - acc: 0.8416 - auc_roc: 0.625 - ETA: 1:00 - loss: 0.4337 - acc:
0.8373 - auc_roc: 0.622 - ETA: 59s - loss: 0.4341 - acc: 0.8377 - auc_roc: 0.619
- ETA: 59s - loss: 0.4367 - acc: 0.8372 - auc_roc: 0.61 - ETA: 58s - loss:
0.4384 - acc: 0.8358 - auc_roc: 0.62 - ETA: 57s - loss: 0.4375 - acc: 0.8365 -
auc_roc: 0.62 - ETA: 56s - loss: 0.4354 - acc: 0.8379 - auc_roc: 0.62 - ETA: 56s
- loss: 0.4356 - acc: 0.8373 - auc_roc: 0.62 - ETA: 55s - loss: 0.4331 - acc:
0.8383 - auc_roc: 0.62 - ETA: 54s - loss: 0.4335 - acc: 0.8383 - auc_roc: 0.62 -
ETA: 53s - loss: 0.4335 - acc: 0.8384 - auc_roc: 0.62 - ETA: 52s - loss: 0.4323
- acc: 0.8393 - auc_roc: 0.62 - ETA: 51s - loss: 0.4320 - acc: 0.8401 - auc_roc:
0.62 - ETA: 50s - loss: 0.4315 - acc: 0.8406 - auc_roc: 0.62 - ETA: 49s - loss:
0.4304 - acc: 0.8414 - auc_roc: 0.62 - ETA: 48s - loss: 0.4299 - acc: 0.8422 -
auc_roc: 0.61 - ETA: 47s - loss: 0.4288 - acc: 0.8425 - auc_roc: 0.61 - ETA: 46s
- loss: 0.4291 - acc: 0.8424 - auc_roc: 0.61 - ETA: 45s - loss: 0.4271 - acc:
0.8434 - auc_roc: 0.61 - ETA: 44s - loss: 0.4272 - acc: 0.8430 - auc_roc: 0.62 -
ETA: 43s - loss: 0.4264 - acc: 0.8434 - auc_roc: 0.62 - ETA: 42s - loss: 0.4260
- acc: 0.8436 - auc_roc: 0.62 - ETA: 41s - loss: 0.4263 - acc: 0.8431 - auc_roc:
0.62 - ETA: 40s - loss: 0.4258 - acc: 0.8434 - auc_roc: 0.62 - ETA: 39s - loss:
0.4265 - acc: 0.8431 - auc_roc: 0.62 - ETA: 38s - loss: 0.4264 - acc: 0.8429 -
auc_roc: 0.62 - ETA: 37s - loss: 0.4270 - acc: 0.8425 - auc_roc: 0.62 - ETA: 36s
- loss: 0.4264 - acc: 0.8429 - auc_roc: 0.62 - ETA: 35s - loss: 0.4253 - acc:
0.8433 - auc_roc: 0.62 - ETA: 34s - loss: 0.4241 - acc: 0.8439 - auc_roc: 0.62 -
ETA: 33s - loss: 0.4239 - acc: 0.8438 - auc_roc: 0.62 - ETA: 32s - loss: 0.4232
- acc: 0.8441 - auc_roc: 0.62 - ETA: 31s - loss: 0.4234 - acc: 0.8441 - auc_roc:
0.62 - ETA: 30s - loss: 0.4226 - acc: 0.8445 - auc_roc: 0.62 - ETA: 29s - loss:
0.4229 - acc: 0.8442 - auc_roc: 0.63 - ETA: 28s - loss: 0.4225 - acc: 0.8446 -
auc_roc: 0.62 - ETA: 27s - loss: 0.4213 - acc: 0.8452 - auc_roc: 0.62 - ETA: 26s
- loss: 0.4212 - acc: 0.8453 - auc_roc: 0.63 - ETA: 25s - loss: 0.4206 - acc:
0.8455 - auc_roc: 0.63 - ETA: 24s - loss: 0.4193 - acc: 0.8461 - auc_roc: 0.63 -
ETA: 23s - loss: 0.4192 - acc: 0.8461 - auc_roc: 0.63 - ETA: 22s - loss: 0.4201
- acc: 0.8457 - auc_roc: 0.63 - ETA: 21s - loss: 0.4201 - acc: 0.8457 - auc_roc:
0.63 - ETA: 20s - loss: 0.4202 - acc: 0.8455 - auc_roc: 0.63 - ETA: 19s - loss:
0.4199 - acc: 0.8456 - auc_roc: 0.63 - ETA: 18s - loss: 0.4198 - acc: 0.8456 -
auc_roc: 0.63 - ETA: 17s - loss: 0.4201 - acc: 0.8454 - auc_roc: 0.63 - ETA: 16s
- loss: 0.4198 - acc: 0.8454 - auc_roc: 0.63 - ETA: 15s - loss: 0.4199 - acc:
0.8453 - auc_roc: 0.63 - ETA: 14s - loss: 0.4192 - acc: 0.8457 - auc_roc: 0.63 -
ETA: 13s - loss: 0.4187 - acc: 0.8459 - auc_roc: 0.63 - ETA: 12s - loss: 0.4184
- acc: 0.8459 - auc_roc: 0.63 - ETA: 11s - loss: 0.4181 - acc: 0.8459 - auc_roc:
0.63 - ETA: 10s - loss: 0.4178 - acc: 0.8460 - auc_roc: 0.63 - ETA: 9s - loss:
0.4179 - acc: 0.8459 - auc_roc: 0.6366 - ETA: 8s - loss: 0.4183 - acc: 0.8456 -
auc_roc: 0.637 - ETA: 7s - loss: 0.4176 - acc: 0.8460 - auc_roc: 0.636 - ETA: 7s
- loss: 0.4173 - acc: 0.8462 - auc_roc: 0.637 - ETA: 6s - loss: 0.4174 - acc:
```

```
0.8461 - auc_roc: 0.636 - ETA: 5s - loss: 0.4174 - acc: 0.8460 - auc_roc: 0.637
- ETA: 4s - loss: 0.4171 - acc: 0.8462 - auc_roc: 0.637 - ETA: 3s - loss: 0.4173
- acc: 0.8462 - auc_roc: 0.637 - ETA: 2s - loss: 0.4173 - acc: 0.8461 - auc_roc:
0.637 - ETA: 1s - loss: 0.4172 - acc: 0.8462 - auc_roc: 0.637 - ETA: 0s - loss:
0.4170 - acc: 0.8462 - auc_roc: 0.638 - 74s 1ms/step - loss: 0.4168 - acc:
0.8464 - auc_roc: 0.6385 - val_loss: 0.4146 - val_acc: 0.8468 - val_auc_roc:
0.6871

Epoch 00010: val_auc_roc improved from 0.66597 to 0.68707, saving model to
weights-improvement-model2.hdf5
Epoch 11/30
69918/69918 [==============================] - ETA: 1:09 - loss: 0.4208 - acc:
0.8447 - auc_roc: 0.633 - ETA: 1:08 - loss: 0.4361 - acc: 0.8340 - auc_roc:
0.638 - ETA: 1:06 - loss: 0.4243 - acc: 0.8359 - auc_roc: 0.665 - ETA: 1:05 -
loss: 0.4140 - acc: 0.8428 - auc_roc: 0.663 - ETA: 1:05 - loss: 0.4189 - acc:
0.8402 - auc_roc: 0.661 - ETA: 1:03 - loss: 0.4212 - acc: 0.8397 - auc_roc:
0.656 - ETA: 1:03 - loss: 0.4207 - acc: 0.8396 - auc_roc: 0.657 - ETA: 1:01 -
loss: 0.4160 - acc: 0.8427 - auc_roc: 0.656 - ETA: 1:00 - loss: 0.4177 - acc:
0.8422 - auc_roc: 0.655 - ETA: 59s - loss: 0.4183 - acc: 0.8420 - auc_roc: 0.655
- ETA: 59s - loss: 0.4165 - acc: 0.8426 - auc_roc: 0.65 - ETA: 57s - loss:
0.4122 - acc: 0.8443 - auc_roc: 0.66 - ETA: 56s - loss: 0.4114 - acc: 0.8454 -
auc_roc: 0.65 - ETA: 55s - loss: 0.4115 - acc: 0.8457 - auc_roc: 0.65 - ETA: 54s
- loss: 0.4126 - acc: 0.8454 - auc_roc: 0.65 - ETA: 53s - loss: 0.4121 - acc:
0.8452 - auc_roc: 0.65 - ETA: 52s - loss: 0.4105 - acc: 0.8461 - auc_roc: 0.65 -
ETA: 51s - loss: 0.4105 - acc: 0.8459 - auc_roc: 0.65 - ETA: 50s - loss: 0.4087
- acc: 0.8466 - auc_roc: 0.66 - ETA: 49s - loss: 0.4087 - acc: 0.8471 - auc_roc:
0.66 - ETA: 48s - loss: 0.4090 - acc: 0.8471 - auc_roc: 0.66 - ETA: 46s - loss:
0.4084 - acc: 0.8476 - auc_roc: 0.65 - ETA: 45s - loss: 0.4091 - acc: 0.8471 -
auc_roc: 0.65 - ETA: 44s - loss: 0.4098 - acc: 0.8464 - auc_roc: 0.66 - ETA: 43s
- loss: 0.4092 - acc: 0.8470 - auc_roc: 0.65 - ETA: 42s - loss: 0.4076 - acc:
0.8477 - auc_roc: 0.66 - ETA: 41s - loss: 0.4069 - acc: 0.8478 - auc_roc: 0.66 -
ETA: 40s - loss: 0.4064 - acc: 0.8480 - auc_roc: 0.66 - ETA: 39s - loss: 0.4061
- acc: 0.8480 - auc_roc: 0.66 - ETA: 38s - loss: 0.4067 - acc: 0.8479 - auc_roc:
0.66 - ETA: 37s - loss: 0.4069 - acc: 0.8478 - auc_roc: 0.66 - ETA: 36s - loss:
0.4079 - acc: 0.8472 - auc_roc: 0.66 - ETA: 35s - loss: 0.4078 - acc: 0.8474 -
auc_roc: 0.66 - ETA: 34s - loss: 0.4073 - acc: 0.8475 - auc_roc: 0.66 - ETA: 33s
- loss: 0.4081 - acc: 0.8471 - auc_roc: 0.66 - ETA: 32s - loss: 0.4090 - acc:
0.8465 - auc_roc: 0.66 - ETA: 31s - loss: 0.4088 - acc: 0.8468 - auc_roc: 0.66 -
ETA: 30s - loss: 0.4082 - acc: 0.8471 - auc_roc: 0.66 - ETA: 29s - loss: 0.4083
- acc: 0.8470 - auc_roc: 0.66 - ETA: 28s - loss: 0.4081 - acc: 0.8470 - auc_roc:
0.66 - ETA: 27s - loss: 0.4073 - acc: 0.8473 - auc_roc: 0.66 - ETA: 26s - loss:
0.4075 - acc: 0.8472 - auc_roc: 0.66 - ETA: 25s - loss: 0.4081 - acc: 0.8470 -
auc_roc: 0.66 - ETA: 23s - loss: 0.4076 - acc: 0.8472 - auc_roc: 0.66 - ETA: 22s
- loss: 0.4083 - acc: 0.8470 - auc_roc: 0.66 - ETA: 21s - loss: 0.4083 - acc:
0.8467 - auc_roc: 0.66 - ETA: 20s - loss: 0.4078 - acc: 0.8468 - auc_roc: 0.66 -
ETA: 19s - loss: 0.4078 - acc: 0.8467 - auc_roc: 0.66 - ETA: 18s - loss: 0.4076
- acc: 0.8468 - auc_roc: 0.66 - ETA: 17s - loss: 0.4075 - acc: 0.8469 - auc_roc:
0.66 - ETA: 16s - loss: 0.4069 - acc: 0.8471 - auc_roc: 0.66 - ETA: 15s - loss:
```

```
0.4068 - acc: 0.8471 - auc_roc: 0.66 - ETA: 14s - loss: 0.4066 - acc: 0.8474 -
auc_roc: 0.66 - ETA: 13s - loss: 0.4065 - acc: 0.8473 - auc_roc: 0.66 - ETA: 12s
- loss: 0.4069 - acc: 0.8470 - auc_roc: 0.66 - ETA: 11s - loss: 0.4070 - acc:
0.8468 - auc_roc: 0.66 - ETA: 10s - loss: 0.4069 - acc: 0.8469 - auc_roc: 0.66 -
ETA: 9s - loss: 0.4067 - acc: 0.8469 - auc_roc: 0.6682 - ETA: 8s - loss: 0.4070
- acc: 0.8468 - auc_roc: 0.667 - ETA: 7s - loss: 0.4072 - acc: 0.8466 - auc_roc:
0.667 - ETA: 6s - loss: 0.4064 - acc: 0.8470 - auc_roc: 0.668 - ETA: 5s - loss:
0.4067 - acc: 0.8467 - auc_roc: 0.668 - ETA: 5s - loss: 0.4066 - acc: 0.8469 -
auc_roc: 0.668 - ETA: 4s - loss: 0.4068 - acc: 0.8468 - auc_roc: 0.668 - ETA: 3s
- loss: 0.4069 - acc: 0.8467 - auc_roc: 0.668 - ETA: 2s - loss: 0.4068 - acc:
0.8467 - auc_roc: 0.668 - ETA: 1s - loss: 0.4069 - acc: 0.8465 - auc_roc: 0.668
- ETA: 0s - loss: 0.4072 - acc: 0.8462 - auc_roc: 0.668 - 72s 1ms/step - loss:
0.4073 - acc: 0.8461 - auc_roc: 0.6689 - val_loss: 0.4034 - val_acc: 0.8468 -
val_auc_roc: 0.7016

Epoch 00011: val_auc_roc improved from 0.68707 to 0.70163, saving model to
weights-improvement-model2.hdf5
Epoch 12/30
69918/69918 [==============================] - ETA: 1:03 - loss: 0.4095 - acc:
0.8506 - auc_roc: 0.656 - ETA: 1:01 - loss: 0.4084 - acc: 0.8457 - auc_roc:
0.673 - ETA: 1:00 - loss: 0.4139 - acc: 0.8408 - auc_roc: 0.673 - ETA: 59s -
loss: 0.4097 - acc: 0.8447 - auc_roc: 0.670 - ETA: 58s - loss: 0.4136 - acc:
0.8432 - auc_roc: 0.66 - ETA: 58s - loss: 0.4127 - acc: 0.8429 - auc_roc: 0.66 -
ETA: 57s - loss: 0.4127 - acc: 0.8429 - auc_roc: 0.66 - ETA: 55s - loss: 0.4097
- acc: 0.8439 - auc_roc: 0.67 - ETA: 54s - loss: 0.4042 - acc: 0.8472 - auc_roc:
0.67 - ETA: 53s - loss: 0.4032 - acc: 0.8470 - auc_roc: 0.67 - ETA: 52s - loss:
0.4084 - acc: 0.8447 - auc_roc: 0.67 - ETA: 51s - loss: 0.4106 - acc: 0.8442 -
auc_roc: 0.67 - ETA: 51s - loss: 0.4097 - acc: 0.8444 - auc_roc: 0.67 - ETA: 50s
- loss: 0.4112 - acc: 0.8432 - auc_roc: 0.67 - ETA: 49s - loss: 0.4116 - acc:
0.8430 - auc_roc: 0.67 - ETA: 48s - loss: 0.4110 - acc: 0.8427 - auc_roc: 0.67 -
ETA: 47s - loss: 0.4111 - acc: 0.8424 - auc_roc: 0.67 - ETA: 46s - loss: 0.4097
- acc: 0.8434 - auc_roc: 0.67 - ETA: 45s - loss: 0.4082 - acc: 0.8440 - auc_roc:
0.68 - ETA: 44s - loss: 0.4093 - acc: 0.8437 - auc_roc: 0.67 - ETA: 43s - loss:
0.4085 - acc: 0.8438 - auc_roc: 0.68 - ETA: 42s - loss: 0.4080 - acc: 0.8441 -
auc_roc: 0.67 - ETA: 42s - loss: 0.4074 - acc: 0.8446 - auc_roc: 0.67 - ETA: 41s
- loss: 0.4074 - acc: 0.8446 - auc_roc: 0.67 - ETA: 40s - loss: 0.4072 - acc:
0.8447 - auc_roc: 0.67 - ETA: 39s - loss: 0.4065 - acc: 0.8450 - auc_roc: 0.68 -
ETA: 39s - loss: 0.4059 - acc: 0.8456 - auc_roc: 0.67 - ETA: 38s - loss: 0.4060
- acc: 0.8459 - auc_roc: 0.67 - ETA: 37s - loss: 0.4056 - acc: 0.8463 - auc_roc:
0.67 - ETA: 37s - loss: 0.4056 - acc: 0.8462 - auc_roc: 0.67 - ETA: 36s - loss:
0.4060 - acc: 0.8459 - auc_roc: 0.67 - ETA: 35s - loss: 0.4060 - acc: 0.8461 -
auc_roc: 0.67 - ETA: 34s - loss: 0.4064 - acc: 0.8459 - auc_roc: 0.67 - ETA: 34s
- loss: 0.4072 - acc: 0.8454 - auc_roc: 0.67 - ETA: 33s - loss: 0.4070 - acc:
0.8455 - auc_roc: 0.67 - ETA: 32s - loss: 0.4070 - acc: 0.8456 - auc_roc: 0.67 -
ETA: 31s - loss: 0.4067 - acc: 0.8457 - auc_roc: 0.67 - ETA: 30s - loss: 0.4075
- acc: 0.8452 - auc_roc: 0.67 - ETA: 29s - loss: 0.4078 - acc: 0.8449 - auc_roc:
0.67 - ETA: 28s - loss: 0.4081 - acc: 0.8448 - auc_roc: 0.67 - ETA: 27s - loss:
0.4079 - acc: 0.8450 - auc_roc: 0.67 - ETA: 26s - loss: 0.4074 - acc: 0.8451 -
```

```
auc_roc: 0.67 - ETA: 25s - loss: 0.4060 - acc: 0.8458 - auc_roc: 0.67 - ETA: 24s
- loss: 0.4063 - acc: 0.8456 - auc_roc: 0.67 - ETA: 23s - loss: 0.4059 - acc:
0.8458 - auc_roc: 0.67 - ETA: 21s - loss: 0.4061 - acc: 0.8457 - auc_roc: 0.67 -
ETA: 20s - loss: 0.4055 - acc: 0.8460 - auc_roc: 0.67 - ETA: 19s - loss: 0.4055
- acc: 0.8461 - auc_roc: 0.67 - ETA: 18s - loss: 0.4052 - acc: 0.8461 - auc_roc:
0.67 - ETA: 17s - loss: 0.4052 - acc: 0.8461 - auc_roc: 0.67 - ETA: 16s - loss:
0.4051 - acc: 0.8461 - auc_roc: 0.67 - ETA: 15s - loss: 0.4054 - acc: 0.8459 -
auc_roc: 0.67 - ETA: 14s - loss: 0.4053 - acc: 0.8458 - auc_roc: 0.67 - ETA: 13s
- loss: 0.4056 - acc: 0.8456 - auc_roc: 0.67 - ETA: 12s - loss: 0.4063 - acc:
0.8453 - auc_roc: 0.67 - ETA: 11s - loss: 0.4063 - acc: 0.8453 - auc_roc: 0.67 -
ETA: 10s - loss: 0.4063 - acc: 0.8454 - auc_roc: 0.67 - ETA: 9s - loss: 0.4058 -
acc: 0.8457 - auc_roc: 0.6776 - ETA: 8s - loss: 0.4057 - acc: 0.8457 - auc_roc:
0.677 - ETA: 7s - loss: 0.4056 - acc: 0.8458 - auc_roc: 0.677 - ETA: 6s - loss:
0.4053 - acc: 0.8459 - auc_roc: 0.677 - ETA: 6s - loss: 0.4053 - acc: 0.8459 -
auc_roc: 0.677 - ETA: 5s - loss: 0.4051 - acc: 0.8460 - auc_roc: 0.677 - ETA: 4s
- loss: 0.4050 - acc: 0.8462 - auc_roc: 0.677 - ETA: 3s - loss: 0.4052 - acc:
0.8460 - auc_roc: 0.678 - ETA: 2s - loss: 0.4046 - acc: 0.8463 - auc_roc: 0.678
- ETA: 1s - loss: 0.4045 - acc: 0.8464 - auc_roc: 0.678 - ETA: 0s - loss: 0.4048
- acc: 0.8463 - auc_roc: 0.678 - 72s 1ms/step - loss: 0.4048 - acc: 0.8462 -
auc_roc: 0.6785 - val_loss: 0.3940 - val_acc: 0.8468 - val_auc_roc: 0.7103

Epoch 00012: val_auc_roc improved from 0.70163 to 0.71028, saving model to
weights-improvement-model2.hdf5
Epoch 13/30
69918/69918 [==============================] - ETA: 57s - loss: 0.3761 - acc:
0.8594 - auc_roc: 0.70 - ETA: 58s - loss: 0.3621 - acc: 0.8623 - auc_roc: 0.73 -
ETA: 58s - loss: 0.3767 - acc: 0.8551 - auc_roc: 0.72 - ETA: 57s - loss: 0.3784
- acc: 0.8564 - auc_roc: 0.71 - ETA: 56s - loss: 0.3753 - acc: 0.8580 - auc_roc:
0.71 - ETA: 56s - loss: 0.3777 - acc: 0.8560 - auc_roc: 0.71 - ETA: 55s - loss:
0.3802 - acc: 0.8552 - auc_roc: 0.70 - ETA: 55s - loss: 0.3834 - acc: 0.8538 -
auc_roc: 0.70 - ETA: 54s - loss: 0.3876 - acc: 0.8513 - auc_roc: 0.70 - ETA: 54s
- loss: 0.3924 - acc: 0.8490 - auc_roc: 0.69 - ETA: 53s - loss: 0.3940 - acc:
0.8481 - auc_roc: 0.69 - ETA: 53s - loss: 0.3950 - acc: 0.8485 - auc_roc: 0.69 -
ETA: 52s - loss: 0.3929 - acc: 0.8492 - auc_roc: 0.69 - ETA: 51s - loss: 0.3926
- acc: 0.8493 - auc_roc: 0.69 - ETA: 50s - loss: 0.3924 - acc: 0.8495 - auc_roc:
0.69 - ETA: 49s - loss: 0.3924 - acc: 0.8491 - auc_roc: 0.69 - ETA: 48s - loss:
0.3912 - acc: 0.8494 - auc_roc: 0.69 - ETA: 47s - loss: 0.3931 - acc: 0.8483 -
auc_roc: 0.69 - ETA: 46s - loss: 0.3921 - acc: 0.8490 - auc_roc: 0.69 - ETA: 45s
- loss: 0.3918 - acc: 0.8488 - auc_roc: 0.70 - ETA: 44s - loss: 0.3916 - acc:
0.8491 - auc_roc: 0.70 - ETA: 43s - loss: 0.3926 - acc: 0.8485 - auc_roc: 0.69 -
ETA: 42s - loss: 0.3929 - acc: 0.8484 - auc_roc: 0.69 - ETA: 42s - loss: 0.3928
- acc: 0.8486 - auc_roc: 0.69 - ETA: 41s - loss: 0.3931 - acc: 0.8483 - auc_roc:
0.69 - ETA: 40s - loss: 0.3950 - acc: 0.8480 - auc_roc: 0.69 - ETA: 39s - loss:
0.3956 - acc: 0.8474 - auc_roc: 0.69 - ETA: 38s - loss: 0.3967 - acc: 0.8469 -
auc_roc: 0.69 - ETA: 37s - loss: 0.3970 - acc: 0.8466 - auc_roc: 0.69 - ETA: 36s
- loss: 0.3975 - acc: 0.8463 - auc_roc: 0.69 - ETA: 35s - loss: 0.3966 - acc:
0.8470 - auc_roc: 0.69 - ETA: 34s - loss: 0.3960 - acc: 0.8472 - auc_roc: 0.69 -
ETA: 33s - loss: 0.3957 - acc: 0.8477 - auc_roc: 0.69 - ETA: 32s - loss: 0.3962
```

- acc: 0.8474 - auc_roc: 0.69 - ETA: 31s - loss: 0.3975 - acc: 0.8466 - auc_roc:
0.69 - ETA: 30s - loss: 0.3972 - acc: 0.8468 - auc_roc: 0.69 - ETA: 29s - loss:
0.3967 - acc: 0.8470 - auc_roc: 0.69 - ETA: 29s - loss: 0.3952 - acc: 0.8478 -
auc_roc: 0.69 - ETA: 28s - loss: 0.3956 - acc: 0.8477 - auc_roc: 0.69 - ETA: 27s
- loss: 0.3957 - acc: 0.8478 - auc_roc: 0.69 - ETA: 26s - loss: 0.3960 - acc:
0.8476 - auc_roc: 0.69 - ETA: 25s - loss: 0.3967 - acc: 0.8471 - auc_roc: 0.69 -
ETA: 24s - loss: 0.3972 - acc: 0.8470 - auc_roc: 0.69 - ETA: 23s - loss: 0.3977
- acc: 0.8470 - auc_roc: 0.69 - ETA: 22s - loss: 0.3982 - acc: 0.8469 - auc_roc:
0.69 - ETA: 21s - loss: 0.3981 - acc: 0.8468 - auc_roc: 0.69 - ETA: 20s - loss:
0.3977 - acc: 0.8471 - auc_roc: 0.69 - ETA: 19s - loss: 0.3979 - acc: 0.8470 -
auc_roc: 0.69 - ETA: 18s - loss: 0.3981 - acc: 0.8469 - auc_roc: 0.69 - ETA: 17s
- loss: 0.3983 - acc: 0.8468 - auc_roc: 0.69 - ETA: 16s - loss: 0.3985 - acc:
0.8468 - auc_roc: 0.69 - ETA: 15s - loss: 0.3984 - acc: 0.8470 - auc_roc: 0.69 -
ETA: 14s - loss: 0.3984 - acc: 0.8469 - auc_roc: 0.69 - ETA: 13s - loss: 0.3984
- acc: 0.8469 - auc_roc: 0.69 - ETA: 12s - loss: 0.3977 - acc: 0.8472 - auc_roc:
0.69 - ETA: 11s - loss: 0.3981 - acc: 0.8471 - auc_roc: 0.69 - ETA: 10s - loss:
0.3982 - acc: 0.8469 - auc_roc: 0.69 - ETA: 9s - loss: 0.3981 - acc: 0.8470 -
auc_roc: 0.6918 - ETA: 8s - loss: 0.3979 - acc: 0.8472 - auc_roc: 0.691 - ETA:
7s - loss: 0.3976 - acc: 0.8473 - auc_roc: 0.691 - ETA: 6s - loss: 0.3973 - acc:
0.8474 - auc_roc: 0.692 - ETA: 6s - loss: 0.3974 - acc: 0.8472 - auc_roc: 0.692
- ETA: 5s - loss: 0.3974 - acc: 0.8472 - auc_roc: 0.692 - ETA: 4s - loss: 0.3972
- acc: 0.8473 - auc_roc: 0.692 - ETA: 3s - loss: 0.3972 - acc: 0.8474 - auc_roc:
0.692 - ETA: 2s - loss: 0.3977 - acc: 0.8470 - auc_roc: 0.692 - ETA: 1s - loss:
0.3982 - acc: 0.8467 - auc_roc: 0.692 - ETA: 0s - loss: 0.3982 - acc: 0.8466 -
auc_roc: 0.692 - 73s 1ms/step - loss: 0.3982 - acc: 0.8466 - auc_roc: 0.6925 -
val_loss: 0.3985 - val_acc: 0.8455 - val_auc_roc: 0.7134

Epoch 00013: val_auc_roc improved from 0.71028 to 0.71342, saving model to
weights-improvement-model2.hdf5
Epoch 14/30
69918/69918 [==============================] - ETA: 1:01 - loss: 0.4202 - acc:
0.8398 - auc_roc: 0.685 - ETA: 59s - loss: 0.4128 - acc: 0.8374 - auc_roc: 0.696
- ETA: 57s - loss: 0.4078 - acc: 0.8405 - auc_roc: 0.69 - ETA: 57s - loss:
0.4125 - acc: 0.8374 - auc_roc: 0.68 - ETA: 56s - loss: 0.4050 - acc: 0.8412 -
auc_roc: 0.69 - ETA: 55s - loss: 0.4070 - acc: 0.8392 - auc_roc: 0.69 - ETA: 54s
- loss: 0.4053 - acc: 0.8404 - auc_roc: 0.69 - ETA: 54s - loss: 0.4057 - acc:
0.8403 - auc_roc: 0.69 - ETA: 53s - loss: 0.4103 - acc: 0.8385 - auc_roc: 0.69 -
ETA: 53s - loss: 0.4120 - acc: 0.8370 - auc_roc: 0.69 - ETA: 53s - loss: 0.4126
- acc: 0.8371 - auc_roc: 0.69 - ETA: 52s - loss: 0.4114 - acc: 0.8381 - auc_roc:
0.69 - ETA: 51s - loss: 0.4094 - acc: 0.8395 - auc_roc: 0.68 - ETA: 50s - loss:
0.4084 - acc: 0.8404 - auc_roc: 0.68 - ETA: 49s - loss: 0.4071 - acc: 0.8411 -
auc_roc: 0.68 - ETA: 48s - loss: 0.4044 - acc: 0.8423 - auc_roc: 0.69 - ETA: 47s
- loss: 0.4012 - acc: 0.8440 - auc_roc: 0.69 - ETA: 46s - loss: 0.4001 - acc:
0.8445 - auc_roc: 0.69 - ETA: 46s - loss: 0.4010 - acc: 0.8446 - auc_roc: 0.68 -
ETA: 45s - loss: 0.3991 - acc: 0.8458 - auc_roc: 0.68 - ETA: 44s - loss: 0.4005
- acc: 0.8451 - auc_roc: 0.68 - ETA: 43s - loss: 0.4013 - acc: 0.8448 - auc_roc:
0.68 - ETA: 42s - loss: 0.4025 - acc: 0.8443 - auc_roc: 0.68 - ETA: 41s - loss:
0.4023 - acc: 0.8445 - auc_roc: 0.68 - ETA: 40s - loss: 0.4019 - acc: 0.8446 -

```
auc_roc: 0.68 - ETA: 39s - loss: 0.4017 - acc: 0.8447 - auc_roc: 0.68 - ETA: 38s
- loss: 0.4019 - acc: 0.8447 - auc_roc: 0.68 - ETA: 38s - loss: 0.4020 - acc:
0.8442 - auc_roc: 0.68 - ETA: 37s - loss: 0.4020 - acc: 0.8442 - auc_roc: 0.68 -
ETA: 36s - loss: 0.4021 - acc: 0.8440 - auc_roc: 0.68 - ETA: 35s - loss: 0.4008
- acc: 0.8448 - auc_roc: 0.68 - ETA: 34s - loss: 0.4007 - acc: 0.8447 - auc_roc:
0.68 - ETA: 33s - loss: 0.4014 - acc: 0.8443 - auc_roc: 0.68 - ETA: 32s - loss:
0.4006 - acc: 0.8446 - auc_roc: 0.68 - ETA: 31s - loss: 0.4002 - acc: 0.8448 -
auc_roc: 0.69 - ETA: 30s - loss: 0.3999 - acc: 0.8452 - auc_roc: 0.68 - ETA: 29s
- loss: 0.3993 - acc: 0.8456 - auc_roc: 0.69 - ETA: 28s - loss: 0.3984 - acc:
0.8458 - auc_roc: 0.69 - ETA: 27s - loss: 0.3974 - acc: 0.8464 - auc_roc: 0.69 -
ETA: 26s - loss: 0.3981 - acc: 0.8461 - auc_roc: 0.69 - ETA: 25s - loss: 0.3983
- acc: 0.8460 - auc_roc: 0.69 - ETA: 24s - loss: 0.3969 - acc: 0.8468 - auc_roc:
0.69 - ETA: 24s - loss: 0.3973 - acc: 0.8468 - auc_roc: 0.69 - ETA: 23s - loss:
0.3976 - acc: 0.8466 - auc_roc: 0.69 - ETA: 22s - loss: 0.3973 - acc: 0.8466 -
auc_roc: 0.69 - ETA: 21s - loss: 0.3978 - acc: 0.8463 - auc_roc: 0.69 - ETA: 20s
- loss: 0.3972 - acc: 0.8463 - auc_roc: 0.69 - ETA: 19s - loss: 0.3966 - acc:
0.8467 - auc_roc: 0.69 - ETA: 18s - loss: 0.3970 - acc: 0.8464 - auc_roc: 0.69 -
ETA: 17s - loss: 0.3971 - acc: 0.8464 - auc_roc: 0.69 - ETA: 16s - loss: 0.3971
- acc: 0.8461 - auc_roc: 0.69 - ETA: 15s - loss: 0.3972 - acc: 0.8460 - auc_roc:
0.69 - ETA: 14s - loss: 0.3975 - acc: 0.8456 - auc_roc: 0.69 - ETA: 13s - loss:
0.3974 - acc: 0.8458 - auc_roc: 0.69 - ETA: 12s - loss: 0.3979 - acc: 0.8455 -
auc_roc: 0.69 - ETA: 11s - loss: 0.3973 - acc: 0.8456 - auc_roc: 0.69 - ETA: 10s
- loss: 0.3970 - acc: 0.8459 - auc_roc: 0.69 - ETA: 9s - loss: 0.3972 - acc:
0.8457 - auc_roc: 0.6967 - ETA: 8s - loss: 0.3968 - acc: 0.8458 - auc_roc: 0.697
- ETA: 8s - loss: 0.3969 - acc: 0.8456 - auc_roc: 0.697 - ETA: 7s - loss: 0.3969
- acc: 0.8455 - auc_roc: 0.698 - ETA: 6s - loss: 0.3966 - acc: 0.8457 - auc_roc:
0.698 - ETA: 5s - loss: 0.3959 - acc: 0.8462 - auc_roc: 0.698 - ETA: 4s - loss:
0.3958 - acc: 0.8464 - auc_roc: 0.698 - ETA: 3s - loss: 0.3957 - acc: 0.8463 -
auc_roc: 0.698 - ETA: 2s - loss: 0.3958 - acc: 0.8462 - auc_roc: 0.698 - ETA: 1s
- loss: 0.3955 - acc: 0.8463 - auc_roc: 0.699 - ETA: 0s - loss: 0.3951 - acc:
0.8466 - auc_roc: 0.699 - 74s 1ms/step - loss: 0.3952 - acc: 0.8465 - auc_roc:
0.6992 - val_loss: 0.3852 - val_acc: 0.8468 - val_auc_roc: 0.7251

Epoch 00014: val_auc_roc improved from 0.71342 to 0.72506, saving model to
weights-improvement-model2.hdf5
Epoch 15/30
69918/69918 [==============================] - ETA: 58s - loss: 0.4156 - acc:
0.8428 - auc_roc: 0.66 - ETA: 58s - loss: 0.4047 - acc: 0.8447 - auc_roc: 0.69 -
ETA: 57s - loss: 0.4016 - acc: 0.8428 - auc_roc: 0.70 - ETA: 56s - loss: 0.3984
- acc: 0.8420 - auc_roc: 0.71 - ETA: 56s - loss: 0.3982 - acc: 0.8424 - auc_roc:
0.71 - ETA: 55s - loss: 0.3953 - acc: 0.8433 - auc_roc: 0.71 - ETA: 54s - loss:
0.3977 - acc: 0.8403 - auc_roc: 0.71 - ETA: 53s - loss: 0.4011 - acc: 0.8398 -
auc_roc: 0.71 - ETA: 52s - loss: 0.4040 - acc: 0.8397 - auc_roc: 0.70 - ETA: 51s
- loss: 0.4061 - acc: 0.8385 - auc_roc: 0.70 - ETA: 50s - loss: 0.4053 - acc:
0.8402 - auc_roc: 0.69 - ETA: 49s - loss: 0.4047 - acc: 0.8409 - auc_roc: 0.69 -
ETA: 48s - loss: 0.4031 - acc: 0.8423 - auc_roc: 0.69 - ETA: 47s - loss: 0.4019
- acc: 0.8428 - auc_roc: 0.69 - ETA: 46s - loss: 0.4024 - acc: 0.8425 - auc_roc:
0.69 - ETA: 46s - loss: 0.4012 - acc: 0.8425 - auc_roc: 0.69 - ETA: 45s - loss:
```

```
0.4014 - acc: 0.8427 - auc_roc: 0.69 - ETA: 44s - loss: 0.4010 - acc: 0.8427 -
auc_roc: 0.70 - ETA: 43s - loss: 0.3997 - acc: 0.8433 - auc_roc: 0.70 - ETA: 42s
- loss: 0.3995 - acc: 0.8435 - auc_roc: 0.70 - ETA: 42s - loss: 0.3995 - acc:
0.8438 - auc_roc: 0.69 - ETA: 41s - loss: 0.3979 - acc: 0.8442 - auc_roc: 0.70 -
ETA: 40s - loss: 0.3972 - acc: 0.8447 - auc_roc: 0.70 - ETA: 39s - loss: 0.3989
- acc: 0.8439 - auc_roc: 0.69 - ETA: 38s - loss: 0.3990 - acc: 0.8440 - auc_roc:
0.69 - ETA: 37s - loss: 0.3976 - acc: 0.8446 - auc_roc: 0.70 - ETA: 36s - loss:
0.3965 - acc: 0.8449 - auc_roc: 0.70 - ETA: 35s - loss: 0.3962 - acc: 0.8452 -
auc_roc: 0.70 - ETA: 35s - loss: 0.3963 - acc: 0.8448 - auc_roc: 0.70 - ETA: 34s
- loss: 0.3969 - acc: 0.8447 - auc_roc: 0.70 - ETA: 33s - loss: 0.3977 - acc:
0.8442 - auc_roc: 0.70 - ETA: 32s - loss: 0.3971 - acc: 0.8440 - auc_roc: 0.70 -
ETA: 31s - loss: 0.3961 - acc: 0.8443 - auc_roc: 0.70 - ETA: 30s - loss: 0.3946
- acc: 0.8453 - auc_roc: 0.70 - ETA: 29s - loss: 0.3941 - acc: 0.8458 - auc_roc:
0.70 - ETA: 28s - loss: 0.3934 - acc: 0.8462 - auc_roc: 0.70 - ETA: 27s - loss:
0.3936 - acc: 0.8460 - auc_roc: 0.70 - ETA: 26s - loss: 0.3936 - acc: 0.8461 -
auc_roc: 0.70 - ETA: 25s - loss: 0.3932 - acc: 0.8463 - auc_roc: 0.70 - ETA: 24s
- loss: 0.3930 - acc: 0.8463 - auc_roc: 0.70 - ETA: 24s - loss: 0.3932 - acc:
0.8460 - auc_roc: 0.70 - ETA: 23s - loss: 0.3935 - acc: 0.8458 - auc_roc: 0.70 -
ETA: 22s - loss: 0.3928 - acc: 0.8460 - auc_roc: 0.70 - ETA: 21s - loss: 0.3925
- acc: 0.8461 - auc_roc: 0.70 - ETA: 20s - loss: 0.3924 - acc: 0.8462 - auc_roc:
0.70 - ETA: 19s - loss: 0.3920 - acc: 0.8465 - auc_roc: 0.70 - ETA: 18s - loss:
0.3916 - acc: 0.8467 - auc_roc: 0.70 - ETA: 17s - loss: 0.3921 - acc: 0.8466 -
auc_roc: 0.70 - ETA: 17s - loss: 0.3923 - acc: 0.8465 - auc_roc: 0.70 - ETA: 16s
- loss: 0.3924 - acc: 0.8465 - auc_roc: 0.70 - ETA: 15s - loss: 0.3928 - acc:
0.8462 - auc_roc: 0.70 - ETA: 14s - loss: 0.3927 - acc: 0.8463 - auc_roc: 0.70 -
ETA: 13s - loss: 0.3927 - acc: 0.8464 - auc_roc: 0.70 - ETA: 12s - loss: 0.3931
- acc: 0.8460 - auc_roc: 0.70 - ETA: 11s - loss: 0.3926 - acc: 0.8463 - auc_roc:
0.70 - ETA: 10s - loss: 0.3927 - acc: 0.8461 - auc_roc: 0.70 - ETA: 10s - loss:
0.3919 - acc: 0.8465 - auc_roc: 0.70 - ETA: 9s - loss: 0.3918 - acc: 0.8467 -
auc_roc: 0.7087 - ETA: 8s - loss: 0.3926 - acc: 0.8463 - auc_roc: 0.708 - ETA:
7s - loss: 0.3924 - acc: 0.8463 - auc_roc: 0.708 - ETA: 6s - loss: 0.3920 - acc:
0.8465 - auc_roc: 0.708 - ETA: 5s - loss: 0.3920 - acc: 0.8466 - auc_roc: 0.708
- ETA: 4s - loss: 0.3919 - acc: 0.8467 - auc_roc: 0.708 - ETA: 3s - loss: 0.3917
- acc: 0.8468 - auc_roc: 0.708 - ETA: 2s - loss: 0.3911 - acc: 0.8470 - auc_roc:
0.709 - ETA: 2s - loss: 0.3909 - acc: 0.8472 - auc_roc: 0.708 - ETA: 1s - loss:
0.3908 - acc: 0.8474 - auc_roc: 0.708 - ETA: 0s - loss: 0.3908 - acc: 0.8474 -
auc_roc: 0.708 - 68s 972us/step - loss: 0.3910 - acc: 0.8474 - auc_roc: 0.7083 -
val_loss: 0.3843 - val_acc: 0.8468 - val_auc_roc: 0.7267

Epoch 00015: val_auc_roc improved from 0.72506 to 0.72666, saving model to
weights-improvement-model2.hdf5
Epoch 16/30
69918/69918 [==============================] - ETA: 1:00 - loss: 0.3539 - acc:
0.8633 - auc_roc: 0.727 - ETA: 59s - loss: 0.3580 - acc: 0.8604 - auc_roc: 0.733
- ETA: 59s - loss: 0.3612 - acc: 0.8597 - auc_roc: 0.73 - ETA: 58s - loss:
0.3679 - acc: 0.8560 - auc_roc: 0.72 - ETA: 56s - loss: 0.3691 - acc: 0.8559 -
auc_roc: 0.72 - ETA: 57s - loss: 0.3712 - acc: 0.8550 - auc_roc: 0.72 - ETA: 57s
- loss: 0.3710 - acc: 0.8545 - auc_roc: 0.72 - ETA: 56s - loss: 0.3788 - acc:
```

```
0.8507 - auc_roc: 0.72 - ETA: 55s - loss: 0.3799 - acc: 0.8500 - auc_roc: 0.71 -
ETA: 53s - loss: 0.3802 - acc: 0.8497 - auc_roc: 0.71 - ETA: 53s - loss: 0.3801
- acc: 0.8507 - auc_roc: 0.72 - ETA: 52s - loss: 0.3813 - acc: 0.8506 - auc_roc:
0.72 - ETA: 51s - loss: 0.3802 - acc: 0.8511 - auc_roc: 0.72 - ETA: 50s - loss:
0.3826 - acc: 0.8503 - auc_roc: 0.71 - ETA: 49s - loss: 0.3827 - acc: 0.8501 -
auc_roc: 0.71 - ETA: 49s - loss: 0.3827 - acc: 0.8502 - auc_roc: 0.71 - ETA: 48s
- loss: 0.3835 - acc: 0.8498 - auc_roc: 0.71 - ETA: 47s - loss: 0.3827 - acc:
0.8503 - auc_roc: 0.71 - ETA: 46s - loss: 0.3837 - acc: 0.8502 - auc_roc: 0.71 -
ETA: 45s - loss: 0.3839 - acc: 0.8503 - auc_roc: 0.71 - ETA: 44s - loss: 0.3847
- acc: 0.8496 - auc_roc: 0.71 - ETA: 43s - loss: 0.3853 - acc: 0.8490 - auc_roc:
0.71 - ETA: 42s - loss: 0.3858 - acc: 0.8489 - auc_roc: 0.71 - ETA: 41s - loss:
0.3859 - acc: 0.8488 - auc_roc: 0.71 - ETA: 40s - loss: 0.3850 - acc: 0.8495 -
auc_roc: 0.71 - ETA: 39s - loss: 0.3862 - acc: 0.8488 - auc_roc: 0.71 - ETA: 38s
- loss: 0.3864 - acc: 0.8488 - auc_roc: 0.71 - ETA: 37s - loss: 0.3873 - acc:
0.8483 - auc_roc: 0.71 - ETA: 36s - loss: 0.3876 - acc: 0.8480 - auc_roc: 0.71 -
ETA: 35s - loss: 0.3884 - acc: 0.8478 - auc_roc: 0.71 - ETA: 34s - loss: 0.3884
- acc: 0.8477 - auc_roc: 0.71 - ETA: 33s - loss: 0.3893 - acc: 0.8474 - auc_roc:
0.71 - ETA: 32s - loss: 0.3900 - acc: 0.8471 - auc_roc: 0.71 - ETA: 31s - loss:
0.3902 - acc: 0.8469 - auc_roc: 0.71 - ETA: 30s - loss: 0.3901 - acc: 0.8470 -
auc_roc: 0.71 - ETA: 30s - loss: 0.3904 - acc: 0.8469 - auc_roc: 0.71 - ETA: 29s
- loss: 0.3900 - acc: 0.8471 - auc_roc: 0.71 - ETA: 28s - loss: 0.3898 - acc:
0.8471 - auc_roc: 0.71 - ETA: 27s - loss: 0.3897 - acc: 0.8474 - auc_roc: 0.71 -
ETA: 26s - loss: 0.3895 - acc: 0.8474 - auc_roc: 0.71 - ETA: 25s - loss: 0.3892
- acc: 0.8475 - auc_roc: 0.71 - ETA: 24s - loss: 0.3883 - acc: 0.8479 - auc_roc:
0.71 - ETA: 23s - loss: 0.3885 - acc: 0.8479 - auc_roc: 0.71 - ETA: 22s - loss:
0.3881 - acc: 0.8481 - auc_roc: 0.71 - ETA: 21s - loss: 0.3879 - acc: 0.8482 -
auc_roc: 0.71 - ETA: 21s - loss: 0.3880 - acc: 0.8481 - auc_roc: 0.71 - ETA: 20s
- loss: 0.3880 - acc: 0.8480 - auc_roc: 0.71 - ETA: 19s - loss: 0.3874 - acc:
0.8481 - auc_roc: 0.71 - ETA: 18s - loss: 0.3874 - acc: 0.8481 - auc_roc: 0.71 -
ETA: 17s - loss: 0.3874 - acc: 0.8481 - auc_roc: 0.71 - ETA: 16s - loss: 0.3872
- acc: 0.8481 - auc_roc: 0.71 - ETA: 15s - loss: 0.3875 - acc: 0.8481 - auc_roc:
0.71 - ETA: 14s - loss: 0.3876 - acc: 0.8481 - auc_roc: 0.71 - ETA: 13s - loss:
0.3881 - acc: 0.8477 - auc_roc: 0.71 - ETA: 12s - loss: 0.3883 - acc: 0.8475 -
auc_roc: 0.71 - ETA: 11s - loss: 0.3885 - acc: 0.8471 - auc_roc: 0.71 - ETA: 10s
- loss: 0.3884 - acc: 0.8473 - auc_roc: 0.71 - ETA: 9s - loss: 0.3879 - acc:
0.8475 - auc_roc: 0.7151 - ETA: 8s - loss: 0.3879 - acc: 0.8475 - auc_roc: 0.715
- ETA: 7s - loss: 0.3877 - acc: 0.8476 - auc_roc: 0.715 - ETA: 6s - loss: 0.3875
- acc: 0.8476 - auc_roc: 0.715 - ETA: 6s - loss: 0.3871 - acc: 0.8477 - auc_roc:
0.716 - ETA: 5s - loss: 0.3874 - acc: 0.8475 - auc_roc: 0.716 - ETA: 4s - loss:
0.3874 - acc: 0.8475 - auc_roc: 0.715 - ETA: 3s - loss: 0.3872 - acc: 0.8478 -
auc_roc: 0.715 - ETA: 2s - loss: 0.3871 - acc: 0.8479 - auc_roc: 0.715 - ETA: 1s
- loss: 0.3873 - acc: 0.8477 - auc_roc: 0.715 - ETA: 0s - loss: 0.3874 - acc:
0.8477 - auc_roc: 0.715 - 72s 1ms/step - loss: 0.3874 - acc: 0.8477 - auc_roc:
0.7151 - val_loss: 0.3858 - val_acc: 0.8468 - val_auc_roc: 0.7301

Epoch 00016: val_auc_roc improved from 0.72666 to 0.73014, saving model to
weights-improvement-model2.hdf5
Epoch 17/30
```

```
69918/69918 [==============================] - ETA: 1:01 - loss: 0.3658 - acc:
0.8525 - auc_roc: 0.737 - ETA: 1:00 - loss: 0.3694 - acc: 0.8550 - auc_roc:
0.728 - ETA: 1:00 - loss: 0.3632 - acc: 0.8581 - auc_roc: 0.735 - ETA: 59s -
loss: 0.3578 - acc: 0.8604 - auc_roc: 0.741 - ETA: 58s - loss: 0.3649 - acc:
0.8580 - auc_roc: 0.72 - ETA: 57s - loss: 0.3682 - acc: 0.8573 - auc_roc: 0.72 -
ETA: 56s - loss: 0.3774 - acc: 0.8530 - auc_roc: 0.71 - ETA: 56s - loss: 0.3799
- acc: 0.8519 - auc_roc: 0.71 - ETA: 55s - loss: 0.3790 - acc: 0.8525 - auc_roc:
0.71 - ETA: 55s - loss: 0.3834 - acc: 0.8512 - auc_roc: 0.71 - ETA: 54s - loss:
0.3834 - acc: 0.8493 - auc_roc: 0.71 - ETA: 54s - loss: 0.3832 - acc: 0.8493 -
auc_roc: 0.71 - ETA: 54s - loss: 0.3843 - acc: 0.8491 - auc_roc: 0.71 - ETA: 53s
- loss: 0.3851 - acc: 0.8488 - auc_roc: 0.71 - ETA: 52s - loss: 0.3880 - acc:
0.8472 - auc_roc: 0.71 - ETA: 51s - loss: 0.3907 - acc: 0.8458 - auc_roc: 0.71 -
ETA: 50s - loss: 0.3901 - acc: 0.8462 - auc_roc: 0.71 - ETA: 49s - loss: 0.3899
- acc: 0.8461 - auc_roc: 0.71 - ETA: 48s - loss: 0.3903 - acc: 0.8457 - auc_roc:
0.71 - ETA: 47s - loss: 0.3900 - acc: 0.8458 - auc_roc: 0.71 - ETA: 47s - loss:
0.3901 - acc: 0.8457 - auc_roc: 0.71 - ETA: 46s - loss: 0.3912 - acc: 0.8450 -
auc_roc: 0.71 - ETA: 45s - loss: 0.3914 - acc: 0.8444 - auc_roc: 0.71 - ETA: 44s
- loss: 0.3910 - acc: 0.8444 - auc_roc: 0.71 - ETA: 43s - loss: 0.3926 - acc:
0.8439 - auc_roc: 0.71 - ETA: 42s - loss: 0.3924 - acc: 0.8442 - auc_roc: 0.71 -
ETA: 41s - loss: 0.3909 - acc: 0.8448 - auc_roc: 0.71 - ETA: 40s - loss: 0.3901
- acc: 0.8452 - auc_roc: 0.71 - ETA: 38s - loss: 0.3892 - acc: 0.8456 - auc_roc:
0.71 - ETA: 37s - loss: 0.3883 - acc: 0.8459 - auc_roc: 0.71 - ETA: 36s - loss:
0.3877 - acc: 0.8464 - auc_roc: 0.71 - ETA: 35s - loss: 0.3865 - acc: 0.8467 -
auc_roc: 0.71 - ETA: 34s - loss: 0.3867 - acc: 0.8465 - auc_roc: 0.71 - ETA: 33s
- loss: 0.3872 - acc: 0.8466 - auc_roc: 0.71 - ETA: 32s - loss: 0.3869 - acc:
0.8465 - auc_roc: 0.71 - ETA: 31s - loss: 0.3874 - acc: 0.8463 - auc_roc: 0.71 -
ETA: 30s - loss: 0.3870 - acc: 0.8466 - auc_roc: 0.71 - ETA: 29s - loss: 0.3869
- acc: 0.8467 - auc_roc: 0.71 - ETA: 28s - loss: 0.3872 - acc: 0.8466 - auc_roc:
0.71 - ETA: 27s - loss: 0.3865 - acc: 0.8469 - auc_roc: 0.71 - ETA: 26s - loss:
0.3858 - acc: 0.8472 - auc_roc: 0.71 - ETA: 25s - loss: 0.3858 - acc: 0.8472 -
auc_roc: 0.71 - ETA: 24s - loss: 0.3862 - acc: 0.8467 - auc_roc: 0.71 - ETA: 23s
- loss: 0.3859 - acc: 0.8470 - auc_roc: 0.71 - ETA: 22s - loss: 0.3857 - acc:
0.8469 - auc_roc: 0.72 - ETA: 21s - loss: 0.3848 - acc: 0.8473 - auc_roc: 0.72 -
ETA: 20s - loss: 0.3852 - acc: 0.8473 - auc_roc: 0.72 - ETA: 19s - loss: 0.3856
- acc: 0.8471 - auc_roc: 0.72 - ETA: 18s - loss: 0.3855 - acc: 0.8472 - auc_roc:
0.72 - ETA: 17s - loss: 0.3860 - acc: 0.8471 - auc_roc: 0.71 - ETA: 16s - loss:
0.3863 - acc: 0.8469 - auc_roc: 0.71 - ETA: 15s - loss: 0.3861 - acc: 0.8469 -
auc_roc: 0.72 - ETA: 14s - loss: 0.3859 - acc: 0.8470 - auc_roc: 0.72 - ETA: 13s
- loss: 0.3860 - acc: 0.8469 - auc_roc: 0.72 - ETA: 12s - loss: 0.3861 - acc:
0.8467 - auc_roc: 0.72 - ETA: 11s - loss: 0.3863 - acc: 0.8466 - auc_roc: 0.72 -
ETA: 10s - loss: 0.3863 - acc: 0.8468 - auc_roc: 0.72 - ETA: 9s - loss: 0.3861 -
acc: 0.8467 - auc_roc: 0.7208 - ETA: 8s - loss: 0.3863 - acc: 0.8466 - auc_roc:
0.720 - ETA: 8s - loss: 0.3864 - acc: 0.8467 - auc_roc: 0.720 - ETA: 7s - loss:
0.3864 - acc: 0.8469 - auc_roc: 0.719 - ETA: 6s - loss: 0.3862 - acc: 0.8470 -
auc_roc: 0.719 - ETA: 5s - loss: 0.3861 - acc: 0.8472 - auc_roc: 0.719 - ETA: 4s
- loss: 0.3858 - acc: 0.8475 - auc_roc: 0.719 - ETA: 3s - loss: 0.3865 - acc:
0.8472 - auc_roc: 0.718 - ETA: 2s - loss: 0.3867 - acc: 0.8472 - auc_roc: 0.717
- ETA: 1s - loss: 0.3863 - acc: 0.8474 - auc_roc: 0.717 - ETA: 0s - loss: 0.3861
```

- acc: 0.8475 - auc_roc: 0.717 - 74s 1ms/step - loss: 0.3862 - acc: 0.8474 -
auc_roc: 0.7176 - val_loss: 0.3920 - val_acc: 0.8438 - val_auc_roc: 0.7206

Epoch 00017: val_auc_roc did not improve from 0.73014
Epoch 18/30
69918/69918 [==============================] - ETA: 59s - loss: 0.3836 - acc:
0.8418 - auc_roc: 0.73 - ETA: 57s - loss: 0.3891 - acc: 0.8408 - auc_roc: 0.71 -
ETA: 57s - loss: 0.3877 - acc: 0.8441 - auc_roc: 0.71 - ETA: 56s - loss: 0.3871
- acc: 0.8455 - auc_roc: 0.71 - ETA: 55s - loss: 0.3825 - acc: 0.8473 - auc_roc:
0.72 - ETA: 55s - loss: 0.3819 - acc: 0.8470 - auc_roc: 0.72 - ETA: 54s - loss:
0.3835 - acc: 0.8457 - auc_roc: 0.72 - ETA: 54s - loss: 0.3856 - acc: 0.8451 -
auc_roc: 0.72 - ETA: 53s - loss: 0.3828 - acc: 0.8478 - auc_roc: 0.72 - ETA: 53s
- loss: 0.3834 - acc: 0.8479 - auc_roc: 0.71 - ETA: 51s - loss: 0.3834 - acc:
0.8470 - auc_roc: 0.72 - ETA: 50s - loss: 0.3841 - acc: 0.8473 - auc_roc: 0.72 -
ETA: 50s - loss: 0.3839 - acc: 0.8476 - auc_roc: 0.72 - ETA: 48s - loss: 0.3837
- acc: 0.8476 - auc_roc: 0.72 - ETA: 47s - loss: 0.3854 - acc: 0.8472 - auc_roc:
0.72 - ETA: 46s - loss: 0.3865 - acc: 0.8466 - auc_roc: 0.72 - ETA: 45s - loss:
0.3852 - acc: 0.8475 - auc_roc: 0.72 - ETA: 44s - loss: 0.3848 - acc: 0.8477 -
auc_roc: 0.72 - ETA: 43s - loss: 0.3864 - acc: 0.8472 - auc_roc: 0.71 - ETA: 42s
- loss: 0.3880 - acc: 0.8469 - auc_roc: 0.71 - ETA: 41s - loss: 0.3874 - acc:
0.8471 - auc_roc: 0.71 - ETA: 40s - loss: 0.3875 - acc: 0.8476 - auc_roc: 0.71 -
ETA: 39s - loss: 0.3864 - acc: 0.8478 - auc_roc: 0.71 - ETA: 38s - loss: 0.3863
- acc: 0.8473 - auc_roc: 0.71 - ETA: 38s - loss: 0.3859 - acc: 0.8475 - auc_roc:
0.71 - ETA: 37s - loss: 0.3856 - acc: 0.8478 - auc_roc: 0.71 - ETA: 36s - loss:
0.3852 - acc: 0.8479 - auc_roc: 0.71 - ETA: 35s - loss: 0.3848 - acc: 0.8481 -
auc_roc: 0.71 - ETA: 34s - loss: 0.3842 - acc: 0.8483 - auc_roc: 0.72 - ETA: 33s
- loss: 0.3845 - acc: 0.8483 - auc_roc: 0.72 - ETA: 32s - loss: 0.3840 - acc:
0.8484 - auc_roc: 0.72 - ETA: 31s - loss: 0.3843 - acc: 0.8481 - auc_roc: 0.72 -
ETA: 31s - loss: 0.3848 - acc: 0.8478 - auc_roc: 0.71 - ETA: 30s - loss: 0.3846
- acc: 0.8480 - auc_roc: 0.71 - ETA: 29s - loss: 0.3850 - acc: 0.8477 - auc_roc:
0.71 - ETA: 28s - loss: 0.3853 - acc: 0.8478 - auc_roc: 0.71 - ETA: 27s - loss:
0.3851 - acc: 0.8477 - auc_roc: 0.71 - ETA: 26s - loss: 0.3851 - acc: 0.8473 -
auc_roc: 0.72 - ETA: 25s - loss: 0.3855 - acc: 0.8469 - auc_roc: 0.72 - ETA: 24s
- loss: 0.3852 - acc: 0.8470 - auc_roc: 0.72 - ETA: 24s - loss: 0.3856 - acc:
0.8468 - auc_roc: 0.72 - ETA: 23s - loss: 0.3852 - acc: 0.8471 - auc_roc: 0.72 -
ETA: 22s - loss: 0.3847 - acc: 0.8472 - auc_roc: 0.72 - ETA: 21s - loss: 0.3847
- acc: 0.8473 - auc_roc: 0.72 - ETA: 20s - loss: 0.3847 - acc: 0.8471 - auc_roc:
0.72 - ETA: 19s - loss: 0.3852 - acc: 0.8467 - auc_roc: 0.72 - ETA: 18s - loss:
0.3845 - acc: 0.8469 - auc_roc: 0.72 - ETA: 18s - loss: 0.3846 - acc: 0.8466 -
auc_roc: 0.72 - ETA: 17s - loss: 0.3850 - acc: 0.8465 - auc_roc: 0.72 - ETA: 16s
- loss: 0.3850 - acc: 0.8467 - auc_roc: 0.72 - ETA: 15s - loss: 0.3851 - acc:
0.8468 - auc_roc: 0.72 - ETA: 14s - loss: 0.3847 - acc: 0.8470 - auc_roc: 0.72 -
ETA: 13s - loss: 0.3847 - acc: 0.8470 - auc_roc: 0.72 - ETA: 12s - loss: 0.3849
- acc: 0.8467 - auc_roc: 0.72 - ETA: 11s - loss: 0.3847 - acc: 0.8469 - auc_roc:
0.72 - ETA: 10s - loss: 0.3845 - acc: 0.8471 - auc_roc: 0.72 - ETA: 10s - loss:
0.3843 - acc: 0.8471 - auc_roc: 0.72 - ETA: 9s - loss: 0.3841 - acc: 0.8473 -
auc_roc: 0.7231 - ETA: 8s - loss: 0.3841 - acc: 0.8473 - auc_roc: 0.723 - ETA:
7s - loss: 0.3839 - acc: 0.8476 - auc_roc: 0.722 - ETA: 6s - loss: 0.3838 - acc:

```
0.8474 - auc_roc: 0.723 - ETA: 5s - loss: 0.3840 - acc: 0.8474 - auc_roc: 0.723
- ETA: 4s - loss: 0.3837 - acc: 0.8476 - auc_roc: 0.723 - ETA: 3s - loss: 0.3838
- acc: 0.8477 - auc_roc: 0.722 - ETA: 2s - loss: 0.3845 - acc: 0.8473 - auc_roc:
0.722 - ETA: 2s - loss: 0.3841 - acc: 0.8476 - auc_roc: 0.722 - ETA: 1s - loss:
0.3844 - acc: 0.8475 - auc_roc: 0.722 - ETA: 0s - loss: 0.3837 - acc: 0.8478 -
auc_roc: 0.722 - 71s 1ms/step - loss: 0.3837 - acc: 0.8478 - auc_roc: 0.7226 -
val_loss: 0.3836 - val_acc: 0.8468 - val_auc_roc: 0.7329

Epoch 00018: val_auc_roc improved from 0.73014 to 0.73294, saving model to
weights-improvement-model2.hdf5
Epoch 19/30
69918/69918 [==============================] - ETA: 1:19 - loss: 0.3742 - acc:
0.8408 - auc_roc: 0.776 - ETA: 1:15 - loss: 0.3858 - acc: 0.8389 - auc_roc:
0.752 - ETA: 1:12 - loss: 0.3804 - acc: 0.8421 - auc_roc: 0.744 - ETA: 1:09 -
loss: 0.3782 - acc: 0.8445 - auc_roc: 0.740 - ETA: 1:06 - loss: 0.3777 - acc:
0.8463 - auc_roc: 0.737 - ETA: 1:04 - loss: 0.3819 - acc: 0.8452 - auc_roc:
0.732 - ETA: 1:02 - loss: 0.3792 - acc: 0.8467 - auc_roc: 0.734 - ETA: 1:01 -
loss: 0.3830 - acc: 0.8450 - auc_roc: 0.731 - ETA: 1:00 - loss: 0.3804 - acc:
0.8455 - auc_roc: 0.733 - ETA: 59s - loss: 0.3807 - acc: 0.8455 - auc_roc: 0.732
- ETA: 57s - loss: 0.3760 - acc: 0.8482 - auc_roc: 0.73 - ETA: 55s - loss:
0.3780 - acc: 0.8472 - auc_roc: 0.73 - ETA: 54s - loss: 0.3787 - acc: 0.8474 -
auc_roc: 0.73 - ETA: 53s - loss: 0.3807 - acc: 0.8466 - auc_roc: 0.73 - ETA: 52s
- loss: 0.3826 - acc: 0.8455 - auc_roc: 0.73 - ETA: 51s - loss: 0.3824 - acc:
0.8463 - auc_roc: 0.72 - ETA: 49s - loss: 0.3824 - acc: 0.8463 - auc_roc: 0.72 -
ETA: 48s - loss: 0.3809 - acc: 0.8467 - auc_roc: 0.72 - ETA: 47s - loss: 0.3845
- acc: 0.8451 - auc_roc: 0.72 - ETA: 46s - loss: 0.3859 - acc: 0.8443 - auc_roc:
0.72 - ETA: 46s - loss: 0.3862 - acc: 0.8447 - auc_roc: 0.72 - ETA: 45s - loss:
0.3866 - acc: 0.8442 - auc_roc: 0.72 - ETA: 44s - loss: 0.3858 - acc: 0.8450 -
auc_roc: 0.72 - ETA: 43s - loss: 0.3851 - acc: 0.8453 - auc_roc: 0.72 - ETA: 41s
- loss: 0.3861 - acc: 0.8446 - auc_roc: 0.72 - ETA: 40s - loss: 0.3856 - acc:
0.8449 - auc_roc: 0.72 - ETA: 39s - loss: 0.3853 - acc: 0.8450 - auc_roc: 0.72 -
ETA: 38s - loss: 0.3850 - acc: 0.8451 - auc_roc: 0.72 - ETA: 37s - loss: 0.3846
- acc: 0.8453 - auc_roc: 0.72 - ETA: 36s - loss: 0.3842 - acc: 0.8457 - auc_roc:
0.72 - ETA: 35s - loss: 0.3838 - acc: 0.8456 - auc_roc: 0.72 - ETA: 34s - loss:
0.3821 - acc: 0.8465 - auc_roc: 0.72 - ETA: 33s - loss: 0.3822 - acc: 0.8464 -
auc_roc: 0.72 - ETA: 32s - loss: 0.3818 - acc: 0.8468 - auc_roc: 0.72 - ETA: 31s
- loss: 0.3814 - acc: 0.8470 - auc_roc: 0.72 - ETA: 30s - loss: 0.3809 - acc:
0.8473 - auc_roc: 0.72 - ETA: 29s - loss: 0.3815 - acc: 0.8469 - auc_roc: 0.72 -
ETA: 28s - loss: 0.3814 - acc: 0.8471 - auc_roc: 0.72 - ETA: 27s - loss: 0.3812
- acc: 0.8473 - auc_roc: 0.72 - ETA: 26s - loss: 0.3818 - acc: 0.8473 - auc_roc:
0.72 - ETA: 26s - loss: 0.3813 - acc: 0.8475 - auc_roc: 0.72 - ETA: 25s - loss:
0.3807 - acc: 0.8477 - auc_roc: 0.72 - ETA: 24s - loss: 0.3801 - acc: 0.8480 -
auc_roc: 0.72 - ETA: 23s - loss: 0.3808 - acc: 0.8478 - auc_roc: 0.72 - ETA: 22s
- loss: 0.3816 - acc: 0.8474 - auc_roc: 0.72 - ETA: 21s - loss: 0.3817 - acc:
0.8474 - auc_roc: 0.72 - ETA: 20s - loss: 0.3821 - acc: 0.8471 - auc_roc: 0.72 -
ETA: 19s - loss: 0.3822 - acc: 0.8471 - auc_roc: 0.72 - ETA: 18s - loss: 0.3821
- acc: 0.8472 - auc_roc: 0.72 - ETA: 17s - loss: 0.3814 - acc: 0.8474 - auc_roc:
0.72 - ETA: 16s - loss: 0.3809 - acc: 0.8477 - auc_roc: 0.72 - ETA: 15s - loss:
```

```
0.3811 - acc: 0.8476 - auc_roc: 0.72 - ETA: 14s - loss: 0.3816 - acc: 0.8475 -
auc_roc: 0.72 - ETA: 13s - loss: 0.3818 - acc: 0.8474 - auc_roc: 0.72 - ETA: 12s
- loss: 0.3817 - acc: 0.8475 - auc_roc: 0.72 - ETA: 11s - loss: 0.3820 - acc:
0.8473 - auc_roc: 0.72 - ETA: 10s - loss: 0.3814 - acc: 0.8476 - auc_roc: 0.72 -
ETA: 9s - loss: 0.3812 - acc: 0.8477 - auc_roc: 0.7283 - ETA: 8s - loss: 0.3815
- acc: 0.8475 - auc_roc: 0.728 - ETA: 7s - loss: 0.3813 - acc: 0.8475 - auc_roc:
0.728 - ETA: 6s - loss: 0.3814 - acc: 0.8474 - auc_roc: 0.728 - ETA: 5s - loss:
0.3812 - acc: 0.8474 - auc_roc: 0.729 - ETA: 5s - loss: 0.3814 - acc: 0.8475 -
auc_roc: 0.728 - ETA: 4s - loss: 0.3812 - acc: 0.8477 - auc_roc: 0.727 - ETA: 3s
- loss: 0.3814 - acc: 0.8477 - auc_roc: 0.727 - ETA: 2s - loss: 0.3818 - acc:
0.8477 - auc_roc: 0.726 - ETA: 1s - loss: 0.3819 - acc: 0.8476 - auc_roc: 0.726
- ETA: 0s - loss: 0.3816 - acc: 0.8476 - auc_roc: 0.726 - 72s 1ms/step - loss:
0.3815 - acc: 0.8476 - auc_roc: 0.7269 - val_loss: 0.3825 - val_acc: 0.8477 -
val_auc_roc: 0.7332

Epoch 00019: val_auc_roc improved from 0.73294 to 0.73321, saving model to
weights-improvement-model2.hdf5
Epoch 20/30
69918/69918 [==============================] - ETA: 1:01 - loss: 0.3950 - acc:
0.8389 - auc_roc: 0.737 - ETA: 54s - loss: 0.4036 - acc: 0.8345 - auc_roc: 0.726
- ETA: 50s - loss: 0.3892 - acc: 0.8447 - auc_roc: 0.72 - ETA: 49s - loss:
0.3878 - acc: 0.8447 - auc_roc: 0.72 - ETA: 51s - loss: 0.3843 - acc: 0.8447 -
auc_roc: 0.73 - ETA: 52s - loss: 0.3823 - acc: 0.8459 - auc_roc: 0.73 - ETA: 50s
- loss: 0.3801 - acc: 0.8474 - auc_roc: 0.73 - ETA: 49s - loss: 0.3773 - acc:
0.8485 - auc_roc: 0.73 - ETA: 48s - loss: 0.3774 - acc: 0.8483 - auc_roc: 0.73 -
ETA: 46s - loss: 0.3805 - acc: 0.8479 - auc_roc: 0.72 - ETA: 45s - loss: 0.3787
- acc: 0.8477 - auc_roc: 0.73 - ETA: 44s - loss: 0.3788 - acc: 0.8479 - auc_roc:
0.73 - ETA: 42s - loss: 0.3825 - acc: 0.8463 - auc_roc: 0.72 - ETA: 41s - loss:
0.3836 - acc: 0.8460 - auc_roc: 0.72 - ETA: 41s - loss: 0.3822 - acc: 0.8466 -
auc_roc: 0.73 - ETA: 40s - loss: 0.3816 - acc: 0.8474 - auc_roc: 0.72 - ETA: 39s
- loss: 0.3820 - acc: 0.8466 - auc_roc: 0.73 - ETA: 38s - loss: 0.3820 - acc:
0.8466 - auc_roc: 0.73 - ETA: 37s - loss: 0.3836 - acc: 0.8459 - auc_roc: 0.72 -
ETA: 36s - loss: 0.3829 - acc: 0.8464 - auc_roc: 0.72 - ETA: 36s - loss: 0.3821
- acc: 0.8469 - auc_roc: 0.72 - ETA: 35s - loss: 0.3800 - acc: 0.8478 - auc_roc:
0.73 - ETA: 34s - loss: 0.3808 - acc: 0.8473 - auc_roc: 0.73 - ETA: 33s - loss:
0.3803 - acc: 0.8473 - auc_roc: 0.73 - ETA: 32s - loss: 0.3809 - acc: 0.8473 -
auc_roc: 0.72 - ETA: 31s - loss: 0.3804 - acc: 0.8475 - auc_roc: 0.73 - ETA: 31s
- loss: 0.3796 - acc: 0.8482 - auc_roc: 0.73 - ETA: 30s - loss: 0.3803 - acc:
0.8479 - auc_roc: 0.72 - ETA: 29s - loss: 0.3800 - acc: 0.8482 - auc_roc: 0.72 -
ETA: 29s - loss: 0.3806 - acc: 0.8478 - auc_roc: 0.72 - ETA: 28s - loss: 0.3805
- acc: 0.8479 - auc_roc: 0.72 - ETA: 27s - loss: 0.3804 - acc: 0.8479 - auc_roc:
0.72 - ETA: 26s - loss: 0.3812 - acc: 0.8476 - auc_roc: 0.72 - ETA: 26s - loss:
0.3813 - acc: 0.8475 - auc_roc: 0.72 - ETA: 25s - loss: 0.3813 - acc: 0.8476 -
auc_roc: 0.72 - ETA: 25s - loss: 0.3800 - acc: 0.8482 - auc_roc: 0.72 - ETA: 24s
- loss: 0.3789 - acc: 0.8488 - auc_roc: 0.73 - ETA: 23s - loss: 0.3785 - acc:
0.8489 - auc_roc: 0.73 - ETA: 23s - loss: 0.3778 - acc: 0.8490 - auc_roc: 0.73 -
ETA: 22s - loss: 0.3779 - acc: 0.8489 - auc_roc: 0.73 - ETA: 21s - loss: 0.3778
- acc: 0.8489 - auc_roc: 0.73 - ETA: 21s - loss: 0.3776 - acc: 0.8489 - auc_roc:
```

```
0.73 - ETA: 20s - loss: 0.3774 - acc: 0.8491 - auc_roc: 0.73 - ETA: 19s - loss:
0.3775 - acc: 0.8490 - auc_roc: 0.73 - ETA: 19s - loss: 0.3778 - acc: 0.8488 -
auc_roc: 0.73 - ETA: 18s - loss: 0.3777 - acc: 0.8488 - auc_roc: 0.73 - ETA: 17s
- loss: 0.3783 - acc: 0.8484 - auc_roc: 0.73 - ETA: 16s - loss: 0.3781 - acc:
0.8485 - auc_roc: 0.73 - ETA: 16s - loss: 0.3777 - acc: 0.8485 - auc_roc: 0.73 -
ETA: 15s - loss: 0.3777 - acc: 0.8488 - auc_roc: 0.73 - ETA: 14s - loss: 0.3780
- acc: 0.8487 - auc_roc: 0.73 - ETA: 13s - loss: 0.3776 - acc: 0.8487 - auc_roc:
0.73 - ETA: 13s - loss: 0.3781 - acc: 0.8482 - auc_roc: 0.73 - ETA: 12s - loss:
0.3781 - acc: 0.8482 - auc_roc: 0.73 - ETA: 11s - loss: 0.3783 - acc: 0.8482 -
auc_roc: 0.73 - ETA: 10s - loss: 0.3784 - acc: 0.8481 - auc_roc: 0.73 - ETA: 9s
- loss: 0.3785 - acc: 0.8481 - auc_roc: 0.7329 - ETA: 9s - loss: 0.3790 - acc:
0.8480 - auc_roc: 0.732 - ETA: 8s - loss: 0.3786 - acc: 0.8483 - auc_roc: 0.732
- ETA: 7s - loss: 0.3795 - acc: 0.8480 - auc_roc: 0.731 - ETA: 6s - loss: 0.3796
- acc: 0.8480 - auc_roc: 0.731 - ETA: 5s - loss: 0.3794 - acc: 0.8481 - auc_roc:
0.731 - ETA: 4s - loss: 0.3796 - acc: 0.8481 - auc_roc: 0.730 - ETA: 3s - loss:
0.3792 - acc: 0.8480 - auc_roc: 0.731 - ETA: 2s - loss: 0.3794 - acc: 0.8478 -
auc_roc: 0.731 - ETA: 2s - loss: 0.3795 - acc: 0.8477 - auc_roc: 0.731 - ETA: 1s
- loss: 0.3786 - acc: 0.8482 - auc_roc: 0.732 - ETA: 0s - loss: 0.3792 - acc:
0.8480 - auc_roc: 0.732 - 70s 998us/step - loss: 0.3793 - acc: 0.8480 - auc_roc:
0.7318 - val_loss: 0.3821 - val_acc: 0.8471 - val_auc_roc: 0.7365

Epoch 00020: val_auc_roc improved from 0.73321 to 0.73650, saving model to
weights-improvement-model2.hdf5
Epoch 21/30
69918/69918 [==============================] - ETA: 1:04 - loss: 0.3742 - acc:
0.8496 - auc_roc: 0.729 - ETA: 1:02 - loss: 0.3910 - acc: 0.8369 - auc_roc:
0.735 - ETA: 1:00 - loss: 0.3926 - acc: 0.8353 - auc_roc: 0.736 - ETA: 59s -
loss: 0.3857 - acc: 0.8408 - auc_roc: 0.739 - ETA: 57s - loss: 0.3835 - acc:
0.8438 - auc_roc: 0.73 - ETA: 56s - loss: 0.3853 - acc: 0.8442 - auc_roc: 0.72 -
ETA: 55s - loss: 0.3835 - acc: 0.8454 - auc_roc: 0.72 - ETA: 54s - loss: 0.3819
- acc: 0.8469 - auc_roc: 0.73 - ETA: 53s - loss: 0.3829 - acc: 0.8466 - auc_roc:
0.72 - ETA: 52s - loss: 0.3823 - acc: 0.8467 - auc_roc: 0.73 - ETA: 51s - loss:
0.3812 - acc: 0.8471 - auc_roc: 0.73 - ETA: 50s - loss: 0.3829 - acc: 0.8465 -
auc_roc: 0.73 - ETA: 49s - loss: 0.3808 - acc: 0.8476 - auc_roc: 0.73 - ETA: 48s
- loss: 0.3817 - acc: 0.8470 - auc_roc: 0.73 - ETA: 47s - loss: 0.3832 - acc:
0.8462 - auc_roc: 0.72 - ETA: 46s - loss: 0.3833 - acc: 0.8459 - auc_roc: 0.73 -
ETA: 45s - loss: 0.3830 - acc: 0.8458 - auc_roc: 0.73 - ETA: 44s - loss: 0.3811
- acc: 0.8466 - auc_roc: 0.73 - ETA: 43s - loss: 0.3819 - acc: 0.8463 - auc_roc:
0.73 - ETA: 42s - loss: 0.3821 - acc: 0.8464 - auc_roc: 0.73 - ETA: 42s - loss:
0.3824 - acc: 0.8463 - auc_roc: 0.73 - ETA: 41s - loss: 0.3826 - acc: 0.8465 -
auc_roc: 0.73 - ETA: 40s - loss: 0.3822 - acc: 0.8469 - auc_roc: 0.73 - ETA: 39s
- loss: 0.3824 - acc: 0.8468 - auc_roc: 0.73 - ETA: 39s - loss: 0.3823 - acc:
0.8466 - auc_roc: 0.73 - ETA: 38s - loss: 0.3823 - acc: 0.8466 - auc_roc: 0.73 -
ETA: 37s - loss: 0.3819 - acc: 0.8468 - auc_roc: 0.73 - ETA: 36s - loss: 0.3825
- acc: 0.8466 - auc_roc: 0.73 - ETA: 35s - loss: 0.3820 - acc: 0.8466 - auc_roc:
0.73 - ETA: 34s - loss: 0.3832 - acc: 0.8459 - auc_roc: 0.73 - ETA: 33s - loss:
0.3833 - acc: 0.8460 - auc_roc: 0.73 - ETA: 33s - loss: 0.3839 - acc: 0.8455 -
auc_roc: 0.73 - ETA: 32s - loss: 0.3829 - acc: 0.8459 - auc_roc: 0.73 - ETA: 31s
```

- loss: 0.3829 - acc: 0.8462 - auc_roc: 0.73 - ETA: 30s - loss: 0.3826 - acc:
0.8461 - auc_roc: 0.73 - ETA: 29s - loss: 0.3837 - acc: 0.8456 - auc_roc: 0.73 -
ETA: 28s - loss: 0.3845 - acc: 0.8454 - auc_roc: 0.73 - ETA: 28s - loss: 0.3835
- acc: 0.8458 - auc_roc: 0.73 - ETA: 27s - loss: 0.3836 - acc: 0.8457 - auc_roc:
0.73 - ETA: 26s - loss: 0.3836 - acc: 0.8456 - auc_roc: 0.73 - ETA: 25s - loss:
0.3836 - acc: 0.8455 - auc_roc: 0.73 - ETA: 24s - loss: 0.3831 - acc: 0.8457 -
auc_roc: 0.73 - ETA: 23s - loss: 0.3820 - acc: 0.8462 - auc_roc: 0.73 - ETA: 22s
- loss: 0.3813 - acc: 0.8465 - auc_roc: 0.73 - ETA: 21s - loss: 0.3811 - acc:
0.8466 - auc_roc: 0.73 - ETA: 20s - loss: 0.3813 - acc: 0.8464 - auc_roc: 0.73 -
ETA: 20s - loss: 0.3810 - acc: 0.8466 - auc_roc: 0.73 - ETA: 19s - loss: 0.3806
- acc: 0.8470 - auc_roc: 0.73 - ETA: 18s - loss: 0.3799 - acc: 0.8473 - auc_roc:
0.73 - ETA: 17s - loss: 0.3799 - acc: 0.8473 - auc_roc: 0.73 - ETA: 16s - loss:
0.3795 - acc: 0.8476 - auc_roc: 0.73 - ETA: 15s - loss: 0.3794 - acc: 0.8477 -
auc_roc: 0.73 - ETA: 14s - loss: 0.3790 - acc: 0.8479 - auc_roc: 0.73 - ETA: 13s
- loss: 0.3789 - acc: 0.8480 - auc_roc: 0.73 - ETA: 12s - loss: 0.3791 - acc:
0.8479 - auc_roc: 0.73 - ETA: 11s - loss: 0.3802 - acc: 0.8472 - auc_roc: 0.73 -
ETA: 10s - loss: 0.3797 - acc: 0.8475 - auc_roc: 0.73 - ETA: 9s - loss: 0.3795 -
acc: 0.8474 - auc_roc: 0.7336 - ETA: 8s - loss: 0.3792 - acc: 0.8477 - auc_roc:
0.733 - ETA: 7s - loss: 0.3789 - acc: 0.8479 - auc_roc: 0.733 - ETA: 6s - loss:
0.3788 - acc: 0.8480 - auc_roc: 0.733 - ETA: 5s - loss: 0.3786 - acc: 0.8480 -
auc_roc: 0.734 - ETA: 5s - loss: 0.3791 - acc: 0.8477 - auc_roc: 0.734 - ETA: 4s
- loss: 0.3792 - acc: 0.8475 - auc_roc: 0.734 - ETA: 3s - loss: 0.3794 - acc:
0.8476 - auc_roc: 0.733 - ETA: 2s - loss: 0.3791 - acc: 0.8477 - auc_roc: 0.733
- ETA: 1s - loss: 0.3782 - acc: 0.8480 - auc_roc: 0.734 - ETA: 0s - loss: 0.3781
- acc: 0.8481 - auc_roc: 0.734 - 73s 1ms/step - loss: 0.3782 - acc: 0.8480 -
auc_roc: 0.7342 - val_loss: 0.3766 - val_acc: 0.8469 - val_auc_roc: 0.7399

Epoch 00021: val_auc_roc improved from 0.73650 to 0.73988, saving model to
weights-improvement-model2.hdf5
Epoch 22/30
69918/69918 [==============================] - ETA: 1:02 - loss: 0.4183 - acc:
0.8223 - auc_roc: 0.739 - ETA: 59s - loss: 0.3908 - acc: 0.8384 - auc_roc: 0.743
- ETA: 59s - loss: 0.3886 - acc: 0.8431 - auc_roc: 0.73 - ETA: 59s - loss:
0.3879 - acc: 0.8398 - auc_roc: 0.74 - ETA: 59s - loss: 0.3874 - acc: 0.8422 -
auc_roc: 0.73 - ETA: 58s - loss: 0.3848 - acc: 0.8434 - auc_roc: 0.73 - ETA: 57s
- loss: 0.3823 - acc: 0.8456 - auc_roc: 0.73 - ETA: 56s - loss: 0.3788 - acc:
0.8480 - auc_roc: 0.73 - ETA: 56s - loss: 0.3746 - acc: 0.8505 - auc_roc: 0.73 -
ETA: 55s - loss: 0.3719 - acc: 0.8526 - auc_roc: 0.73 - ETA: 54s - loss: 0.3724
- acc: 0.8517 - auc_roc: 0.73 - ETA: 53s - loss: 0.3731 - acc: 0.8512 - auc_roc:
0.73 - ETA: 52s - loss: 0.3773 - acc: 0.8492 - auc_roc: 0.73 - ETA: 52s - loss:
0.3786 - acc: 0.8480 - auc_roc: 0.73 - ETA: 51s - loss: 0.3774 - acc: 0.8487 -
auc_roc: 0.73 - ETA: 50s - loss: 0.3781 - acc: 0.8486 - auc_roc: 0.73 - ETA: 49s
- loss: 0.3789 - acc: 0.8479 - auc_roc: 0.73 - ETA: 48s - loss: 0.3772 - acc:
0.8490 - auc_roc: 0.73 - ETA: 47s - loss: 0.3772 - acc: 0.8489 - auc_roc: 0.73 -
ETA: 46s - loss: 0.3780 - acc: 0.8488 - auc_roc: 0.73 - ETA: 45s - loss: 0.3784
- acc: 0.8481 - auc_roc: 0.73 - ETA: 44s - loss: 0.3772 - acc: 0.8486 - auc_roc:
0.73 - ETA: 43s - loss: 0.3785 - acc: 0.8481 - auc_roc: 0.73 - ETA: 42s - loss:
0.3789 - acc: 0.8474 - auc_roc: 0.73 - ETA: 41s - loss: 0.3787 - acc: 0.8475 -

```
auc_roc: 0.73 - ETA: 40s - loss: 0.3787 - acc: 0.8477 - auc_roc: 0.73 - ETA: 39s
- loss: 0.3779 - acc: 0.8482 - auc_roc: 0.73 - ETA: 38s - loss: 0.3764 - acc:
0.8491 - auc_roc: 0.73 - ETA: 37s - loss: 0.3779 - acc: 0.8485 - auc_roc: 0.73 -
ETA: 36s - loss: 0.3771 - acc: 0.8488 - auc_roc: 0.73 - ETA: 35s - loss: 0.3759
- acc: 0.8493 - auc_roc: 0.73 - ETA: 34s - loss: 0.3764 - acc: 0.8490 - auc_roc:
0.73 - ETA: 33s - loss: 0.3753 - acc: 0.8501 - auc_roc: 0.73 - ETA: 32s - loss:
0.3759 - acc: 0.8498 - auc_roc: 0.73 - ETA: 31s - loss: 0.3753 - acc: 0.8499 -
auc_roc: 0.73 - ETA: 30s - loss: 0.3751 - acc: 0.8500 - auc_roc: 0.73 - ETA: 29s
- loss: 0.3752 - acc: 0.8503 - auc_roc: 0.73 - ETA: 28s - loss: 0.3755 - acc:
0.8499 - auc_roc: 0.73 - ETA: 27s - loss: 0.3754 - acc: 0.8498 - auc_roc: 0.73 -
ETA: 26s - loss: 0.3752 - acc: 0.8500 - auc_roc: 0.73 - ETA: 25s - loss: 0.3759
- acc: 0.8496 - auc_roc: 0.73 - ETA: 24s - loss: 0.3756 - acc: 0.8498 - auc_roc:
0.73 - ETA: 23s - loss: 0.3751 - acc: 0.8502 - auc_roc: 0.73 - ETA: 22s - loss:
0.3750 - acc: 0.8501 - auc_roc: 0.73 - ETA: 21s - loss: 0.3747 - acc: 0.8502 -
auc_roc: 0.73 - ETA: 21s - loss: 0.3749 - acc: 0.8502 - auc_roc: 0.73 - ETA: 20s
- loss: 0.3754 - acc: 0.8499 - auc_roc: 0.73 - ETA: 19s - loss: 0.3747 - acc:
0.8504 - auc_roc: 0.73 - ETA: 18s - loss: 0.3746 - acc: 0.8503 - auc_roc: 0.73 -
ETA: 17s - loss: 0.3748 - acc: 0.8501 - auc_roc: 0.73 - ETA: 16s - loss: 0.3749
- acc: 0.8500 - auc_roc: 0.73 - ETA: 15s - loss: 0.3755 - acc: 0.8498 - auc_roc:
0.73 - ETA: 14s - loss: 0.3758 - acc: 0.8494 - auc_roc: 0.73 - ETA: 13s - loss:
0.3759 - acc: 0.8493 - auc_roc: 0.73 - ETA: 12s - loss: 0.3760 - acc: 0.8493 -
auc_roc: 0.73 - ETA: 11s - loss: 0.3760 - acc: 0.8494 - auc_roc: 0.73 - ETA: 10s
- loss: 0.3762 - acc: 0.8491 - auc_roc: 0.73 - ETA: 9s - loss: 0.3762 - acc:
0.8491 - auc_roc: 0.7357 - ETA: 8s - loss: 0.3767 - acc: 0.8488 - auc_roc: 0.735
- ETA: 7s - loss: 0.3770 - acc: 0.8486 - auc_roc: 0.735 - ETA: 6s - loss: 0.3768
- acc: 0.8486 - auc_roc: 0.735 - ETA: 5s - loss: 0.3766 - acc: 0.8486 - auc_roc:
0.735 - ETA: 4s - loss: 0.3766 - acc: 0.8486 - auc_roc: 0.736 - ETA: 4s - loss:
0.3771 - acc: 0.8483 - auc_roc: 0.736 - ETA: 3s - loss: 0.3766 - acc: 0.8486 -
auc_roc: 0.736 - ETA: 2s - loss: 0.3770 - acc: 0.8484 - auc_roc: 0.736 - ETA: 1s
- loss: 0.3770 - acc: 0.8484 - auc_roc: 0.736 - ETA: 0s - loss: 0.3770 - acc:
0.8484 - auc_roc: 0.736 - 72s 1ms/step - loss: 0.3769 - acc: 0.8484 - auc_roc:
0.7363 - val_loss: 0.3769 - val_acc: 0.8475 - val_auc_roc: 0.7404

Epoch 00022: val_auc_roc improved from 0.73988 to 0.74044, saving model to
weights-improvement-model2.hdf5
Epoch 23/30
69918/69918 [==============================] - ETA: 59s - loss: 0.3973 - acc:
0.8340 - auc_roc: 0.74 - ETA: 59s - loss: 0.3829 - acc: 0.8423 - auc_roc: 0.73 -
ETA: 58s - loss: 0.3628 - acc: 0.8545 - auc_roc: 0.74 - ETA: 58s - loss: 0.3702
- acc: 0.8508 - auc_roc: 0.74 - ETA: 57s - loss: 0.3736 - acc: 0.8479 - auc_roc:
0.74 - ETA: 56s - loss: 0.3755 - acc: 0.8481 - auc_roc: 0.74 - ETA: 55s - loss:
0.3729 - acc: 0.8500 - auc_roc: 0.74 - ETA: 55s - loss: 0.3755 - acc: 0.8488 -
auc_roc: 0.73 - ETA: 54s - loss: 0.3752 - acc: 0.8493 - auc_roc: 0.73 - ETA: 53s
- loss: 0.3752 - acc: 0.8495 - auc_roc: 0.73 - ETA: 53s - loss: 0.3749 - acc:
0.8493 - auc_roc: 0.73 - ETA: 52s - loss: 0.3755 - acc: 0.8493 - auc_roc: 0.73 -
ETA: 51s - loss: 0.3757 - acc: 0.8486 - auc_roc: 0.73 - ETA: 49s - loss: 0.3778
- acc: 0.8474 - auc_roc: 0.73 - ETA: 48s - loss: 0.3766 - acc: 0.8480 - auc_roc:
0.73 - ETA: 47s - loss: 0.3754 - acc: 0.8485 - auc_roc: 0.73 - ETA: 46s - loss:
```

```
0.3743 - acc: 0.8490 - auc_roc: 0.73 - ETA: 45s - loss: 0.3724 - acc: 0.8492 -
auc_roc: 0.74 - ETA: 44s - loss: 0.3733 - acc: 0.8486 - auc_roc: 0.74 - ETA: 43s
- loss: 0.3734 - acc: 0.8487 - auc_roc: 0.74 - ETA: 42s - loss: 0.3735 - acc:
0.8488 - auc_roc: 0.74 - ETA: 41s - loss: 0.3737 - acc: 0.8490 - auc_roc: 0.73 -
ETA: 40s - loss: 0.3722 - acc: 0.8504 - auc_roc: 0.73 - ETA: 39s - loss: 0.3724
- acc: 0.8502 - auc_roc: 0.73 - ETA: 38s - loss: 0.3728 - acc: 0.8501 - auc_roc:
0.73 - ETA: 37s - loss: 0.3721 - acc: 0.8506 - auc_roc: 0.73 - ETA: 37s - loss:
0.3730 - acc: 0.8501 - auc_roc: 0.73 - ETA: 36s - loss: 0.3734 - acc: 0.8496 -
auc_roc: 0.73 - ETA: 35s - loss: 0.3727 - acc: 0.8498 - auc_roc: 0.73 - ETA: 34s
- loss: 0.3736 - acc: 0.8493 - auc_roc: 0.73 - ETA: 34s - loss: 0.3743 - acc:
0.8490 - auc_roc: 0.73 - ETA: 33s - loss: 0.3745 - acc: 0.8488 - auc_roc: 0.73 -
ETA: 32s - loss: 0.3742 - acc: 0.8488 - auc_roc: 0.73 - ETA: 31s - loss: 0.3736
- acc: 0.8491 - auc_roc: 0.73 - ETA: 30s - loss: 0.3727 - acc: 0.8494 - auc_roc:
0.74 - ETA: 29s - loss: 0.3734 - acc: 0.8490 - auc_roc: 0.74 - ETA: 28s - loss:
0.3733 - acc: 0.8491 - auc_roc: 0.74 - ETA: 28s - loss: 0.3742 - acc: 0.8489 -
auc_roc: 0.73 - ETA: 27s - loss: 0.3753 - acc: 0.8485 - auc_roc: 0.73 - ETA: 26s
- loss: 0.3748 - acc: 0.8488 - auc_roc: 0.73 - ETA: 25s - loss: 0.3744 - acc:
0.8492 - auc_roc: 0.73 - ETA: 24s - loss: 0.3741 - acc: 0.8492 - auc_roc: 0.73 -
ETA: 23s - loss: 0.3746 - acc: 0.8489 - auc_roc: 0.73 - ETA: 22s - loss: 0.3749
- acc: 0.8486 - auc_roc: 0.73 - ETA: 21s - loss: 0.3754 - acc: 0.8482 - auc_roc:
0.73 - ETA: 20s - loss: 0.3762 - acc: 0.8478 - auc_roc: 0.73 - ETA: 19s - loss:
0.3762 - acc: 0.8479 - auc_roc: 0.73 - ETA: 18s - loss: 0.3758 - acc: 0.8481 -
auc_roc: 0.73 - ETA: 17s - loss: 0.3763 - acc: 0.8479 - auc_roc: 0.73 - ETA: 16s
- loss: 0.3761 - acc: 0.8479 - auc_roc: 0.73 - ETA: 15s - loss: 0.3757 - acc:
0.8483 - auc_roc: 0.73 - ETA: 14s - loss: 0.3760 - acc: 0.8481 - auc_roc: 0.73 -
ETA: 14s - loss: 0.3756 - acc: 0.8482 - auc_roc: 0.73 - ETA: 13s - loss: 0.3757
- acc: 0.8481 - auc_roc: 0.73 - ETA: 12s - loss: 0.3755 - acc: 0.8482 - auc_roc:
0.73 - ETA: 11s - loss: 0.3758 - acc: 0.8480 - auc_roc: 0.73 - ETA: 10s - loss:
0.3757 - acc: 0.8481 - auc_roc: 0.73 - ETA: 9s - loss: 0.3756 - acc: 0.8481 -
auc_roc: 0.7391 - ETA: 8s - loss: 0.3758 - acc: 0.8478 - auc_roc: 0.739 - ETA:
7s - loss: 0.3759 - acc: 0.8479 - auc_roc: 0.738 - ETA: 6s - loss: 0.3764 - acc:
0.8478 - auc_roc: 0.738 - ETA: 5s - loss: 0.3761 - acc: 0.8479 - auc_roc: 0.738
- ETA: 4s - loss: 0.3760 - acc: 0.8478 - auc_roc: 0.739 - ETA: 3s - loss: 0.3763
- acc: 0.8476 - auc_roc: 0.739 - ETA: 2s - loss: 0.3759 - acc: 0.8478 - auc_roc:
0.739 - ETA: 2s - loss: 0.3758 - acc: 0.8477 - auc_roc: 0.740 - ETA: 1s - loss:
0.3756 - acc: 0.8479 - auc_roc: 0.739 - ETA: 0s - loss: 0.3754 - acc: 0.8480 -
auc_roc: 0.739 - 70s 1ms/step - loss: 0.3754 - acc: 0.8479 - auc_roc: 0.7402 -
val_loss: 0.3813 - val_acc: 0.8478 - val_auc_roc: 0.7420

Epoch 00023: val_auc_roc improved from 0.74044 to 0.74200, saving model to
weights-improvement-model2.hdf5
Epoch 24/30
69918/69918 [==============================] - ETA: 1:02 - loss: 0.3558 - acc:
0.8584 - auc_roc: 0.742 - ETA: 1:01 - loss: 0.3710 - acc: 0.8501 - auc_roc:
0.736 - ETA: 1:00 - loss: 0.3688 - acc: 0.8516 - auc_roc: 0.738 - ETA: 59s -
loss: 0.3742 - acc: 0.8481 - auc_roc: 0.738 - ETA: 57s - loss: 0.3773 - acc:
0.8451 - auc_roc: 0.74 - ETA: 57s - loss: 0.3784 - acc: 0.8444 - auc_roc: 0.74 -
ETA: 56s - loss: 0.3773 - acc: 0.8449 - auc_roc: 0.74 - ETA: 54s - loss: 0.3725
```

```
- acc: 0.8475 - auc_roc: 0.74 - ETA: 53s - loss: 0.3763 - acc: 0.8464 - auc_roc:
0.74 - ETA: 53s - loss: 0.3761 - acc: 0.8466 - auc_roc: 0.74 - ETA: 52s - loss:
0.3762 - acc: 0.8466 - auc_roc: 0.74 - ETA: 51s - loss: 0.3754 - acc: 0.8471 -
auc_roc: 0.73 - ETA: 51s - loss: 0.3770 - acc: 0.8461 - auc_roc: 0.74 - ETA: 50s
- loss: 0.3789 - acc: 0.8459 - auc_roc: 0.73 - ETA: 50s - loss: 0.3822 - acc:
0.8434 - auc_roc: 0.73 - ETA: 50s - loss: 0.3800 - acc: 0.8446 - auc_roc: 0.73 -
ETA: 49s - loss: 0.3800 - acc: 0.8448 - auc_roc: 0.73 - ETA: 49s - loss: 0.3794
- acc: 0.8448 - auc_roc: 0.73 - ETA: 49s - loss: 0.3779 - acc: 0.8454 - auc_roc:
0.74 - ETA: 49s - loss: 0.3776 - acc: 0.8457 - auc_roc: 0.74 - ETA: 49s - loss:
0.3764 - acc: 0.8463 - auc_roc: 0.74 - ETA: 48s - loss: 0.3754 - acc: 0.8466 -
auc_roc: 0.74 - ETA: 47s - loss: 0.3744 - acc: 0.8471 - auc_roc: 0.74 - ETA: 46s
- loss: 0.3754 - acc: 0.8469 - auc_roc: 0.74 - ETA: 45s - loss: 0.3762 - acc:
0.8467 - auc_roc: 0.74 - ETA: 43s - loss: 0.3762 - acc: 0.8466 - auc_roc: 0.74 -
ETA: 42s - loss: 0.3768 - acc: 0.8465 - auc_roc: 0.74 - ETA: 41s - loss: 0.3763
- acc: 0.8468 - auc_roc: 0.74 - ETA: 40s - loss: 0.3760 - acc: 0.8471 - auc_roc:
0.74 - ETA: 39s - loss: 0.3764 - acc: 0.8469 - auc_roc: 0.74 - ETA: 38s - loss:
0.3762 - acc: 0.8469 - auc_roc: 0.74 - ETA: 36s - loss: 0.3757 - acc: 0.8470 -
auc_roc: 0.74 - ETA: 35s - loss: 0.3759 - acc: 0.8467 - auc_roc: 0.74 - ETA: 34s
- loss: 0.3762 - acc: 0.8465 - auc_roc: 0.74 - ETA: 33s - loss: 0.3756 - acc:
0.8468 - auc_roc: 0.74 - ETA: 32s - loss: 0.3754 - acc: 0.8467 - auc_roc: 0.74 -
ETA: 31s - loss: 0.3754 - acc: 0.8468 - auc_roc: 0.74 - ETA: 30s - loss: 0.3762
- acc: 0.8464 - auc_roc: 0.74 - ETA: 29s - loss: 0.3756 - acc: 0.8470 - auc_roc:
0.74 - ETA: 28s - loss: 0.3762 - acc: 0.8469 - auc_roc: 0.74 - ETA: 27s - loss:
0.3762 - acc: 0.8471 - auc_roc: 0.74 - ETA: 26s - loss: 0.3755 - acc: 0.8474 -
auc_roc: 0.74 - ETA: 25s - loss: 0.3757 - acc: 0.8477 - auc_roc: 0.74 - ETA: 24s
- loss: 0.3763 - acc: 0.8474 - auc_roc: 0.73 - ETA: 23s - loss: 0.3758 - acc:
0.8478 - auc_roc: 0.73 - ETA: 21s - loss: 0.3758 - acc: 0.8477 - auc_roc: 0.74 -
ETA: 20s - loss: 0.3752 - acc: 0.8478 - auc_roc: 0.74 - ETA: 19s - loss: 0.3749
- acc: 0.8478 - auc_roc: 0.74 - ETA: 18s - loss: 0.3752 - acc: 0.8477 - auc_roc:
0.74 - ETA: 17s - loss: 0.3752 - acc: 0.8478 - auc_roc: 0.74 - ETA: 16s - loss:
0.3754 - acc: 0.8477 - auc_roc: 0.74 - ETA: 15s - loss: 0.3755 - acc: 0.8476 -
auc_roc: 0.74 - ETA: 14s - loss: 0.3752 - acc: 0.8477 - auc_roc: 0.74 - ETA: 13s
- loss: 0.3751 - acc: 0.8478 - auc_roc: 0.74 - ETA: 12s - loss: 0.3752 - acc:
0.8478 - auc_roc: 0.74 - ETA: 11s - loss: 0.3757 - acc: 0.8476 - auc_roc: 0.73 -
ETA: 10s - loss: 0.3761 - acc: 0.8474 - auc_roc: 0.73 - ETA: 9s - loss: 0.3761 -
acc: 0.8473 - auc_roc: 0.7400 - ETA: 8s - loss: 0.3762 - acc: 0.8473 - auc_roc:
0.740 - ETA: 7s - loss: 0.3764 - acc: 0.8472 - auc_roc: 0.740 - ETA: 6s - loss:
0.3763 - acc: 0.8473 - auc_roc: 0.740 - ETA: 5s - loss: 0.3756 - acc: 0.8475 -
auc_roc: 0.741 - ETA: 4s - loss: 0.3751 - acc: 0.8478 - auc_roc: 0.741 - ETA: 4s
- loss: 0.3750 - acc: 0.8480 - auc_roc: 0.741 - ETA: 3s - loss: 0.3746 - acc:
0.8482 - auc_roc: 0.741 - ETA: 2s - loss: 0.3745 - acc: 0.8483 - auc_roc: 0.741
- ETA: 1s - loss: 0.3742 - acc: 0.8485 - auc_roc: 0.741 - ETA: 0s - loss: 0.3744
- acc: 0.8483 - auc_roc: 0.741 - 71s 1ms/step - loss: 0.3745 - acc: 0.8483 -
auc_roc: 0.7414 - val_loss: 0.3753 - val_acc: 0.8488 - val_auc_roc: 0.7408

Epoch 00024: val_auc_roc did not improve from 0.74200
Epoch 25/30
69918/69918 [==============================] - ETA: 58s - loss: 0.3819 - acc:
```

0.8477 - auc_roc: 0.73 - ETA: 55s - loss: 0.3947 - acc: 0.8398 - auc_roc: 0.73 - ETA: 53s - loss: 0.3871 - acc: 0.8441 - auc_roc: 0.73 - ETA: 52s - loss: 0.3806 - acc: 0.8467 - auc_roc: 0.74 - ETA: 51s - loss: 0.3748 - acc: 0.8477 - auc_roc: 0.74 - ETA: 50s - loss: 0.3794 - acc: 0.8464 - auc_roc: 0.73 - ETA: 50s - loss: 0.3828 - acc: 0.8444 - auc_roc: 0.73 - ETA: 49s - loss: 0.3800 - acc: 0.8456 - auc_roc: 0.74 - ETA: 48s - loss: 0.3792 - acc: 0.8451 - auc_roc: 0.74 - ETA: 47s - loss: 0.3775 - acc: 0.8454 - auc_roc: 0.74 - ETA: 46s - loss: 0.3788 - acc: 0.8455 - auc_roc: 0.73 - ETA: 45s - loss: 0.3786 - acc: 0.8445 - auc_roc: 0.74 - ETA: 44s - loss: 0.3784 - acc: 0.8444 - auc_roc: 0.74 - ETA: 43s - loss: 0.3793 - acc: 0.8437 - auc_roc: 0.74 - ETA: 43s - loss: 0.3814 - acc: 0.8431 - auc_roc: 0.74 - ETA: 42s - loss: 0.3833 - acc: 0.8423 - auc_roc: 0.73 - ETA: 41s - loss: 0.3824 - acc: 0.8425 - auc_roc: 0.74 - ETA: 40s - loss: 0.3834 - acc: 0.8429 - auc_roc: 0.73 - ETA: 39s - loss: 0.3825 - acc: 0.8430 - auc_roc: 0.73 - ETA: 39s - loss: 0.3820 - acc: 0.8430 - auc_roc: 0.74 - ETA: 38s - loss: 0.3814 - acc: 0.8433 - auc_roc: 0.74 - ETA: 37s - loss: 0.3804 - acc: 0.8441 - auc_roc: 0.74 - ETA: 36s - loss: 0.3785 - acc: 0.8452 - auc_roc: 0.74 - ETA: 35s - loss: 0.3784 - acc: 0.8450 - auc_roc: 0.74 - ETA: 34s - loss: 0.3783 - acc: 0.8454 - auc_roc: 0.74 - ETA: 34s - loss: 0.3771 - acc: 0.8461 - auc_roc: 0.74 - ETA: 33s - loss: 0.3764 - acc: 0.8466 - auc_roc: 0.74 - ETA: 32s - loss: 0.3763 - acc: 0.8472 - auc_roc: 0.74 - ETA: 31s - loss: 0.3770 - acc: 0.8469 - auc_roc: 0.74 - ETA: 30s - loss: 0.3764 - acc: 0.8472 - auc_roc: 0.74 - ETA: 29s - loss: 0.3781 - acc: 0.8464 - auc_roc: 0.74 - ETA: 29s - loss: 0.3771 - acc: 0.8470 - auc_roc: 0.74 - ETA: 28s - loss: 0.3768 - acc: 0.8472 - auc_roc: 0.73 - ETA: 27s - loss: 0.3763 - acc: 0.8475 - auc_roc: 0.74 - ETA: 26s - loss: 0.3756 - acc: 0.8480 - auc_roc: 0.74 - ETA: 25s - loss: 0.3753 - acc: 0.8482 - auc_roc: 0.74 - ETA: 24s - loss: 0.3747 - acc: 0.8483 - auc_roc: 0.74 - ETA: 24s - loss: 0.3750 - acc: 0.8483 - auc_roc: 0.74 - ETA: 23s - loss: 0.3749 - acc: 0.8483 - auc_roc: 0.74 - ETA: 22s - loss: 0.3747 - acc: 0.8482 - auc_roc: 0.74 - ETA: 21s - loss: 0.3752 - acc: 0.8479 - auc_roc: 0.74 - ETA: 20s - loss: 0.3756 - acc: 0.8474 - auc_roc: 0.74 - ETA: 20s - loss: 0.3758 - acc: 0.8476 - auc_roc: 0.74 - ETA: 19s - loss: 0.3765 - acc: 0.8469 - auc_roc: 0.74 - ETA: 18s - loss: 0.3766 - acc: 0.8467 - auc_roc: 0.74 - ETA: 17s - loss: 0.3768 - acc: 0.8466 - auc_roc: 0.74 - ETA: 16s - loss: 0.3768 - acc: 0.8467 - auc_roc: 0.74 - ETA: 16s - loss: 0.3765 - acc: 0.8469 - auc_roc: 0.74 - ETA: 15s - loss: 0.3763 - acc: 0.8467 - auc_roc: 0.74 - ETA: 14s - loss: 0.3764 - acc: 0.8467 - auc_roc: 0.74 - ETA: 13s - loss: 0.3761 - acc: 0.8467 - auc_roc: 0.74 - ETA: 12s - loss: 0.3756 - acc: 0.8471 - auc_roc: 0.74 - ETA: 12s - loss: 0.3757 - acc: 0.8469 - auc_roc: 0.74 - ETA: 11s - loss: 0.3757 - acc: 0.8470 - auc_roc: 0.74 - ETA: 10s - loss: 0.3754 - acc: 0.8472 - auc_roc: 0.74 - ETA: 9s - loss: 0.3754 - acc: 0.8474 - auc_roc: 0.7420 - ETA: 9s - loss: 0.3750 - acc: 0.8477 - auc_roc: 0.741 - ETA: 8s - loss: 0.3747 - acc: 0.8478 - auc_roc: 0.742 - ETA: 7s - loss: 0.3743 - acc: 0.8482 - auc_roc: 0.742 - ETA: 6s - loss: 0.3738 - acc: 0.8485 - auc_roc: 0.742 - ETA: 5s - loss: 0.3737 - acc: 0.8486 - auc_roc: 0.742 - ETA: 5s - loss: 0.3730 - acc: 0.8490 - auc_roc: 0.742 - ETA: 4s - loss: 0.3728 - acc: 0.8490 - auc_roc: 0.742 - ETA: 3s - loss: 0.3736 - acc: 0.8486 - auc_roc: 0.742 - ETA: 2s - loss: 0.3736 - acc: 0.8485 - auc_roc: 0.742 - ETA: 1s - loss: 0.3734 - acc: 0.8485 - auc_roc: 0.743 - ETA: 1s - loss: 0.3734 - acc: 0.8485 - auc_roc: 0.743 - ETA: 0s - loss: 0.3731 - acc: 0.8488 - auc_roc: 0.743 - 61s 877us/step - loss: 0.3730 - acc: 0.8488 - auc_roc: 0.7436 -

```
val_loss: 0.3810 - val_acc: 0.8493 - val_auc_roc: 0.7407

Epoch 00025: val_auc_roc did not improve from 0.74200
Epoch 26/30
69918/69918 [==============================] - ETA: 57s - loss: 0.3800 - acc:
0.8477 - auc_roc: 0.73 - ETA: 55s - loss: 0.3874 - acc: 0.8442 - auc_roc: 0.72 -
ETA: 53s - loss: 0.3776 - acc: 0.8506 - auc_roc: 0.73 - ETA: 52s - loss: 0.3767
- acc: 0.8489 - auc_roc: 0.73 - ETA: 51s - loss: 0.3804 - acc: 0.8461 - auc_roc:
0.73 - ETA: 50s - loss: 0.3804 - acc: 0.8455 - auc_roc: 0.73 - ETA: 50s - loss:
0.3798 - acc: 0.8458 - auc_roc: 0.73 - ETA: 49s - loss: 0.3772 - acc: 0.8477 -
auc_roc: 0.73 - ETA: 48s - loss: 0.3765 - acc: 0.8482 - auc_roc: 0.73 - ETA: 47s
- loss: 0.3724 - acc: 0.8499 - auc_roc: 0.74 - ETA: 46s - loss: 0.3739 - acc:
0.8493 - auc_roc: 0.74 - ETA: 45s - loss: 0.3723 - acc: 0.8506 - auc_roc: 0.73 -
ETA: 44s - loss: 0.3720 - acc: 0.8499 - auc_roc: 0.74 - ETA: 44s - loss: 0.3762
- acc: 0.8483 - auc_roc: 0.73 - ETA: 43s - loss: 0.3732 - acc: 0.8495 - auc_roc:
0.74 - ETA: 42s - loss: 0.3734 - acc: 0.8489 - auc_roc: 0.74 - ETA: 41s - loss:
0.3741 - acc: 0.8487 - auc_roc: 0.74 - ETA: 40s - loss: 0.3732 - acc: 0.8494 -
auc_roc: 0.74 - ETA: 39s - loss: 0.3736 - acc: 0.8494 - auc_roc: 0.74 - ETA: 39s
- loss: 0.3724 - acc: 0.8496 - auc_roc: 0.74 - ETA: 38s - loss: 0.3728 - acc:
0.8497 - auc_roc: 0.74 - ETA: 37s - loss: 0.3736 - acc: 0.8493 - auc_roc: 0.74 -
ETA: 36s - loss: 0.3740 - acc: 0.8487 - auc_roc: 0.74 - ETA: 35s - loss: 0.3727
- acc: 0.8495 - auc_roc: 0.74 - ETA: 34s - loss: 0.3737 - acc: 0.8495 - auc_roc:
0.73 - ETA: 34s - loss: 0.3723 - acc: 0.8496 - auc_roc: 0.74 - ETA: 33s - loss:
0.3730 - acc: 0.8491 - auc_roc: 0.74 - ETA: 32s - loss: 0.3730 - acc: 0.8491 -
auc_roc: 0.74 - ETA: 31s - loss: 0.3724 - acc: 0.8492 - auc_roc: 0.74 - ETA: 30s
- loss: 0.3726 - acc: 0.8492 - auc_roc: 0.74 - ETA: 29s - loss: 0.3722 - acc:
0.8495 - auc_roc: 0.74 - ETA: 29s - loss: 0.3725 - acc: 0.8490 - auc_roc: 0.74 -
ETA: 28s - loss: 0.3715 - acc: 0.8495 - auc_roc: 0.74 - ETA: 27s - loss: 0.3720
- acc: 0.8489 - auc_roc: 0.74 - ETA: 26s - loss: 0.3715 - acc: 0.8491 - auc_roc:
0.74 - ETA: 25s - loss: 0.3718 - acc: 0.8488 - auc_roc: 0.74 - ETA: 24s - loss:
0.3713 - acc: 0.8490 - auc_roc: 0.74 - ETA: 23s - loss: 0.3716 - acc: 0.8488 -
auc_roc: 0.74 - ETA: 23s - loss: 0.3721 - acc: 0.8488 - auc_roc: 0.74 - ETA: 22s
- loss: 0.3722 - acc: 0.8485 - auc_roc: 0.74 - ETA: 21s - loss: 0.3726 - acc:
0.8483 - auc_roc: 0.74 - ETA: 20s - loss: 0.3731 - acc: 0.8480 - auc_roc: 0.74 -
ETA: 19s - loss: 0.3730 - acc: 0.8480 - auc_roc: 0.74 - ETA: 19s - loss: 0.3735
- acc: 0.8477 - auc_roc: 0.74 - ETA: 18s - loss: 0.3732 - acc: 0.8477 - auc_roc:
0.74 - ETA: 17s - loss: 0.3727 - acc: 0.8482 - auc_roc: 0.74 - ETA: 16s - loss:
0.3736 - acc: 0.8477 - auc_roc: 0.74 - ETA: 15s - loss: 0.3733 - acc: 0.8480 -
auc_roc: 0.74 - ETA: 14s - loss: 0.3730 - acc: 0.8482 - auc_roc: 0.74 - ETA: 14s
- loss: 0.3731 - acc: 0.8479 - auc_roc: 0.74 - ETA: 13s - loss: 0.3731 - acc:
0.8480 - auc_roc: 0.74 - ETA: 12s - loss: 0.3728 - acc: 0.8481 - auc_roc: 0.74 -
ETA: 11s - loss: 0.3728 - acc: 0.8483 - auc_roc: 0.74 - ETA: 10s - loss: 0.3726
- acc: 0.8483 - auc_roc: 0.74 - ETA: 10s - loss: 0.3730 - acc: 0.8482 - auc_roc:
0.74 - ETA: 9s - loss: 0.3730 - acc: 0.8483 - auc_roc: 0.7439 - ETA: 8s - loss:
0.3730 - acc: 0.8483 - auc_roc: 0.744 - ETA: 7s - loss: 0.3725 - acc: 0.8486 -
auc_roc: 0.744 - ETA: 7s - loss: 0.3728 - acc: 0.8485 - auc_roc: 0.744 - ETA: 6s
- loss: 0.3721 - acc: 0.8489 - auc_roc: 0.744 - ETA: 5s - loss: 0.3721 - acc:
0.8489 - auc_roc: 0.744 - ETA: 4s - loss: 0.3723 - acc: 0.8489 - auc_roc: 0.744
```

- ETA: 4s - loss: 0.3718 - acc: 0.8491 - auc_roc: 0.745 - ETA: 3s - loss: 0.3715 - acc: 0.8492 - auc_roc: 0.745 - ETA: 2s - loss: 0.3718 - acc: 0.8492 - auc_roc: 0.745 - ETA: 1s - loss: 0.3715 - acc: 0.8494 - auc_roc: 0.745 - ETA: 0s - loss: 0.3717 - acc: 0.8492 - auc_roc: 0.745 - ETA: 0s - loss: 0.3717 - acc: 0.8492 - auc_roc: 0.745 - 58s 823us/step - loss: 0.3715 - acc: 0.8493 - auc_roc: 0.7455 - val_loss: 0.3771 - val_acc: 0.8502 - val_auc_roc: 0.7423

Epoch 00026: val_auc_roc improved from 0.74200 to 0.74231, saving model to weights-improvement-model2.hdf5
Epoch 27/30
69918/69918 [==============================] - ETA: 48s - loss: 0.3656 - acc: 0.8457 - auc_roc: 0.75 - ETA: 47s - loss: 0.3785 - acc: 0.8433 - auc_roc: 0.74 - ETA: 46s - loss: 0.3745 - acc: 0.8467 - auc_roc: 0.74 - ETA: 45s - loss: 0.3762 - acc: 0.8450 - auc_roc: 0.74 - ETA: 44s - loss: 0.3736 - acc: 0.8455 - auc_roc: 0.75 - ETA: 43s - loss: 0.3750 - acc: 0.8436 - auc_roc: 0.75 - ETA: 42s - loss: 0.3748 - acc: 0.8453 - auc_roc: 0.75 - ETA: 42s - loss: 0.3732 - acc: 0.8462 - auc_roc: 0.75 - ETA: 41s - loss: 0.3693 - acc: 0.8474 - auc_roc: 0.75 - ETA: 40s - loss: 0.3708 - acc: 0.8477 - auc_roc: 0.75 - ETA: 39s - loss: 0.3726 - acc: 0.8477 - auc_roc: 0.74 - ETA: 39s - loss: 0.3741 - acc: 0.8458 - auc_roc: 0.74 - ETA: 38s - loss: 0.3722 - acc: 0.8462 - auc_roc: 0.75 - ETA: 37s - loss: 0.3717 - acc: 0.8465 - auc_roc: 0.75 - ETA: 36s - loss: 0.3731 - acc: 0.8457 - auc_roc: 0.75 - ETA: 36s - loss: 0.3732 - acc: 0.8463 - auc_roc: 0.74 - ETA: 35s - loss: 0.3750 - acc: 0.8459 - auc_roc: 0.74 - ETA: 34s - loss: 0.3736 - acc: 0.8467 - auc_roc: 0.74 - ETA: 34s - loss: 0.3714 - acc: 0.8480 - auc_roc: 0.74 - ETA: 33s - loss: 0.3714 - acc: 0.8483 - auc_roc: 0.74 - ETA: 33s - loss: 0.3716 - acc: 0.8478 - auc_roc: 0.74 - ETA: 32s - loss: 0.3730 - acc: 0.8471 - auc_roc: 0.74 - ETA: 31s - loss: 0.3734 - acc: 0.8472 - auc_roc: 0.74 - ETA: 31s - loss: 0.3728 - acc: 0.8476 - auc_roc: 0.74 - ETA: 30s - loss: 0.3727 - acc: 0.8478 - auc_roc: 0.74 - ETA: 29s - loss: 0.3725 - acc: 0.8477 - auc_roc: 0.74 - ETA: 28s - loss: 0.3737 - acc: 0.8471 - auc_roc: 0.74 - ETA: 28s - loss: 0.3751 - acc: 0.8466 - auc_roc: 0.74 - ETA: 27s - loss: 0.3747 - acc: 0.8468 - auc_roc: 0.74 - ETA: 26s - loss: 0.3743 - acc: 0.8469 - auc_roc: 0.74 - ETA: 26s - loss: 0.3746 - acc: 0.8471 - auc_roc: 0.74 - ETA: 25s - loss: 0.3740 - acc: 0.8476 - auc_roc: 0.74 - ETA: 24s - loss: 0.3744 - acc: 0.8472 - auc_roc: 0.74 - ETA: 24s - loss: 0.3736 - acc: 0.8477 - auc_roc: 0.74 - ETA: 23s - loss: 0.3732 - acc: 0.8477 - auc_roc: 0.74 - ETA: 22s - loss: 0.3727 - acc: 0.8480 - auc_roc: 0.74 - ETA: 22s - loss: 0.3717 - acc: 0.8486 - auc_roc: 0.74 - ETA: 21s - loss: 0.3718 - acc: 0.8485 - auc_roc: 0.74 - ETA: 20s - loss: 0.3718 - acc: 0.8485 - auc_roc: 0.74 - ETA: 20s - loss: 0.3718 - acc: 0.8485 - auc_roc: 0.74 - ETA: 19s - loss: 0.3724 - acc: 0.8482 - auc_roc: 0.74 - ETA: 18s - loss: 0.3725 - acc: 0.8478 - auc_roc: 0.74 - ETA: 17s - loss: 0.3725 - acc: 0.8478 - auc_roc: 0.74 - ETA: 17s - loss: 0.3724 - acc: 0.8479 - auc_roc: 0.74 - ETA: 16s - loss: 0.3730 - acc: 0.8475 - auc_roc: 0.74 - ETA: 15s - loss: 0.3730 - acc: 0.8475 - auc_roc: 0.74 - ETA: 15s - loss: 0.3728 - acc: 0.8476 - auc_roc: 0.74 - ETA: 14s - loss: 0.3724 - acc: 0.8477 - auc_roc: 0.74 - ETA: 13s - loss: 0.3718 - acc: 0.8482 - auc_roc: 0.74 - ETA: 13s - loss: 0.3720 - acc: 0.8481 - auc_roc: 0.74 - ETA: 12s - loss: 0.3719 - acc: 0.8481 - auc_roc: 0.74 - ETA: 11s - loss: 0.3721 - acc: 0.8481 - auc_roc: 0.74 - ETA: 10s - loss: 0.3727 - acc: 0.8476 - auc_roc: 0.74 - ETA: 10s - loss: 0.3730

```
- acc: 0.8475 - auc_roc: 0.74 - ETA: 9s - loss: 0.3729 - acc: 0.8473 - auc_roc:
0.7472 - ETA: 8s - loss: 0.3731 - acc: 0.8473 - auc_roc: 0.747 - ETA: 8s - loss:
0.3724 - acc: 0.8477 - auc_roc: 0.747 - ETA: 7s - loss: 0.3717 - acc: 0.8480 -
auc_roc: 0.747 - ETA: 6s - loss: 0.3718 - acc: 0.8481 - auc_roc: 0.747 - ETA: 5s
- loss: 0.3714 - acc: 0.8483 - auc_roc: 0.747 - ETA: 5s - loss: 0.3716 - acc:
0.8485 - auc_roc: 0.747 - ETA: 4s - loss: 0.3710 - acc: 0.8488 - auc_roc: 0.747
- ETA: 3s - loss: 0.3708 - acc: 0.8489 - auc_roc: 0.747 - ETA: 3s - loss: 0.3709
- acc: 0.8489 - auc_roc: 0.747 - ETA: 2s - loss: 0.3709 - acc: 0.8488 - auc_roc:
0.747 - ETA: 1s - loss: 0.3708 - acc: 0.8489 - auc_roc: 0.747 - ETA: 0s - loss:
0.3711 - acc: 0.8489 - auc_roc: 0.747 - ETA: 0s - loss: 0.3714 - acc: 0.8487 -
auc_roc: 0.746 - 54s 774us/step - loss: 0.3714 - acc: 0.8488 - auc_roc: 0.7468 -
val_loss: 0.3754 - val_acc: 0.8474 - val_auc_roc: 0.7432

Epoch 00027: val_auc_roc improved from 0.74231 to 0.74320, saving model to
weights-improvement-model2.hdf5
Epoch 28/30
69918/69918 [==============================] - ETA: 48s - loss: 0.3778 - acc:
0.8477 - auc_roc: 0.73 - ETA: 45s - loss: 0.3782 - acc: 0.8447 - auc_roc: 0.73 -
ETA: 45s - loss: 0.3701 - acc: 0.8451 - auc_roc: 0.75 - ETA: 44s - loss: 0.3673
- acc: 0.8474 - auc_roc: 0.75 - ETA: 43s - loss: 0.3623 - acc: 0.8523 - auc_roc:
0.75 - ETA: 42s - loss: 0.3668 - acc: 0.8506 - auc_roc: 0.75 - ETA: 41s - loss:
0.3663 - acc: 0.8514 - auc_roc: 0.75 - ETA: 40s - loss: 0.3684 - acc: 0.8508 -
auc_roc: 0.74 - ETA: 39s - loss: 0.3678 - acc: 0.8513 - auc_roc: 0.75 - ETA: 38s
- loss: 0.3716 - acc: 0.8493 - auc_roc: 0.74 - ETA: 38s - loss: 0.3695 - acc:
0.8501 - auc_roc: 0.74 - ETA: 37s - loss: 0.3681 - acc: 0.8507 - auc_roc: 0.75 -
ETA: 36s - loss: 0.3694 - acc: 0.8500 - auc_roc: 0.75 - ETA: 35s - loss: 0.3703
- acc: 0.8491 - auc_roc: 0.75 - ETA: 34s - loss: 0.3695 - acc: 0.8494 - auc_roc:
0.75 - ETA: 34s - loss: 0.3694 - acc: 0.8493 - auc_roc: 0.75 - ETA: 33s - loss:
0.3691 - acc: 0.8492 - auc_roc: 0.75 - ETA: 32s - loss: 0.3690 - acc: 0.8495 -
auc_roc: 0.75 - ETA: 32s - loss: 0.3678 - acc: 0.8502 - auc_roc: 0.75 - ETA: 31s
- loss: 0.3675 - acc: 0.8509 - auc_roc: 0.75 - ETA: 30s - loss: 0.3685 - acc:
0.8504 - auc_roc: 0.75 - ETA: 30s - loss: 0.3683 - acc: 0.8501 - auc_roc: 0.75 -
ETA: 29s - loss: 0.3695 - acc: 0.8494 - auc_roc: 0.75 - ETA: 29s - loss: 0.3683
- acc: 0.8499 - auc_roc: 0.75 - ETA: 28s - loss: 0.3689 - acc: 0.8492 - auc_roc:
0.75 - ETA: 27s - loss: 0.3677 - acc: 0.8498 - auc_roc: 0.75 - ETA: 27s - loss:
0.3668 - acc: 0.8503 - auc_roc: 0.75 - ETA: 26s - loss: 0.3660 - acc: 0.8507 -
auc_roc: 0.75 - ETA: 25s - loss: 0.3655 - acc: 0.8513 - auc_roc: 0.75 - ETA: 25s
- loss: 0.3659 - acc: 0.8511 - auc_roc: 0.75 - ETA: 24s - loss: 0.3665 - acc:
0.8506 - auc_roc: 0.75 - ETA: 23s - loss: 0.3665 - acc: 0.8507 - auc_roc: 0.75 -
ETA: 23s - loss: 0.3659 - acc: 0.8508 - auc_roc: 0.75 - ETA: 22s - loss: 0.3656
- acc: 0.8512 - auc_roc: 0.75 - ETA: 21s - loss: 0.3661 - acc: 0.8509 - auc_roc:
0.75 - ETA: 21s - loss: 0.3656 - acc: 0.8513 - auc_roc: 0.75 - ETA: 20s - loss:
0.3659 - acc: 0.8512 - auc_roc: 0.75 - ETA: 19s - loss: 0.3661 - acc: 0.8511 -
auc_roc: 0.75 - ETA: 19s - loss: 0.3659 - acc: 0.8511 - auc_roc: 0.75 - ETA: 18s
- loss: 0.3660 - acc: 0.8508 - auc_roc: 0.75 - ETA: 17s - loss: 0.3663 - acc:
0.8508 - auc_roc: 0.75 - ETA: 17s - loss: 0.3664 - acc: 0.8509 - auc_roc: 0.75 -
ETA: 16s - loss: 0.3667 - acc: 0.8507 - auc_roc: 0.75 - ETA: 15s - loss: 0.3663
- acc: 0.8509 - auc_roc: 0.75 - ETA: 15s - loss: 0.3665 - acc: 0.8508 - auc_roc:
```

```
0.75 - ETA: 14s - loss: 0.3664 - acc: 0.8508 - auc_roc: 0.75 - ETA: 13s - loss:
0.3666 - acc: 0.8505 - auc_roc: 0.75 - ETA: 13s - loss: 0.3665 - acc: 0.8510 -
auc_roc: 0.75 - ETA: 12s - loss: 0.3669 - acc: 0.8508 - auc_roc: 0.75 - ETA: 11s
- loss: 0.3677 - acc: 0.8504 - auc_roc: 0.75 - ETA: 11s - loss: 0.3679 - acc:
0.8504 - auc_roc: 0.75 - ETA: 10s - loss: 0.3674 - acc: 0.8506 - auc_roc: 0.75 -
ETA: 9s - loss: 0.3678 - acc: 0.8502 - auc_roc: 0.7523 - ETA: 9s - loss: 0.3682
- acc: 0.8500 - auc_roc: 0.752 - ETA: 8s - loss: 0.3686 - acc: 0.8499 - auc_roc:
0.751 - ETA: 7s - loss: 0.3689 - acc: 0.8500 - auc_roc: 0.750 - ETA: 7s - loss:
0.3686 - acc: 0.8502 - auc_roc: 0.751 - ETA: 6s - loss: 0.3683 - acc: 0.8503 -
auc_roc: 0.751 - ETA: 6s - loss: 0.3681 - acc: 0.8505 - auc_roc: 0.751 - ETA: 5s
- loss: 0.3690 - acc: 0.8503 - auc_roc: 0.750 - ETA: 4s - loss: 0.3687 - acc:
0.8507 - auc_roc: 0.750 - ETA: 4s - loss: 0.3690 - acc: 0.8505 - auc_roc: 0.750
- ETA: 3s - loss: 0.3687 - acc: 0.8505 - auc_roc: 0.750 - ETA: 2s - loss: 0.3687
- acc: 0.8505 - auc_roc: 0.750 - ETA: 2s - loss: 0.3688 - acc: 0.8505 - auc_roc:
0.750 - ETA: 1s - loss: 0.3687 - acc: 0.8505 - auc_roc: 0.750 - ETA: 0s - loss:
0.3691 - acc: 0.8503 - auc_roc: 0.750 - ETA: 0s - loss: 0.3695 - acc: 0.8501 -
auc_roc: 0.750 - 50s 710us/step - loss: 0.3695 - acc: 0.8501 - auc_roc: 0.7501 -
val_loss: 0.3756 - val_acc: 0.8490 - val_auc_roc: 0.7448

Epoch 00028: val_auc_roc improved from 0.74320 to 0.74484, saving model to
weights-improvement-model2.hdf5
Epoch 29/30
69918/69918 [==============================] - ETA: 43s - loss: 0.3315 - acc:
0.8711 - auc_roc: 0.77 - ETA: 42s - loss: 0.3288 - acc: 0.8774 - auc_roc: 0.75 -
ETA: 41s - loss: 0.3360 - acc: 0.8678 - auc_roc: 0.77 - ETA: 41s - loss: 0.3446
- acc: 0.8623 - auc_roc: 0.76 - ETA: 40s - loss: 0.3456 - acc: 0.8600 - auc_roc:
0.77 - ETA: 39s - loss: 0.3521 - acc: 0.8561 - auc_roc: 0.76 - ETA: 39s - loss:
0.3487 - acc: 0.8571 - auc_roc: 0.76 - ETA: 38s - loss: 0.3525 - acc: 0.8564 -
auc_roc: 0.76 - ETA: 38s - loss: 0.3538 - acc: 0.8561 - auc_roc: 0.75 - ETA: 37s
- loss: 0.3567 - acc: 0.8553 - auc_roc: 0.75 - ETA: 36s - loss: 0.3602 - acc:
0.8529 - auc_roc: 0.75 - ETA: 36s - loss: 0.3611 - acc: 0.8521 - auc_roc: 0.75 -
ETA: 35s - loss: 0.3606 - acc: 0.8522 - auc_roc: 0.75 - ETA: 35s - loss: 0.3619
- acc: 0.8521 - auc_roc: 0.75 - ETA: 34s - loss: 0.3641 - acc: 0.8506 - auc_roc:
0.75 - ETA: 33s - loss: 0.3638 - acc: 0.8508 - auc_roc: 0.75 - ETA: 33s - loss:
0.3630 - acc: 0.8515 - auc_roc: 0.75 - ETA: 32s - loss: 0.3625 - acc: 0.8514 -
auc_roc: 0.75 - ETA: 32s - loss: 0.3627 - acc: 0.8516 - auc_roc: 0.75 - ETA: 31s
- loss: 0.3634 - acc: 0.8516 - auc_roc: 0.75 - ETA: 30s - loss: 0.3639 - acc:
0.8511 - auc_roc: 0.75 - ETA: 30s - loss: 0.3642 - acc: 0.8511 - auc_roc: 0.75 -
ETA: 29s - loss: 0.3642 - acc: 0.8512 - auc_roc: 0.75 - ETA: 29s - loss: 0.3628
- acc: 0.8521 - auc_roc: 0.75 - ETA: 28s - loss: 0.3644 - acc: 0.8514 - auc_roc:
0.75 - ETA: 27s - loss: 0.3648 - acc: 0.8514 - auc_roc: 0.75 - ETA: 27s - loss:
0.3639 - acc: 0.8519 - auc_roc: 0.75 - ETA: 26s - loss: 0.3642 - acc: 0.8516 -
auc_roc: 0.75 - ETA: 26s - loss: 0.3646 - acc: 0.8515 - auc_roc: 0.75 - ETA: 25s
- loss: 0.3652 - acc: 0.8512 - auc_roc: 0.75 - ETA: 24s - loss: 0.3645 - acc:
0.8516 - auc_roc: 0.75 - ETA: 24s - loss: 0.3642 - acc: 0.8515 - auc_roc: 0.75 -
ETA: 23s - loss: 0.3645 - acc: 0.8513 - auc_roc: 0.75 - ETA: 23s - loss: 0.3654
- acc: 0.8509 - auc_roc: 0.75 - ETA: 22s - loss: 0.3651 - acc: 0.8510 - auc_roc:
0.75 - ETA: 21s - loss: 0.3646 - acc: 0.8514 - auc_roc: 0.75 - ETA: 21s - loss:
```

```
0.3639 - acc: 0.8517 - auc_roc: 0.75 - ETA: 20s - loss: 0.3648 - acc: 0.8513 -
auc_roc: 0.75 - ETA: 19s - loss: 0.3645 - acc: 0.8515 - auc_roc: 0.75 - ETA: 19s
- loss: 0.3641 - acc: 0.8515 - auc_roc: 0.75 - ETA: 18s - loss: 0.3648 - acc:
0.8512 - auc_roc: 0.75 - ETA: 17s - loss: 0.3641 - acc: 0.8515 - auc_roc: 0.75 -
ETA: 17s - loss: 0.3635 - acc: 0.8517 - auc_roc: 0.75 - ETA: 16s - loss: 0.3645
- acc: 0.8511 - auc_roc: 0.75 - ETA: 15s - loss: 0.3648 - acc: 0.8508 - auc_roc:
0.75 - ETA: 15s - loss: 0.3646 - acc: 0.8509 - auc_roc: 0.75 - ETA: 14s - loss:
0.3649 - acc: 0.8508 - auc_roc: 0.75 - ETA: 13s - loss: 0.3659 - acc: 0.8502 -
auc_roc: 0.75 - ETA: 13s - loss: 0.3662 - acc: 0.8499 - auc_roc: 0.75 - ETA: 12s
- loss: 0.3661 - acc: 0.8499 - auc_roc: 0.75 - ETA: 12s - loss: 0.3667 - acc:
0.8496 - auc_roc: 0.75 - ETA: 11s - loss: 0.3663 - acc: 0.8498 - auc_roc: 0.75 -
ETA: 10s - loss: 0.3664 - acc: 0.8496 - auc_roc: 0.75 - ETA: 10s - loss: 0.3667
- acc: 0.8496 - auc_roc: 0.75 - ETA: 9s - loss: 0.3666 - acc: 0.8497 - auc_roc:
0.7543 - ETA: 8s - loss: 0.3665 - acc: 0.8495 - auc_roc: 0.755 - ETA: 8s - loss:
0.3665 - acc: 0.8494 - auc_roc: 0.755 - ETA: 7s - loss: 0.3667 - acc: 0.8495 -
auc_roc: 0.754 - ETA: 6s - loss: 0.3663 - acc: 0.8499 - auc_roc: 0.754 - ETA: 6s
- loss: 0.3667 - acc: 0.8497 - auc_roc: 0.754 - ETA: 5s - loss: 0.3671 - acc:
0.8493 - auc_roc: 0.754 - ETA: 4s - loss: 0.3678 - acc: 0.8489 - auc_roc: 0.754
- ETA: 3s - loss: 0.3678 - acc: 0.8490 - auc_roc: 0.754 - ETA: 3s - loss: 0.3673
- acc: 0.8492 - auc_roc: 0.754 - ETA: 2s - loss: 0.3674 - acc: 0.8490 - auc_roc:
0.755 - ETA: 1s - loss: 0.3673 - acc: 0.8492 - auc_roc: 0.754 - ETA: 0s - loss:
0.3674 - acc: 0.8492 - auc_roc: 0.754 - ETA: 0s - loss: 0.3680 - acc: 0.8490 -
auc_roc: 0.753 - 56s 806us/step - loss: 0.3679 - acc: 0.8490 - auc_roc: 0.7538 -
val_loss: 0.3752 - val_acc: 0.8485 - val_auc_roc: 0.7452

Epoch 00029: val_auc_roc improved from 0.74484 to 0.74521, saving model to
weights-improvement-model2.hdf5
Epoch 30/30
69918/69918 [==============================] - ETA: 51s - loss: 0.3572 - acc:
0.8564 - auc_roc: 0.75 - ETA: 50s - loss: 0.3553 - acc: 0.8594 - auc_roc: 0.75 -
ETA: 49s - loss: 0.3562 - acc: 0.8551 - auc_roc: 0.76 - ETA: 49s - loss: 0.3637
- acc: 0.8508 - auc_roc: 0.75 - ETA: 48s - loss: 0.3553 - acc: 0.8547 - auc_roc:
0.76 - ETA: 48s - loss: 0.3582 - acc: 0.8529 - auc_roc: 0.76 - ETA: 47s - loss:
0.3636 - acc: 0.8518 - auc_roc: 0.75 - ETA: 46s - loss: 0.3654 - acc: 0.8507 -
auc_roc: 0.75 - ETA: 46s - loss: 0.3626 - acc: 0.8506 - auc_roc: 0.76 - ETA: 45s
- loss: 0.3616 - acc: 0.8514 - auc_roc: 0.76 - ETA: 45s - loss: 0.3628 - acc:
0.8506 - auc_roc: 0.76 - ETA: 44s - loss: 0.3618 - acc: 0.8504 - auc_roc: 0.76 -
ETA: 43s - loss: 0.3605 - acc: 0.8512 - auc_roc: 0.76 - ETA: 42s - loss: 0.3600
- acc: 0.8517 - auc_roc: 0.76 - ETA: 41s - loss: 0.3620 - acc: 0.8514 - auc_roc:
0.75 - ETA: 41s - loss: 0.3622 - acc: 0.8512 - auc_roc: 0.75 - ETA: 40s - loss:
0.3614 - acc: 0.8517 - auc_roc: 0.76 - ETA: 39s - loss: 0.3616 - acc: 0.8518 -
auc_roc: 0.75 - ETA: 38s - loss: 0.3627 - acc: 0.8510 - auc_roc: 0.75 - ETA: 37s
- loss: 0.3621 - acc: 0.8512 - auc_roc: 0.75 - ETA: 37s - loss: 0.3616 - acc:
0.8512 - auc_roc: 0.76 - ETA: 36s - loss: 0.3619 - acc: 0.8515 - auc_roc: 0.75 -
ETA: 35s - loss: 0.3638 - acc: 0.8509 - auc_roc: 0.75 - ETA: 34s - loss: 0.3631
- acc: 0.8513 - auc_roc: 0.75 - ETA: 33s - loss: 0.3646 - acc: 0.8511 - auc_roc:
0.75 - ETA: 33s - loss: 0.3657 - acc: 0.8505 - auc_roc: 0.75 - ETA: 32s - loss:
0.3657 - acc: 0.8505 - auc_roc: 0.75 - ETA: 31s - loss: 0.3667 - acc: 0.8502 -
```

```
auc_roc: 0.75 - ETA: 30s - loss: 0.3669 - acc: 0.8501 - auc_roc: 0.75 - ETA: 29s
- loss: 0.3674 - acc: 0.8501 - auc_roc: 0.75 - ETA: 29s - loss: 0.3664 - acc:
0.8504 - auc_roc: 0.75 - ETA: 28s - loss: 0.3655 - acc: 0.8508 - auc_roc: 0.75 -
ETA: 27s - loss: 0.3649 - acc: 0.8510 - auc_roc: 0.75 - ETA: 26s - loss: 0.3641
- acc: 0.8512 - auc_roc: 0.75 - ETA: 25s - loss: 0.3640 - acc: 0.8517 - auc_roc:
0.75 - ETA: 25s - loss: 0.3639 - acc: 0.8515 - auc_roc: 0.75 - ETA: 24s - loss:
0.3645 - acc: 0.8512 - auc_roc: 0.75 - ETA: 23s - loss: 0.3648 - acc: 0.8507 -
auc_roc: 0.75 - ETA: 22s - loss: 0.3650 - acc: 0.8507 - auc_roc: 0.75 - ETA: 21s
- loss: 0.3650 - acc: 0.8509 - auc_roc: 0.75 - ETA: 21s - loss: 0.3652 - acc:
0.8509 - auc_roc: 0.75 - ETA: 20s - loss: 0.3650 - acc: 0.8511 - auc_roc: 0.75 -
ETA: 19s - loss: 0.3649 - acc: 0.8512 - auc_roc: 0.75 - ETA: 18s - loss: 0.3655
- acc: 0.8511 - auc_roc: 0.75 - ETA: 18s - loss: 0.3652 - acc: 0.8511 - auc_roc:
0.75 - ETA: 17s - loss: 0.3647 - acc: 0.8513 - auc_roc: 0.75 - ETA: 16s - loss:
0.3652 - acc: 0.8511 - auc_roc: 0.75 - ETA: 15s - loss: 0.3651 - acc: 0.8512 -
auc_roc: 0.75 - ETA: 14s - loss: 0.3652 - acc: 0.8511 - auc_roc: 0.75 - ETA: 14s
- loss: 0.3650 - acc: 0.8514 - auc_roc: 0.75 - ETA: 13s - loss: 0.3648 - acc:
0.8517 - auc_roc: 0.75 - ETA: 12s - loss: 0.3656 - acc: 0.8511 - auc_roc: 0.75 -
ETA: 11s - loss: 0.3660 - acc: 0.8509 - auc_roc: 0.75 - ETA: 11s - loss: 0.3657
- acc: 0.8510 - auc_roc: 0.75 - ETA: 10s - loss: 0.3656 - acc: 0.8511 - auc_roc:
0.75 - ETA: 9s - loss: 0.3663 - acc: 0.8506 - auc_roc: 0.7536 - ETA: 8s - loss:
0.3668 - acc: 0.8504 - auc_roc: 0.753 - ETA: 7s - loss: 0.3671 - acc: 0.8503 -
auc_roc: 0.753 - ETA: 7s - loss: 0.3670 - acc: 0.8503 - auc_roc: 0.753 - ETA: 6s
- loss: 0.3668 - acc: 0.8505 - auc_roc: 0.753 - ETA: 5s - loss: 0.3666 - acc:
0.8505 - auc_roc: 0.753 - ETA: 4s - loss: 0.3664 - acc: 0.8506 - auc_roc: 0.754
- ETA: 4s - loss: 0.3663 - acc: 0.8504 - auc_roc: 0.754 - ETA: 3s - loss: 0.3660
- acc: 0.8505 - auc_roc: 0.754 - ETA: 2s - loss: 0.3666 - acc: 0.8504 - auc_roc:
0.754 - ETA: 1s - loss: 0.3670 - acc: 0.8502 - auc_roc: 0.753 - ETA: 0s - loss:
0.3677 - acc: 0.8500 - auc_roc: 0.753 - ETA: 0s - loss: 0.3677 - acc: 0.8502 -
auc_roc: 0.752 - 59s 839us/step - loss: 0.3678 - acc: 0.8501 - auc_roc: 0.7526 -
val_loss: 0.3771 - val_acc: 0.8517 - val_auc_roc: 0.7434

Epoch 00030: val_auc_roc did not improve from 0.74521
```

[35]:
```
<keras.callbacks.History at 0x1e0fd4e9128>
```

[36]:
```
merged_model2 = load_model('weights-improvement-model2.hdf5',␣
↪custom_objects={'auc_roc': auc_roc})
```

[37]:
```
result2_train = merged_model2.predict(x=[padded_docs_text_train,␣
↪encoded_docs_school_state_train, encoded_docs_project_grade_category_train,␣
↪encoded_docs_clean_categories_train, encoded_docs_clean_subcategories_train,␣
↪encoded_docs_teacher_prefix_train,␣
↪X_train[['teacher_number_of_previously_posted_projects','price']].
↪as_matrix()])
```

```
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\ipykernel_launcher.py:1: FutureWarning: Method .as_matrix will be
removed in a future version. Use .values instead.
  """Entry point for launching an IPython kernel.
```

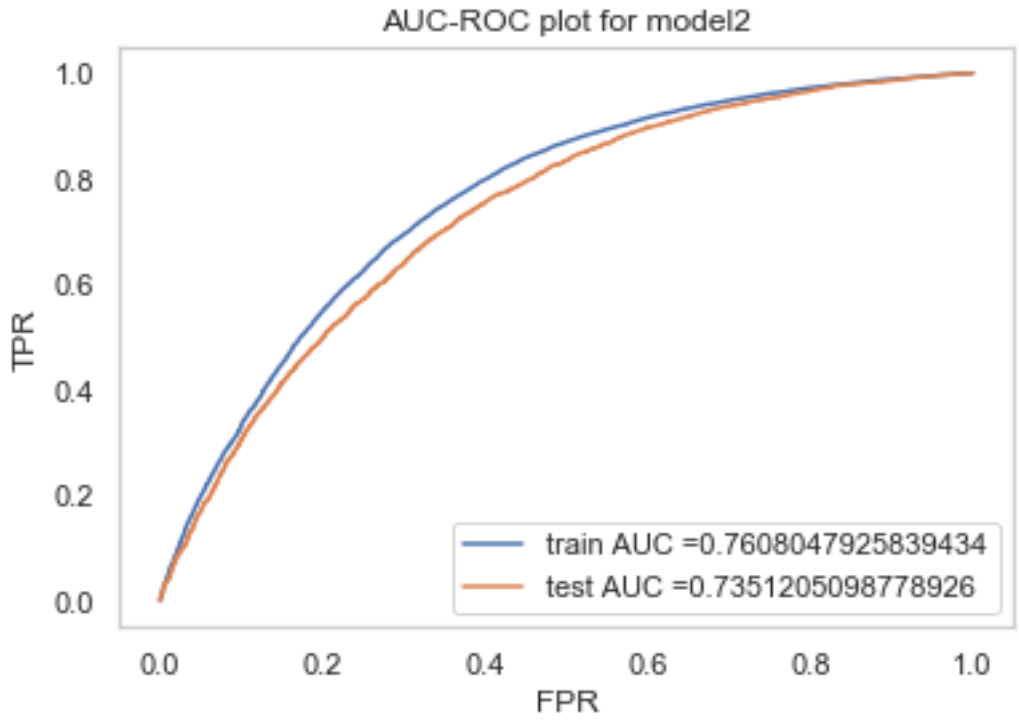
[38]:
```
result2_test = merged_model2.predict(x=[padded_docs_text_test,␣
↪encoded_docs_school_state_test, encoded_docs_project_grade_category_test,␣
↪encoded_docs_clean_categories_test, encoded_docs_clean_subcategories_test,␣
↪encoded_docs_teacher_prefix_test,␣
↪X_test[['teacher_number_of_previously_posted_projects','price']].
↪as_matrix()])
```

```
C:\Users\user\Anaconda3\envs\tensorflow_gpu\lib\site-
packages\ipykernel_launcher.py:1: FutureWarning: Method .as_matrix will be
removed in a future version. Use .values instead.
  """Entry point for launching an IPython kernel.
```

[39]:
```
# https://scikit-learn.org/stable/modules/generated/sklearn.metrics.roc_curve.
↪html#sklearn.metrics.roc_curve
import matplotlib.pyplot as plt
from sklearn.metrics import roc_curve, auc

train_fpr, train_tpr, tr_thresholds = roc_curve(y_train, result2_train)
test_fpr, test_tpr, te_thresholds = roc_curve(y_test, result2_test)

plt.plot(train_fpr, train_tpr, label="train AUC ="+str(auc(train_fpr,␣
↪train_tpr)))
plt.plot(test_fpr, test_tpr, label="test AUC ="+str(auc(test_fpr, test_tpr)))
plt.legend()
plt.xlabel("FPR")
plt.ylabel("TPR")
plt.title("AUC-ROC plot for model2")
plt.grid()
plt.show()
```



4 Model3

[40]:
```
X_train=X_train_copy
X_test=X_test_copy
```

[41]:
```
from sklearn.feature_extraction.text import CountVectorizer
clean_categories_vectorizer =␣
 ↪CountVectorizer(vocabulary=list(set(X_train['clean_categories'].values)),␣
 ↪lowercase=False, binary=True)
clean_categories_vectorizer.fit(X_train['clean_categories'].values)
print(clean_categories_vectorizer.get_feature_names())

#for train data
categories_one_hot_train = clean_categories_vectorizer.
 ↪transform(X_train['clean_categories'].values)
print("Shape of matrix after one hot encodig ",categories_one_hot_train.shape)


#for test
categories_one_hot_test = clean_categories_vectorizer.
 ↪transform(X_test['clean_categories'].values)
print("Shape of matrix after one hot encodig ",categories_one_hot_test.shape)
```

```
['health_sports specialneeds', 'music_arts health_sports', 'math_science warmth
care_hunger', 'music_arts appliedlearning', 'music_arts history_civics',
'specialneeds health_sports', 'math_science appliedlearning', 'warmth
care_hunger', 'history_civics', 'health_sports', 'appliedlearning
history_civics', 'literacy_language appliedlearning', 'literacy_language
music_arts', 'literacy_language math_science', 'math_science literacy_language',
'appliedlearning literacy_language', 'history_civics math_science',
'history_civics appliedlearning', 'health_sports warmth care_hunger',
'specialneeds music_arts', 'history_civics music_arts', 'history_civics
specialneeds', 'health_sports appliedlearning', 'appliedlearning', 'music_arts',
'math_science specialneeds', 'health_sports music_arts', 'history_civics
health_sports', 'health_sports history_civics', 'appliedlearning warmth
care_hunger', 'specialneeds', 'music_arts warmth care_hunger',
'literacy_language health_sports', 'history_civics warmth care_hunger',
'appliedlearning specialneeds', 'math_science', 'appliedlearning math_science',
'appliedlearning health_sports', 'literacy_language', 'math_science
health_sports', 'literacy_language specialneeds', 'music_arts specialneeds',
'specialneeds warmth care_hunger', 'math_science music_arts', 'health_sports
literacy_language', 'literacy_language history_civics', 'appliedlearning
music_arts', 'health_sports math_science', 'history_civics literacy_language',
'literacy_language warmth care_hunger', 'math_science history_civics']
Shape of matrix after one hot encodig  (87398, 51)
Shape of matrix after one hot encodig  (21850, 51)
```

[42]:
```
clean_subcategories_vectorizer =␣
 ↪CountVectorizer(vocabulary=list(set(X_train['clean_subcategories'].values)),␣
 ↪lowercase=False, binary=True)
clean_subcategories_vectorizer.fit(X_train['clean_subcategories'].values)
print(clean_subcategories_vectorizer.get_feature_names())

#for train data
sub_categories_one_hot_train = clean_subcategories_vectorizer.
 ↪transform(X_train['clean_subcategories'].values)
print("Shape of matrix after one hot encodig ",sub_categories_one_hot_train.
 ↪shape)

#for test
sub_categories_one_hot_test = clean_subcategories_vectorizer.
 ↪transform(X_test['clean_subcategories'].values)
print("Shape of matrix after one hot encodig ",sub_categories_one_hot_test.
 ↪shape)
```

```
['foreignlanguages socialsciences', 'charactereducation literacy',
'earlydevelopment history_geography', 'esl nutritioneducation',
'communityservice health_wellness', 'extracurricular gym_fitness',
'appliedsciences warmth care_hunger', 'communityservice environmentalscience',
'civics_government visualarts', 'nutritioneducation', 'appliedsciences other',
```

'extracurricular socialsciences', 'esl earlydevelopment', 'other warmth
care_hunger', 'literacy literature_writing', 'earlydevelopment music',
'communityservice music', 'foreignlanguages mathematics', 'college_careerprep
specialneeds', 'communityservice mathematics', 'mathematics music',
'appliedsciences specialneeds', 'appliedsciences earlydevelopment',
'health_lifescience warmth care_hunger', 'earlydevelopment health_wellness',
'appliedsciences foreignlanguages', 'communityservice performingarts',
'health_lifescience literature_writing', 'literacy warmth care_hunger',
'charactereducation teamsports', 'socialsciences', 'charactereducation
socialsciences', 'college_careerprep socialsciences', 'environmentalscience
music', 'extracurricular teamsports', 'civics_government specialneeds', 'esl
history_geography', 'charactereducation music', 'health_wellness
literature_writing', 'health_lifescience', 'earlydevelopment
health_lifescience', 'college_careerprep visualarts', 'charactereducation
college_careerprep', 'history_geography visualarts', 'civics_government
literacy', 'health_wellness visualarts', 'history_geography socialsciences',
'music performingarts', 'college_careerprep performingarts', 'communityservice
specialneeds', 'environmentalscience teamsports', 'environmentalscience
nutritioneducation', 'communityservice esl', 'mathematics other', 'gym_fitness
socialsciences', 'charactereducation specialneeds', 'other', 'literacy
teamsports', 'communityservice', 'foreignlanguages history_geography',
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literacy', 'foreignlanguages health_wellness', 'charactereducation
extracurricular', 'literature_writing performingarts', 'specialneeds',
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'health_wellness socialsciences', 'earlydevelopment', 'parentinvolvement
visualarts', 'esl mathematics', 'extracurricular mathematics', 'mathematics
teamsports', 'financialliteracy specialneeds', 'appliedsciences', 'mathematics
specialneeds', 'appliedsciences literature_writing', 'communityservice
parentinvolvement', 'environmentalscience warmth care_hunger',
'health_lifescience health_wellness', 'college_careerprep environmentalscience',
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parentinvolvement', 'earlydevelopment economics', 'appliedsciences music', 'esl
parentinvolvement', 'college_careerprep literature_writing',
'charactereducation', 'civics_government history_geography', 'literature_writing
teamsports', 'esl literature_writing', 'esl', 'college_careerprep',
'nutritioneducation teamsports', 'extracurricular nutritioneducation',
'college_careerprep other', 'literature_writing music', 'health_wellness
parentinvolvement', 'literature_writing parentinvolvement', 'nutritioneducation
socialsciences', 'economics specialneeds', 'economics nutritioneducation',
'appliedsciences environmentalscience', 'civics_government economics',
'performingarts visualarts', 'appliedsciences charactereducation',
'appliedsciences economics', 'appliedsciences mathematics', 'literacy music',
'earlydevelopment foreignlanguages', 'earlydevelopment nutritioneducation', 'esl
teamsports', 'mathematics performingarts', 'health_wellness teamsports',
'extracurricular literature_writing', 'foreignlanguages other',
'charactereducation financialliteracy', 'health_lifescience literacy',

'civics_government literature_writing', 'college_careerprep esl',
'charactereducation literature_writing', 'college_careerprep teamsports',
'appliedsciences nutritioneducation', 'environmentalscience performingarts',
'literature_writing other', 'esl music', 'college_careerprep earlydevelopment',
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'health_lifescience specialneeds', 'financialliteracy literature_writing',
'other performingarts', 'literacy specialneeds', 'literacy mathematics',
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literature_writing', 'health_wellness warmth care_hunger', 'foreignlanguages
performingarts', 'economics financialliteracy', 'gym_fitness teamsports',
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performingarts', 'other parentinvolvement', 'health_wellness performingarts',
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visualarts', 'music other', 'literacy', 'parentinvolvement specialneeds', 'esl
health_lifescience', 'civics_government financialliteracy', 'mathematics
parentinvolvement', 'communityservice earlydevelopment', 'literature_writing
nutritioneducation', 'music socialsciences', 'foreignlanguages',
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socialsciences', 'financialliteracy parentinvolvement', 'communityservice
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socialsciences', 'literacy visualarts', 'gym_fitness', 'civics_government
college_careerprep', 'college_careerprep parentinvolvement', 'appliedsciences
communityservice', 'environmentalscience history_geography', 'performingarts',
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'appliedsciences socialsciences', 'nutritioneducation visualarts',
'charactereducation civics_government', 'literacy parentinvolvement',
'communityservice health_lifescience', 'economics socialsciences', 'economics
mathematics', 'earlydevelopment literature_writing', 'civics_government
parentinvolvement', 'health_lifescience visualarts', 'nutritioneducation other',
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visualarts', 'other teamsports', 'mathematics visualarts', 'esl specialneeds',
'other specialneeds', 'foreignlanguages literacy', 'health_wellness
history_geography', 'nutritioneducation warmth care_hunger', 'history_geography

music', 'civics_government extracurricular', 'appliedsciences
financialliteracy', 'civics_government', 'college_careerprep music',
'health_lifescience performingarts', 'economics foreignlanguages',
'college_careerprep extracurricular', 'college_careerprep history_geography',
'charactereducation health_wellness', 'appliedsciences gym_fitness',
'performingarts socialsciences', 'history_geography literature_writing', 'esl
health_wellness', 'charactereducation nutritioneducation', 'specialneeds warmth
care_hunger', 'literature_writing visualarts', 'foreignlanguages visualarts',
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health_wellness', 'appliedsciences civics_government', 'esl gym_fitness',
'financialliteracy', 'history_geography parentinvolvement', 'college_careerprep
financialliteracy', 'college_careerprep foreignlanguages', 'literature_writing
warmth care_hunger', 'mathematics socialsciences', 'economics visualarts',
'communityservice nutritioneducation', 'esl extracurricular', 'warmth
care_hunger', 'civics_government foreignlanguages', 'extracurricular
health_lifescience', 'financialliteracy visualarts', 'civics_government
mathematics', 'communityservice extracurricular', 'health_lifescience other',
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'economics literacy', 'college_careerprep gym_fitness', 'extracurricular
specialneeds', 'history_geography mathematics', 'esl environmentalscience',
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'civics_government socialsciences', 'teamsports', 'visualarts',
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'socialsciences visualarts', 'other socialsciences', 'history_geography
performingarts', 'health_wellness', 'college_careerprep mathematics',
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health_lifescience', 'esl literacy', 'nutritioneducation specialneeds',
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specialneeds', 'parentinvolvement socialsciences', 'appliedsciences
extracurricular', 'music teamsports', 'appliedsciences visualarts',
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socialsciences', 'music parentinvolvement', 'music visualarts', 'economics
environmentalscience', 'visualarts warmth care_hunger', 'foreignlanguages
gym_fitness', 'gym_fitness nutritioneducation', 'environmentalscience literacy',
'socialsciences specialneeds', 'financialliteracy history_geography', 'literacy
other', 'charactereducation esl', 'civics_government performingarts', 'literacy
nutritioneducation', 'extracurricular literacy', 'history_geography other',

```
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'literature_writing specialneeds', 'literacy performingarts',
'charactereducation health_lifescience', 'college_careerprep
health_lifescience', 'financialliteracy health_lifescience', 'charactereducation
earlydevelopment', 'extracurricular foreignlanguages', 'history_geography warmth
care_hunger', 'financialliteracy mathematics', 'gym_fitness other',
'college_careerprep communityservice', 'appliedsciences health_lifescience',
'parentinvolvement teamsports', 'gym_fitness music', 'extracurricular
visualarts', 'financialliteracy literacy', 'appliedsciences college_careerprep',
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'health_lifescience nutritioneducation', 'music', 'literature_writing
mathematics', 'specialneeds visualarts', 'extracurricular',
'environmentalscience gym_fitness', 'teamsports visualarts', 'earlydevelopment
literacy', 'esl financialliteracy', 'economics other', 'gym_fitness literacy',
'charactereducation environmentalscience', 'financialliteracy socialsciences',
'earlydevelopment warmth care_hunger', 'environmentalscience', 'communityservice
history_geography', 'foreignlanguages music', 'charactereducation economics',
'environmentalscience financialliteracy', 'music specialneeds',
'history_geography teamsports', 'earlydevelopment mathematics', 'mathematics
warmth care_hunger']
Shape of matrix after one hot encodig  (87398, 395)
Shape of matrix after one hot encodig  (21850, 395)
```

[43]:
```
# we use count vectorizer to convert the values into one hot encoded features
teacher_prefix_vectorizer =␣
 ↪CountVectorizer(vocabulary=list(set(X_train['teacher_prefix'].values)),␣
 ↪lowercase=False, binary=True)
teacher_prefix_vectorizer.fit(X_train['teacher_prefix'].values)
print(teacher_prefix_vectorizer.get_feature_names())

teacher_prefix_one_hot_train = teacher_prefix_vectorizer.
 ↪transform(X_train['teacher_prefix'].values)
print("Shape of matrix after one hot encodig ",teacher_prefix_one_hot_train.
 ↪shape)

teacher_prefix_one_hot_test = teacher_prefix_vectorizer.
 ↪transform(X_test['teacher_prefix'].values)
print("Shape of matrix after one hot encodig ",teacher_prefix_one_hot_test.
 ↪shape)
```

```
['ms', 'mrs', 'dr', 'teacher', 'mr']
Shape of matrix after one hot encodig  (87398, 5)
Shape of matrix after one hot encodig  (21850, 5)
```

[44]:
```
# we use count vectorizer to convert the values into one hot encoded features
```

```
project_grade_category_vectorizer =␣
 ↪CountVectorizer(vocabulary=list(X_train['project_grade_category'].unique()),␣
 ↪lowercase=False, binary=True)
project_grade_category_vectorizer.fit(X_train['project_grade_category'].values)
print(project_grade_category_vectorizer.get_feature_names())

project_grade_category_one_hot_train = project_grade_category_vectorizer.
 ↪transform(X_train['project_grade_category'].values)
print("Shape of matrix after one hot encodig␣
 ↪",project_grade_category_one_hot_train.shape)

project_grade_category_one_hot_test = project_grade_category_vectorizer.
 ↪transform(X_test['project_grade_category'].values)
print("Shape of matrix after one hot encodig␣
 ↪",project_grade_category_one_hot_test.shape)
```

```
['grades_prek_2', 'grades_6_8', 'grades_3_5', 'grades_9_12']
Shape of matrix after one hot encodig  (87398, 4)
Shape of matrix after one hot encodig  (21850, 4)
```

[45]:
```
# we use count vectorizer to convert the values into one hot encoded features
school_state_vectorizer =␣
 ↪CountVectorizer(vocabulary=list(set(X_train['school_state'].values)),␣
 ↪lowercase=False, binary=True)
school_state_vectorizer.fit(X_train['school_state'].values)
print(school_state_vectorizer.get_feature_names())


school_state_one_hot_train = school_state_vectorizer.
 ↪transform(X_train['school_state'].values)
print("Shape of matrix after one hot encodig ",school_state_one_hot_train.shape)

school_state_one_hot_test = school_state_vectorizer.
 ↪transform(X_test['school_state'].values)
print("Shape of matrix after one hot encodig ",school_state_one_hot_test.shape)
```

```
['de', 'la', 'ne', 'nh', 'mo', 'ky', 'mt', 'pa', 'ut', 'nj', 'nd', 'in', 'ri',
'sc', 'wy', 'nm', 'or', 'ct', 'ma', 'md', 'wa', 'al', 'ak', 'hi', 'nv', 'dc',
'nc', 'ms', 'az', 'tn', 'ga', 'id', 'sd', 'wv', 'ny', 'ca', 'ia', 'ok', 'me',
'oh', 'fl', 'wi', 'mi', 'co', 'va', 'ks', 'mn', 'ar', 'tx', 'il', 'vt']
Shape of matrix after one hot encodig  (87398, 51)
Shape of matrix after one hot encodig  (21850, 51)
```

[46]:
```
# merge two sparse matrices: https://stackoverflow.com/a/19710648/4084039
from scipy.sparse import hstack
```

```
# with the same hstack function we are concatinating a sparse matrix and a␣
 ↪dense matirx :)
model3_other_than_text_train = hstack((categories_one_hot_train,␣
 ↪sub_categories_one_hot_train,school_state_one_hot_train,teacher_prefix_one_hot_train,price_
#print(model3_other_than_text_train.shape)
model3_other_than_text_train = model3_other_than_text_train.toarray()
model3_other_than_text_train = model3_other_than_text_train.reshape((87398,␣
 ↪504,1))
print(model3_other_than_text_train.shape)
model3_other_than_text_test = hstack((categories_one_hot_test,␣
 ↪sub_categories_one_hot_test,school_state_one_hot_test,teacher_prefix_one_hot_test,price_sta
#print(model3_other_than_text_test.shape)
#print(type(model3_other_than_text_test))
model3_other_than_text_test = model3_other_than_text_test.toarray()
#print(type(model3_other_than_text_test))
model3_other_than_text_test = model3_other_than_text_test.reshape((21850,␣
 ↪504,1))
#print(type(model3_other_than_text_test))
print(model3_other_than_text_test.shape)
```

```
(87398, 504, 1)
(21850, 504, 1)
```

[47]:
```
# https://machinelearningmastery.com/
 ↪use-word-embedding-layers-deep-learning-keras/

from keras.preprocessing.sequence import pad_sequences
from keras.preprocessing.text import Tokenizer
import numpy as np
# prepare tokenizer
t = Tokenizer()
t.fit_on_texts(X_train.essay)
vocab_size = len(t.word_index) + 1
# integer encode the documents
encoded_docs_text_train = t.texts_to_sequences(X_train.essay)
#print(encoded_docs)
# pad documents to a max length of 4 words
max_length = 600
padded_docs_text_train = pad_sequences(encoded_docs_text_train,␣
 ↪maxlen=max_length, padding='pre')
#print(padded_docs[0])
print(len(padded_docs_text_train))
print(len(padded_docs_text_train[0]))

# load the whole embedding into memory
embeddings_index = dict()
f = open('glove.42B.300d.txt', 'r', encoding="utf8")
```

```
for line in f:
    values = line.split()
    word = values[0]
    coefs = np.asarray(values[1:], dtype='float32')
    embeddings_index[word] = coefs
f.close()
print('Loaded %s word vectors.' % len(embeddings_index))
# create a weight matrix for words in training docs
embedding_matrix = np.zeros((vocab_size, 300))
for word, i in t.word_index.items():
    embedding_vector = embeddings_index.get(word)
    if embedding_vector is not None:
        embedding_matrix[i] = embedding_vector
```

```
87398
600
Loaded 1917495 word vectors.
```

[48]:
```
encoded_docs_text_test = t.texts_to_sequences(X_test.essay)
#print(encoded_docs)
# pad documents to a max length of 4 words
max_length = 600
padded_docs_text_test = pad_sequences(encoded_docs_text_test,␣
 ↪maxlen=max_length, padding='pre')
#print(padded_docs[0])
print(len(padded_docs_text_train))
print(len(padded_docs_text_train[0]))
```

```
87398
600
```

[49]:
```
from keras.layers import Input, Embedding, LSTM, Dense, concatenate, Flatten
from keras.models import Model
first_input = Input(shape=(600,))
e = Embedding(vocab_size, 300, weights=[embedding_matrix], input_length=600,␣
 ↪trainable=False)(first_input)
lstm_out=LSTM(32)(e)
```

[50]:
```
from keras.layers import Conv1D
model3_other_than_text_test_in = Input(shape=(504,1))
x =␣
 ↪Conv1D(100,5,padding='valid',activation='relu')(model3_other_than_text_test_in)
x = Conv1D(100,3,padding='valid',activation='relu')(x)
model3_other_than_text_out = Flatten()(x)
```

[51]:
```
from keras.layers.merge import concatenate
from keras.models import Model, Sequential
```

```
from keras.layers import Dense, Input, Dropout

concatenated = concatenate([lstm_out, model3_other_than_text_out])
intermediate_out = Dense(1024, activation='relu')(concatenated)
out=Dropout(0.3)(intermediate_out)
out=Dense(512, activation='relu')(out)
out=Dropout(0.3)(out)
out=Dense(128, activation='relu')(out)
out=Dense(1, activation='sigmoid', name='main_output')(out)

merged_model3 = Model(inputs= [first_input, model3_other_than_text_test_in],␣
 ↪outputs=[out])
print(merged_model3.summary())
```

```
____________________________________________________________________________
__________________
Layer (type)                     Output Shape          Param #     Connected to
============================================================================
==================
input_16 (InputLayer)            (None, 504, 1)        0
____________________________________________________________________________
__________________
input_15 (InputLayer)            (None, 600)           0
____________________________________________________________________________
__________________
conv1d_1 (Conv1D)                (None, 500, 100)      600         input_16[0][0]
____________________________________________________________________________
__________________
embedding_13 (Embedding)         (None, 600, 300)      7658100     input_15[0][0]
____________________________________________________________________________
__________________
conv1d_2 (Conv1D)                (None, 498, 100)      30100       conv1d_1[0][0]
____________________________________________________________________________
__________________
lstm_3 (LSTM)                    (None, 32)            42624
embedding_13[0][0]
____________________________________________________________________________
__________________
flatten_11 (Flatten)             (None, 49800)         0           conv1d_2[0][0]
____________________________________________________________________________
__________________
concatenate_3 (Concatenate)      (None, 49832)         0           lstm_3[0][0]
flatten_11[0][0]
____________________________________________________________________________
__________________
dense_9 (Dense)                  (None, 1024)          51028992
concatenate_3[0][0]
```

```
__________________________________________________________________________________
__________________
dropout_5 (Dropout)             (None, 1024)         0           dense_9[0][0]
__________________________________________________________________________________
__________________
dense_10 (Dense)                (None, 512)          524800      dropout_5[0][0]
__________________________________________________________________________________
__________________
dropout_6 (Dropout)             (None, 512)          0           dense_10[0][0]
__________________________________________________________________________________
__________________
dense_11 (Dense)                (None, 128)          65664       dropout_6[0][0]
__________________________________________________________________________________
__________________
main_output (Dense)             (None, 1)            129         dense_11[0][0]
==================================================================================
==================
Total params: 59,351,009
Trainable params: 51,692,909
Non-trainable params: 7,658,100
__________________________________________________________________________________
__________________
None
```

[52]:
```
from time import time
from keras.callbacks import TensorBoard
tensorboard=TensorBoard(log_dir="logs\{}".format(time()))
```

[53]:
```
merged_model3.compile(optimizer='adam',␣
 ↪loss='binary_crossentropy',metrics=["accuracy",auc_roc])
```

[54]:
```
from keras.callbacks import ModelCheckpoint
filepath="weights-improvement-model3.hdf5"
checkpoint = ModelCheckpoint(filepath, verbose=1,monitor="val_auc_roc",␣
 ↪save_best_only=True, mode='max')
callbacks_list = [tensorboard,checkpoint]
```

[55]:
```
merged_model3.fit([padded_docs_text_train, model3_other_than_text_train],␣
 ↪[y_train],epochs=50,␣
 ↪batch_size=1024,callbacks=callbacks_list,validation_split=0.2)
```

```
Train on 69918 samples, validate on 17480 samples
Epoch 1/50
69918/69918 [==============================] - ETA: 4:24 - loss: 0.6935 - acc:
0.4688 - auc_roc: 0.483 - ETA: 2:32 - loss: 0.6232 - acc: 0.6665 - auc_roc:
0.505 - ETA: 1:54 - loss: 0.5672 - acc: 0.7259 - auc_roc: 0.504 - ETA: 1:35 -
loss: 0.5395 - acc: 0.7571 - auc_roc: 0.502 - ETA: 1:23 - loss: 0.5174 - acc:
0.7758 - auc_roc: 0.499 - ETA: 1:15 - loss: 0.4973 - acc: 0.7926 - auc_roc:
0.510 - ETA: 1:09 - loss: 0.4879 - acc: 0.8011 - auc_roc: 0.510 - ETA: 1:04 -
```

```
loss: 0.4839 - acc: 0.8048 - auc_roc: 0.514 - ETA: 1:00 - loss: 0.4820 - acc:
0.8074 - auc_roc: 0.515 - ETA: 57s - loss: 0.4761 - acc: 0.8119 - auc_roc: 0.515
- ETA: 55s - loss: 0.4724 - acc: 0.8151 - auc_roc: 0.51 - ETA: 53s - loss:
0.4672 - acc: 0.8186 - auc_roc: 0.51 - ETA: 50s - loss: 0.4654 - acc: 0.8199 -
auc_roc: 0.52 - ETA: 48s - loss: 0.4623 - acc: 0.8225 - auc_roc: 0.51 - ETA: 47s
- loss: 0.4603 - acc: 0.8238 - auc_roc: 0.52 - ETA: 45s - loss: 0.4566 - acc:
0.8262 - auc_roc: 0.52 - ETA: 44s - loss: 0.4523 - acc: 0.8286 - auc_roc: 0.52 -
ETA: 42s - loss: 0.4496 - acc: 0.8303 - auc_roc: 0.53 - ETA: 41s - loss: 0.4487
- acc: 0.8313 - auc_roc: 0.53 - ETA: 40s - loss: 0.4497 - acc: 0.8312 - auc_roc:
0.53 - ETA: 38s - loss: 0.4503 - acc: 0.8308 - auc_roc: 0.53 - ETA: 37s - loss:
0.4498 - acc: 0.8314 - auc_roc: 0.53 - ETA: 36s - loss: 0.4497 - acc: 0.8318 -
auc_roc: 0.53 - ETA: 35s - loss: 0.4494 - acc: 0.8321 - auc_roc: 0.53 - ETA: 34s
- loss: 0.4485 - acc: 0.8329 - auc_roc: 0.53 - ETA: 33s - loss: 0.4471 - acc:
0.8337 - auc_roc: 0.53 - ETA: 32s - loss: 0.4466 - acc: 0.8341 - auc_roc: 0.53 -
ETA: 31s - loss: 0.4457 - acc: 0.8346 - auc_roc: 0.53 - ETA: 30s - loss: 0.4457
- acc: 0.8348 - auc_roc: 0.54 - ETA: 29s - loss: 0.4447 - acc: 0.8353 - auc_roc:
0.54 - ETA: 28s - loss: 0.4442 - acc: 0.8355 - auc_roc: 0.54 - ETA: 27s - loss:
0.4437 - acc: 0.8358 - auc_roc: 0.54 - ETA: 27s - loss: 0.4431 - acc: 0.8362 -
auc_roc: 0.54 - ETA: 26s - loss: 0.4420 - acc: 0.8367 - auc_roc: 0.54 - ETA: 25s
- loss: 0.4416 - acc: 0.8369 - auc_roc: 0.55 - ETA: 24s - loss: 0.4402 - acc:
0.8377 - auc_roc: 0.55 - ETA: 23s - loss: 0.4404 - acc: 0.8375 - auc_roc: 0.55 -
ETA: 22s - loss: 0.4406 - acc: 0.8375 - auc_roc: 0.55 - ETA: 22s - loss: 0.4394
- acc: 0.8382 - auc_roc: 0.55 - ETA: 21s - loss: 0.4391 - acc: 0.8383 - auc_roc:
0.55 - ETA: 20s - loss: 0.4393 - acc: 0.8379 - auc_roc: 0.56 - ETA: 19s - loss:
0.4393 - acc: 0.8377 - auc_roc: 0.56 - ETA: 18s - loss: 0.4389 - acc: 0.8379 -
auc_roc: 0.56 - ETA: 18s - loss: 0.4377 - acc: 0.8386 - auc_roc: 0.56 - ETA: 17s
- loss: 0.4369 - acc: 0.8390 - auc_roc: 0.56 - ETA: 16s - loss: 0.4364 - acc:
0.8393 - auc_roc: 0.56 - ETA: 15s - loss: 0.4362 - acc: 0.8394 - auc_roc: 0.56 -
ETA: 14s - loss: 0.4360 - acc: 0.8394 - auc_roc: 0.56 - ETA: 14s - loss: 0.4350
- acc: 0.8399 - auc_roc: 0.56 - ETA: 13s - loss: 0.4351 - acc: 0.8398 - auc_roc:
0.57 - ETA: 12s - loss: 0.4345 - acc: 0.8402 - auc_roc: 0.57 - ETA: 11s - loss:
0.4339 - acc: 0.8404 - auc_roc: 0.57 - ETA: 11s - loss: 0.4333 - acc: 0.8406 -
auc_roc: 0.57 - ETA: 10s - loss: 0.4335 - acc: 0.8405 - auc_roc: 0.57 - ETA: 9s
- loss: 0.4335 - acc: 0.8404 - auc_roc: 0.5770 - ETA: 8s - loss: 0.4321 - acc:
0.8410 - auc_roc: 0.579 - ETA: 8s - loss: 0.4321 - acc: 0.8409 - auc_roc: 0.580
- ETA: 7s - loss: 0.4315 - acc: 0.8412 - auc_roc: 0.581 - ETA: 6s - loss: 0.4308
- acc: 0.8414 - auc_roc: 0.583 - ETA: 5s - loss: 0.4309 - acc: 0.8412 - auc_roc:
0.583 - ETA: 5s - loss: 0.4307 - acc: 0.8412 - auc_roc: 0.585 - ETA: 4s - loss:
0.4297 - acc: 0.8416 - auc_roc: 0.586 - ETA: 3s - loss: 0.4292 - acc: 0.8418 -
auc_roc: 0.588 - ETA: 3s - loss: 0.4291 - acc: 0.8418 - auc_roc: 0.588 - ETA: 2s
- loss: 0.4288 - acc: 0.8418 - auc_roc: 0.590 - ETA: 1s - loss: 0.4280 - acc:
0.8422 - auc_roc: 0.591 - ETA: 0s - loss: 0.4275 - acc: 0.8424 - auc_roc: 0.592
- ETA: 0s - loss: 0.4268 - acc: 0.8426 - auc_roc: 0.594 - 55s 783us/step - loss:
0.4265 - acc: 0.8427 - auc_roc: 0.5946 - val_loss: 0.4004 - val_acc: 0.8468 -
val_auc_roc: 0.6843

Epoch 00001: val_auc_roc improved from -inf to 0.68427, saving model to weights-
improvement-model3.hdf5
```

```
Epoch 2/50
69918/69918 [==============================] - ETA: 46s - loss: 0.3865 - acc:
0.8564 - auc_roc: 0.67 - ETA: 45s - loss: 0.3887 - acc: 0.8501 - auc_roc: 0.70 -
ETA: 44s - loss: 0.3862 - acc: 0.8509 - auc_roc: 0.71 - ETA: 43s - loss: 0.3822
- acc: 0.8547 - auc_roc: 0.70 - ETA: 42s - loss: 0.3851 - acc: 0.8525 - auc_roc:
0.70 - ETA: 41s - loss: 0.3883 - acc: 0.8507 - auc_roc: 0.70 - ETA: 40s - loss:
0.3887 - acc: 0.8504 - auc_roc: 0.70 - ETA: 39s - loss: 0.3900 - acc: 0.8500 -
auc_roc: 0.70 - ETA: 39s - loss: 0.3899 - acc: 0.8499 - auc_roc: 0.70 - ETA: 38s
- loss: 0.3909 - acc: 0.8492 - auc_roc: 0.70 - ETA: 37s - loss: 0.3911 - acc:
0.8495 - auc_roc: 0.70 - ETA: 37s - loss: 0.3930 - acc: 0.8485 - auc_roc: 0.70 -
ETA: 36s - loss: 0.3927 - acc: 0.8483 - auc_roc: 0.70 - ETA: 35s - loss: 0.3937
- acc: 0.8475 - auc_roc: 0.70 - ETA: 35s - loss: 0.3957 - acc: 0.8468 - auc_roc:
0.70 - ETA: 34s - loss: 0.3957 - acc: 0.8475 - auc_roc: 0.69 - ETA: 33s - loss:
0.3956 - acc: 0.8478 - auc_roc: 0.69 - ETA: 33s - loss: 0.3954 - acc: 0.8478 -
auc_roc: 0.69 - ETA: 32s - loss: 0.3944 - acc: 0.8480 - auc_roc: 0.69 - ETA: 31s
- loss: 0.3951 - acc: 0.8474 - auc_roc: 0.69 - ETA: 31s - loss: 0.3938 - acc:
0.8477 - auc_roc: 0.70 - ETA: 30s - loss: 0.3932 - acc: 0.8477 - auc_roc: 0.70 -
ETA: 30s - loss: 0.3925 - acc: 0.8485 - auc_roc: 0.69 - ETA: 29s - loss: 0.3921
- acc: 0.8485 - auc_roc: 0.69 - ETA: 28s - loss: 0.3916 - acc: 0.8486 - auc_roc:
0.70 - ETA: 27s - loss: 0.3924 - acc: 0.8481 - auc_roc: 0.69 - ETA: 27s - loss:
0.3928 - acc: 0.8478 - auc_roc: 0.70 - ETA: 26s - loss: 0.3931 - acc: 0.8475 -
auc_roc: 0.70 - ETA: 26s - loss: 0.3933 - acc: 0.8471 - auc_roc: 0.70 - ETA: 25s
- loss: 0.3941 - acc: 0.8465 - auc_roc: 0.70 - ETA: 24s - loss: 0.3937 - acc:
0.8468 - auc_roc: 0.70 - ETA: 24s - loss: 0.3937 - acc: 0.8467 - auc_roc: 0.70 -
ETA: 23s - loss: 0.3929 - acc: 0.8470 - auc_roc: 0.70 - ETA: 22s - loss: 0.3934
- acc: 0.8465 - auc_roc: 0.70 - ETA: 22s - loss: 0.3932 - acc: 0.8467 - auc_roc:
0.70 - ETA: 21s - loss: 0.3937 - acc: 0.8463 - auc_roc: 0.70 - ETA: 20s - loss:
0.3934 - acc: 0.8465 - auc_roc: 0.70 - ETA: 20s - loss: 0.3938 - acc: 0.8464 -
auc_roc: 0.70 - ETA: 19s - loss: 0.3930 - acc: 0.8466 - auc_roc: 0.70 - ETA: 18s
- loss: 0.3922 - acc: 0.8471 - auc_roc: 0.70 - ETA: 18s - loss: 0.3921 - acc:
0.8470 - auc_roc: 0.70 - ETA: 17s - loss: 0.3922 - acc: 0.8469 - auc_roc: 0.70 -
ETA: 16s - loss: 0.3917 - acc: 0.8472 - auc_roc: 0.70 - ETA: 16s - loss: 0.3910
- acc: 0.8474 - auc_roc: 0.70 - ETA: 15s - loss: 0.3912 - acc: 0.8476 - auc_roc:
0.70 - ETA: 14s - loss: 0.3909 - acc: 0.8478 - auc_roc: 0.70 - ETA: 14s - loss:
0.3908 - acc: 0.8478 - auc_roc: 0.70 - ETA: 13s - loss: 0.3905 - acc: 0.8480 -
auc_roc: 0.70 - ETA: 12s - loss: 0.3897 - acc: 0.8481 - auc_roc: 0.70 - ETA: 12s
- loss: 0.3900 - acc: 0.8479 - auc_roc: 0.70 - ETA: 11s - loss: 0.3893 - acc:
0.8482 - auc_roc: 0.70 - ETA: 10s - loss: 0.3897 - acc: 0.8478 - auc_roc: 0.70 -
ETA: 10s - loss: 0.3894 - acc: 0.8480 - auc_roc: 0.70 - ETA: 9s - loss: 0.3893 -
acc: 0.8481 - auc_roc: 0.7080 - ETA: 8s - loss: 0.3885 - acc: 0.8487 - auc_roc:
0.707 - ETA: 8s - loss: 0.3883 - acc: 0.8487 - auc_roc: 0.708 - ETA: 7s - loss:
0.3881 - acc: 0.8488 - auc_roc: 0.708 - ETA: 6s - loss: 0.3886 - acc: 0.8484 -
auc_roc: 0.708 - ETA: 6s - loss: 0.3887 - acc: 0.8484 - auc_roc: 0.708 - ETA: 5s
- loss: 0.3887 - acc: 0.8484 - auc_roc: 0.708 - ETA: 4s - loss: 0.3892 - acc:
0.8479 - auc_roc: 0.709 - ETA: 4s - loss: 0.3890 - acc: 0.8481 - auc_roc: 0.709
- ETA: 3s - loss: 0.3888 - acc: 0.8481 - auc_roc: 0.709 - ETA: 2s - loss: 0.3886
- acc: 0.8480 - auc_roc: 0.710 - ETA: 2s - loss: 0.3882 - acc: 0.8482 - auc_roc:
0.711 - ETA: 1s - loss: 0.3881 - acc: 0.8481 - auc_roc: 0.711 - ETA: 0s - loss:
```

```
0.3875 - acc: 0.8485 - auc_roc: 0.711 - ETA: 0s - loss: 0.3878 - acc: 0.8483 -
auc_roc: 0.711 - 51s 732us/step - loss: 0.3877 - acc: 0.8483 - auc_roc: 0.7117 -
val_loss: 0.3832 - val_acc: 0.8468 - val_auc_roc: 0.7307

Epoch 00002: val_auc_roc improved from 0.68427 to 0.73074, saving model to
weights-improvement-model3.hdf5
Epoch 3/50
69918/69918 [==============================] - ETA: 50s - loss: 0.3737 - acc:
0.8516 - auc_roc: 0.74 - ETA: 47s - loss: 0.3760 - acc: 0.8442 - auc_roc: 0.75 -
ETA: 44s - loss: 0.3729 - acc: 0.8451 - auc_roc: 0.75 - ETA: 44s - loss: 0.3764
- acc: 0.8450 - auc_roc: 0.75 - ETA: 42s - loss: 0.3824 - acc: 0.8432 - auc_roc:
0.74 - ETA: 42s - loss: 0.3818 - acc: 0.8444 - auc_roc: 0.73 - ETA: 41s - loss:
0.3741 - acc: 0.8493 - auc_roc: 0.74 - ETA: 40s - loss: 0.3719 - acc: 0.8499 -
auc_roc: 0.74 - ETA: 39s - loss: 0.3764 - acc: 0.8468 - auc_roc: 0.74 - ETA: 39s
- loss: 0.3759 - acc: 0.8464 - auc_roc: 0.74 - ETA: 38s - loss: 0.3767 - acc:
0.8461 - auc_roc: 0.74 - ETA: 37s - loss: 0.3785 - acc: 0.8456 - auc_roc: 0.74 -
ETA: 37s - loss: 0.3820 - acc: 0.8441 - auc_roc: 0.73 - ETA: 36s - loss: 0.3825
- acc: 0.8441 - auc_roc: 0.73 - ETA: 35s - loss: 0.3813 - acc: 0.8445 - auc_roc:
0.73 - ETA: 35s - loss: 0.3789 - acc: 0.8455 - auc_roc: 0.73 - ETA: 34s - loss:
0.3797 - acc: 0.8455 - auc_roc: 0.73 - ETA: 33s - loss: 0.3804 - acc: 0.8446 -
auc_roc: 0.73 - ETA: 33s - loss: 0.3801 - acc: 0.8448 - auc_roc: 0.73 - ETA: 32s
- loss: 0.3807 - acc: 0.8448 - auc_roc: 0.73 - ETA: 31s - loss: 0.3796 - acc:
0.8459 - auc_roc: 0.73 - ETA: 31s - loss: 0.3801 - acc: 0.8455 - auc_roc: 0.73 -
ETA: 30s - loss: 0.3785 - acc: 0.8463 - auc_roc: 0.73 - ETA: 29s - loss: 0.3775
- acc: 0.8466 - auc_roc: 0.74 - ETA: 29s - loss: 0.3779 - acc: 0.8464 - auc_roc:
0.74 - ETA: 28s - loss: 0.3778 - acc: 0.8469 - auc_roc: 0.73 - ETA: 27s - loss:
0.3779 - acc: 0.8468 - auc_roc: 0.73 - ETA: 27s - loss: 0.3767 - acc: 0.8478 -
auc_roc: 0.73 - ETA: 26s - loss: 0.3774 - acc: 0.8471 - auc_roc: 0.74 - ETA: 25s
- loss: 0.3774 - acc: 0.8474 - auc_roc: 0.73 - ETA: 25s - loss: 0.3770 - acc:
0.8476 - auc_roc: 0.74 - ETA: 24s - loss: 0.3768 - acc: 0.8478 - auc_roc: 0.73 -
ETA: 23s - loss: 0.3764 - acc: 0.8482 - auc_roc: 0.73 - ETA: 23s - loss: 0.3755
- acc: 0.8487 - auc_roc: 0.74 - ETA: 22s - loss: 0.3762 - acc: 0.8484 - auc_roc:
0.74 - ETA: 21s - loss: 0.3758 - acc: 0.8489 - auc_roc: 0.73 - ETA: 21s - loss:
0.3756 - acc: 0.8492 - auc_roc: 0.73 - ETA: 20s - loss: 0.3752 - acc: 0.8495 -
auc_roc: 0.73 - ETA: 19s - loss: 0.3752 - acc: 0.8494 - auc_roc: 0.73 - ETA: 18s
- loss: 0.3756 - acc: 0.8489 - auc_roc: 0.74 - ETA: 18s - loss: 0.3752 - acc:
0.8491 - auc_roc: 0.74 - ETA: 17s - loss: 0.3745 - acc: 0.8494 - auc_roc: 0.74 -
ETA: 17s - loss: 0.3743 - acc: 0.8495 - auc_roc: 0.74 - ETA: 16s - loss: 0.3747
- acc: 0.8493 - auc_roc: 0.74 - ETA: 15s - loss: 0.3747 - acc: 0.8493 - auc_roc:
0.74 - ETA: 15s - loss: 0.3747 - acc: 0.8494 - auc_roc: 0.74 - ETA: 14s - loss:
0.3749 - acc: 0.8494 - auc_roc: 0.74 - ETA: 13s - loss: 0.3742 - acc: 0.8499 -
auc_roc: 0.74 - ETA: 12s - loss: 0.3742 - acc: 0.8499 - auc_roc: 0.74 - ETA: 12s
- loss: 0.3744 - acc: 0.8500 - auc_roc: 0.74 - ETA: 11s - loss: 0.3750 - acc:
0.8497 - auc_roc: 0.74 - ETA: 10s - loss: 0.3750 - acc: 0.8497 - auc_roc: 0.74 -
ETA: 10s - loss: 0.3745 - acc: 0.8500 - auc_roc: 0.74 - ETA: 9s - loss: 0.3743 -
acc: 0.8500 - auc_roc: 0.7429 - ETA: 8s - loss: 0.3748 - acc: 0.8497 - auc_roc:
0.742 - ETA: 8s - loss: 0.3746 - acc: 0.8502 - auc_roc: 0.742 - ETA: 7s - loss:
0.3742 - acc: 0.8504 - auc_roc: 0.742 - ETA: 6s - loss: 0.3735 - acc: 0.8508 -
```

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auc_roc: 0.742 - ETA: 6s - loss: 0.3733 - acc: 0.8510 - auc_roc: 0.742 - ETA: 5s
- loss: 0.3735 - acc: 0.8509 - auc_roc: 0.742 - ETA: 4s - loss: 0.3737 - acc:
0.8510 - auc_roc: 0.742 - ETA: 4s - loss: 0.3741 - acc: 0.8508 - auc_roc: 0.741
- ETA: 3s - loss: 0.3739 - acc: 0.8509 - auc_roc: 0.742 - ETA: 2s - loss: 0.3739
- acc: 0.8509 - auc_roc: 0.742 - ETA: 2s - loss: 0.3740 - acc: 0.8509 - auc_roc:
0.742 - ETA: 1s - loss: 0.3740 - acc: 0.8510 - auc_roc: 0.742 - ETA: 0s - loss:
0.3745 - acc: 0.8508 - auc_roc: 0.741 - ETA: 0s - loss: 0.3742 - acc: 0.8509 -
auc_roc: 0.741 - 52s 738us/step - loss: 0.3742 - acc: 0.8510 - auc_roc: 0.7417 -
val_loss: 0.3735 - val_acc: 0.8523 - val_auc_roc: 0.7431

Epoch 00003: val_auc_roc improved from 0.73074 to 0.74309, saving model to
weights-improvement-model3.hdf5
Epoch 4/50
69918/69918 [==============================] - ETA: 46s - loss: 0.3694 - acc:
0.8516 - auc_roc: 0.75 - ETA: 45s - loss: 0.3697 - acc: 0.8501 - auc_roc: 0.75 -
ETA: 44s - loss: 0.3739 - acc: 0.8483 - auc_roc: 0.75 - ETA: 43s - loss: 0.3752
- acc: 0.8472 - auc_roc: 0.75 - ETA: 42s - loss: 0.3708 - acc: 0.8504 - auc_roc:
0.76 - ETA: 41s - loss: 0.3714 - acc: 0.8504 - auc_roc: 0.76 - ETA: 41s - loss:
0.3733 - acc: 0.8507 - auc_roc: 0.75 - ETA: 40s - loss: 0.3715 - acc: 0.8521 -
auc_roc: 0.75 - ETA: 39s - loss: 0.3675 - acc: 0.8538 - auc_roc: 0.75 - ETA: 39s
- loss: 0.3682 - acc: 0.8540 - auc_roc: 0.75 - ETA: 38s - loss: 0.3687 - acc:
0.8538 - auc_roc: 0.75 - ETA: 37s - loss: 0.3673 - acc: 0.8542 - auc_roc: 0.75 -
ETA: 37s - loss: 0.3669 - acc: 0.8549 - auc_roc: 0.75 - ETA: 36s - loss: 0.3651
- acc: 0.8552 - auc_roc: 0.75 - ETA: 35s - loss: 0.3650 - acc: 0.8554 - auc_roc:
0.75 - ETA: 34s - loss: 0.3662 - acc: 0.8551 - auc_roc: 0.75 - ETA: 34s - loss:
0.3667 - acc: 0.8550 - auc_roc: 0.75 - ETA: 33s - loss: 0.3661 - acc: 0.8548 -
auc_roc: 0.75 - ETA: 33s - loss: 0.3648 - acc: 0.8555 - auc_roc: 0.75 - ETA: 32s
- loss: 0.3650 - acc: 0.8551 - auc_roc: 0.75 - ETA: 31s - loss: 0.3662 - acc:
0.8544 - auc_roc: 0.75 - ETA: 31s - loss: 0.3671 - acc: 0.8537 - auc_roc: 0.75 -
ETA: 30s - loss: 0.3667 - acc: 0.8538 - auc_roc: 0.75 - ETA: 29s - loss: 0.3659
- acc: 0.8547 - auc_roc: 0.75 - ETA: 28s - loss: 0.3649 - acc: 0.8552 - auc_roc:
0.75 - ETA: 28s - loss: 0.3641 - acc: 0.8559 - auc_roc: 0.75 - ETA: 27s - loss:
0.3648 - acc: 0.8559 - auc_roc: 0.75 - ETA: 26s - loss: 0.3639 - acc: 0.8564 -
auc_roc: 0.75 - ETA: 26s - loss: 0.3642 - acc: 0.8561 - auc_roc: 0.75 - ETA: 25s
- loss: 0.3650 - acc: 0.8553 - auc_roc: 0.75 - ETA: 24s - loss: 0.3648 - acc:
0.8554 - auc_roc: 0.75 - ETA: 24s - loss: 0.3650 - acc: 0.8556 - auc_roc: 0.75 -
ETA: 23s - loss: 0.3655 - acc: 0.8554 - auc_roc: 0.75 - ETA: 22s - loss: 0.3656
- acc: 0.8552 - auc_roc: 0.75 - ETA: 22s - loss: 0.3663 - acc: 0.8551 - auc_roc:
0.75 - ETA: 21s - loss: 0.3661 - acc: 0.8555 - auc_roc: 0.75 - ETA: 20s - loss:
0.3657 - acc: 0.8558 - auc_roc: 0.75 - ETA: 20s - loss: 0.3656 - acc: 0.8558 -
auc_roc: 0.75 - ETA: 19s - loss: 0.3663 - acc: 0.8556 - auc_roc: 0.75 - ETA: 18s
- loss: 0.3664 - acc: 0.8554 - auc_roc: 0.75 - ETA: 18s - loss: 0.3661 - acc:
0.8555 - auc_roc: 0.75 - ETA: 17s - loss: 0.3664 - acc: 0.8554 - auc_roc: 0.75 -
ETA: 16s - loss: 0.3660 - acc: 0.8556 - auc_roc: 0.75 - ETA: 16s - loss: 0.3662
- acc: 0.8558 - auc_roc: 0.75 - ETA: 15s - loss: 0.3660 - acc: 0.8557 - auc_roc:
0.75 - ETA: 14s - loss: 0.3658 - acc: 0.8559 - auc_roc: 0.75 - ETA: 14s - loss:
0.3659 - acc: 0.8562 - auc_roc: 0.75 - ETA: 13s - loss: 0.3661 - acc: 0.8558 -
auc_roc: 0.75 - ETA: 12s - loss: 0.3660 - acc: 0.8559 - auc_roc: 0.75 - ETA: 12s
```

```
- loss: 0.3666 - acc: 0.8557 - auc_roc: 0.75 - ETA: 11s - loss: 0.3670 - acc:
0.8554 - auc_roc: 0.75 - ETA: 10s - loss: 0.3671 - acc: 0.8554 - auc_roc: 0.75 -
ETA: 10s - loss: 0.3670 - acc: 0.8554 - auc_roc: 0.75 - ETA: 9s - loss: 0.3666 -
acc: 0.8555 - auc_roc: 0.7540 - ETA: 8s - loss: 0.3663 - acc: 0.8557 - auc_roc:
0.754 - ETA: 8s - loss: 0.3659 - acc: 0.8558 - auc_roc: 0.755 - ETA: 7s - loss:
0.3652 - acc: 0.8562 - auc_roc: 0.755 - ETA: 6s - loss: 0.3650 - acc: 0.8565 -
auc_roc: 0.755 - ETA: 6s - loss: 0.3651 - acc: 0.8564 - auc_roc: 0.755 - ETA: 5s
- loss: 0.3650 - acc: 0.8565 - auc_roc: 0.755 - ETA: 4s - loss: 0.3650 - acc:
0.8563 - auc_roc: 0.755 - ETA: 4s - loss: 0.3652 - acc: 0.8564 - auc_roc: 0.755
- ETA: 3s - loss: 0.3657 - acc: 0.8561 - auc_roc: 0.755 - ETA: 2s - loss: 0.3658
- acc: 0.8561 - auc_roc: 0.754 - ETA: 2s - loss: 0.3662 - acc: 0.8558 - auc_roc:
0.754 - ETA: 1s - loss: 0.3661 - acc: 0.8557 - auc_roc: 0.754 - ETA: 0s - loss:
0.3657 - acc: 0.8558 - auc_roc: 0.755 - ETA: 0s - loss: 0.3655 - acc: 0.8559 -
auc_roc: 0.755 - 51s 733us/step - loss: 0.3655 - acc: 0.8559 - auc_roc: 0.7559 -
val_loss: 0.3711 - val_acc: 0.8537 - val_auc_roc: 0.7506

Epoch 00004: val_auc_roc improved from 0.74309 to 0.75061, saving model to
weights-improvement-model3.hdf5
Epoch 5/50
69918/69918 [==============================] - ETA: 45s - loss: 0.3577 - acc:
0.8613 - auc_roc: 0.76 - ETA: 45s - loss: 0.3460 - acc: 0.8682 - auc_roc: 0.77 -
ETA: 44s - loss: 0.3428 - acc: 0.8688 - auc_roc: 0.77 - ETA: 43s - loss: 0.3419
- acc: 0.8689 - auc_roc: 0.78 - ETA: 42s - loss: 0.3442 - acc: 0.8662 - auc_roc:
0.77 - ETA: 41s - loss: 0.3457 - acc: 0.8657 - auc_roc: 0.78 - ETA: 40s - loss:
0.3428 - acc: 0.8670 - auc_roc: 0.77 - ETA: 40s - loss: 0.3442 - acc: 0.8666 -
auc_roc: 0.77 - ETA: 39s - loss: 0.3458 - acc: 0.8657 - auc_roc: 0.77 - ETA: 38s
- loss: 0.3471 - acc: 0.8649 - auc_roc: 0.77 - ETA: 38s - loss: 0.3507 - acc:
0.8626 - auc_roc: 0.77 - ETA: 37s - loss: 0.3531 - acc: 0.8622 - auc_roc: 0.77 -
ETA: 36s - loss: 0.3533 - acc: 0.8621 - auc_roc: 0.77 - ETA: 36s - loss: 0.3540
- acc: 0.8615 - auc_roc: 0.77 - ETA: 35s - loss: 0.3552 - acc: 0.8609 - auc_roc:
0.77 - ETA: 34s - loss: 0.3576 - acc: 0.8597 - auc_roc: 0.77 - ETA: 34s - loss:
0.3566 - acc: 0.8597 - auc_roc: 0.77 - ETA: 33s - loss: 0.3571 - acc: 0.8590 -
auc_roc: 0.77 - ETA: 32s - loss: 0.3562 - acc: 0.8602 - auc_roc: 0.77 - ETA: 32s
- loss: 0.3565 - acc: 0.8601 - auc_roc: 0.77 - ETA: 31s - loss: 0.3568 - acc:
0.8601 - auc_roc: 0.77 - ETA: 30s - loss: 0.3560 - acc: 0.8604 - auc_roc: 0.77 -
ETA: 30s - loss: 0.3567 - acc: 0.8603 - auc_roc: 0.76 - ETA: 29s - loss: 0.3565
- acc: 0.8603 - auc_roc: 0.76 - ETA: 28s - loss: 0.3571 - acc: 0.8597 - auc_roc:
0.76 - ETA: 28s - loss: 0.3561 - acc: 0.8603 - auc_roc: 0.76 - ETA: 27s - loss:
0.3560 - acc: 0.8605 - auc_roc: 0.76 - ETA: 26s - loss: 0.3562 - acc: 0.8605 -
auc_roc: 0.76 - ETA: 26s - loss: 0.3564 - acc: 0.8604 - auc_roc: 0.76 - ETA: 25s
- loss: 0.3567 - acc: 0.8601 - auc_roc: 0.76 - ETA: 24s - loss: 0.3575 - acc:
0.8597 - auc_roc: 0.76 - ETA: 24s - loss: 0.3565 - acc: 0.8604 - auc_roc: 0.76 -
ETA: 23s - loss: 0.3564 - acc: 0.8605 - auc_roc: 0.76 - ETA: 22s - loss: 0.3563
- acc: 0.8608 - auc_roc: 0.76 - ETA: 22s - loss: 0.3578 - acc: 0.8598 - auc_roc:
0.76 - ETA: 21s - loss: 0.3576 - acc: 0.8598 - auc_roc: 0.76 - ETA: 20s - loss:
0.3577 - acc: 0.8596 - auc_roc: 0.76 - ETA: 20s - loss: 0.3574 - acc: 0.8598 -
auc_roc: 0.76 - ETA: 19s - loss: 0.3582 - acc: 0.8592 - auc_roc: 0.76 - ETA: 18s
- loss: 0.3591 - acc: 0.8588 - auc_roc: 0.76 - ETA: 18s - loss: 0.3594 - acc:
```

```
0.8587 - auc_roc: 0.76 - ETA: 17s - loss: 0.3599 - acc: 0.8583 - auc_roc: 0.76 -
ETA: 16s - loss: 0.3597 - acc: 0.8586 - auc_roc: 0.76 - ETA: 16s - loss: 0.3602
- acc: 0.8583 - auc_roc: 0.76 - ETA: 15s - loss: 0.3605 - acc: 0.8583 - auc_roc:
0.76 - ETA: 14s - loss: 0.3603 - acc: 0.8585 - auc_roc: 0.76 - ETA: 14s - loss:
0.3608 - acc: 0.8584 - auc_roc: 0.76 - ETA: 13s - loss: 0.3612 - acc: 0.8581 -
auc_roc: 0.76 - ETA: 12s - loss: 0.3617 - acc: 0.8576 - auc_roc: 0.76 - ETA: 12s
- loss: 0.3619 - acc: 0.8577 - auc_roc: 0.76 - ETA: 11s - loss: 0.3621 - acc:
0.8576 - auc_roc: 0.76 - ETA: 10s - loss: 0.3623 - acc: 0.8576 - auc_roc: 0.76 -
ETA: 10s - loss: 0.3619 - acc: 0.8576 - auc_roc: 0.76 - ETA: 9s - loss: 0.3615 -
acc: 0.8578 - auc_roc: 0.7661 - ETA: 8s - loss: 0.3614 - acc: 0.8578 - auc_roc:
0.766 - ETA: 8s - loss: 0.3607 - acc: 0.8581 - auc_roc: 0.767 - ETA: 7s - loss:
0.3607 - acc: 0.8581 - auc_roc: 0.767 - ETA: 6s - loss: 0.3606 - acc: 0.8581 -
auc_roc: 0.767 - ETA: 6s - loss: 0.3605 - acc: 0.8581 - auc_roc: 0.767 - ETA: 5s
- loss: 0.3608 - acc: 0.8580 - auc_roc: 0.767 - ETA: 4s - loss: 0.3608 - acc:
0.8581 - auc_roc: 0.767 - ETA: 4s - loss: 0.3607 - acc: 0.8580 - auc_roc: 0.767
- ETA: 3s - loss: 0.3604 - acc: 0.8581 - auc_roc: 0.767 - ETA: 2s - loss: 0.3602
- acc: 0.8582 - auc_roc: 0.767 - ETA: 2s - loss: 0.3605 - acc: 0.8581 - auc_roc:
0.766 - ETA: 1s - loss: 0.3602 - acc: 0.8583 - auc_roc: 0.766 - ETA: 0s - loss:
0.3598 - acc: 0.8584 - auc_roc: 0.767 - ETA: 0s - loss: 0.3597 - acc: 0.8584 -
auc_roc: 0.767 - 51s 732us/step - loss: 0.3596 - acc: 0.8583 - auc_roc: 0.7674 -
val_loss: 0.3696 - val_acc: 0.8538 - val_auc_roc: 0.7513

Epoch 00005: val_auc_roc improved from 0.75061 to 0.75125, saving model to
weights-improvement-model3.hdf5
Epoch 6/50
69918/69918 [==============================] - ETA: 46s - loss: 0.3644 - acc:
0.8525 - auc_roc: 0.76 - ETA: 45s - loss: 0.3781 - acc: 0.8447 - auc_roc: 0.75 -
ETA: 43s - loss: 0.3667 - acc: 0.8496 - auc_roc: 0.77 - ETA: 42s - loss: 0.3659
- acc: 0.8506 - auc_roc: 0.77 - ETA: 42s - loss: 0.3638 - acc: 0.8535 - auc_roc:
0.77 - ETA: 41s - loss: 0.3681 - acc: 0.8535 - auc_roc: 0.76 - ETA: 40s - loss:
0.3658 - acc: 0.8552 - auc_roc: 0.76 - ETA: 40s - loss: 0.3637 - acc: 0.8546 -
auc_roc: 0.77 - ETA: 39s - loss: 0.3603 - acc: 0.8571 - auc_roc: 0.77 - ETA: 38s
- loss: 0.3623 - acc: 0.8561 - auc_roc: 0.77 - ETA: 38s - loss: 0.3573 - acc:
0.8585 - auc_roc: 0.77 - ETA: 37s - loss: 0.3612 - acc: 0.8564 - auc_roc: 0.77 -
ETA: 36s - loss: 0.3618 - acc: 0.8563 - auc_roc: 0.77 - ETA: 36s - loss: 0.3635
- acc: 0.8553 - auc_roc: 0.77 - ETA: 35s - loss: 0.3642 - acc: 0.8553 - auc_roc:
0.77 - ETA: 34s - loss: 0.3649 - acc: 0.8552 - auc_roc: 0.77 - ETA: 34s - loss:
0.3636 - acc: 0.8559 - auc_roc: 0.77 - ETA: 33s - loss: 0.3611 - acc: 0.8572 -
auc_roc: 0.77 - ETA: 32s - loss: 0.3607 - acc: 0.8575 - auc_roc: 0.77 - ETA: 32s
- loss: 0.3606 - acc: 0.8571 - auc_roc: 0.77 - ETA: 31s - loss: 0.3603 - acc:
0.8576 - auc_roc: 0.77 - ETA: 30s - loss: 0.3600 - acc: 0.8577 - auc_roc: 0.77 -
ETA: 30s - loss: 0.3587 - acc: 0.8584 - auc_roc: 0.77 - ETA: 29s - loss: 0.3579
- acc: 0.8588 - auc_roc: 0.77 - ETA: 28s - loss: 0.3584 - acc: 0.8590 - auc_roc:
0.77 - ETA: 28s - loss: 0.3592 - acc: 0.8588 - auc_roc: 0.77 - ETA: 27s - loss:
0.3593 - acc: 0.8584 - auc_roc: 0.77 - ETA: 26s - loss: 0.3591 - acc: 0.8585 -
auc_roc: 0.77 - ETA: 26s - loss: 0.3589 - acc: 0.8585 - auc_roc: 0.77 - ETA: 25s
- loss: 0.3580 - acc: 0.8591 - auc_roc: 0.77 - ETA: 24s - loss: 0.3574 - acc:
0.8594 - auc_roc: 0.77 - ETA: 24s - loss: 0.3566 - acc: 0.8597 - auc_roc: 0.77 -
```

```
ETA: 23s - loss: 0.3576 - acc: 0.8595 - auc_roc: 0.77 - ETA: 22s - loss: 0.3586
- acc: 0.8588 - auc_roc: 0.77 - ETA: 22s - loss: 0.3591 - acc: 0.8585 - auc_roc:
0.77 - ETA: 21s - loss: 0.3585 - acc: 0.8590 - auc_roc: 0.77 - ETA: 20s - loss:
0.3582 - acc: 0.8595 - auc_roc: 0.77 - ETA: 20s - loss: 0.3578 - acc: 0.8596 -
auc_roc: 0.77 - ETA: 19s - loss: 0.3577 - acc: 0.8598 - auc_roc: 0.77 - ETA: 18s
- loss: 0.3581 - acc: 0.8595 - auc_roc: 0.77 - ETA: 18s - loss: 0.3582 - acc:
0.8594 - auc_roc: 0.77 - ETA: 17s - loss: 0.3585 - acc: 0.8594 - auc_roc: 0.77 -
ETA: 16s - loss: 0.3578 - acc: 0.8597 - auc_roc: 0.77 - ETA: 16s - loss: 0.3581
- acc: 0.8593 - auc_roc: 0.77 - ETA: 15s - loss: 0.3583 - acc: 0.8591 - auc_roc:
0.77 - ETA: 14s - loss: 0.3589 - acc: 0.8589 - auc_roc: 0.77 - ETA: 14s - loss:
0.3590 - acc: 0.8588 - auc_roc: 0.77 - ETA: 13s - loss: 0.3593 - acc: 0.8588 -
auc_roc: 0.77 - ETA: 12s - loss: 0.3594 - acc: 0.8588 - auc_roc: 0.77 - ETA: 12s
- loss: 0.3592 - acc: 0.8588 - auc_roc: 0.77 - ETA: 11s - loss: 0.3590 - acc:
0.8586 - auc_roc: 0.77 - ETA: 10s - loss: 0.3587 - acc: 0.8588 - auc_roc: 0.77 -
ETA: 10s - loss: 0.3591 - acc: 0.8585 - auc_roc: 0.77 - ETA: 9s - loss: 0.3592 -
acc: 0.8584 - auc_roc: 0.7726 - ETA: 8s - loss: 0.3583 - acc: 0.8589 - auc_roc:
0.772 - ETA: 8s - loss: 0.3577 - acc: 0.8593 - auc_roc: 0.772 - ETA: 7s - loss:
0.3570 - acc: 0.8595 - auc_roc: 0.773 - ETA: 6s - loss: 0.3568 - acc: 0.8596 -
auc_roc: 0.773 - ETA: 6s - loss: 0.3565 - acc: 0.8598 - auc_roc: 0.773 - ETA: 5s
- loss: 0.3564 - acc: 0.8599 - auc_roc: 0.773 - ETA: 4s - loss: 0.3557 - acc:
0.8603 - auc_roc: 0.774 - ETA: 4s - loss: 0.3557 - acc: 0.8603 - auc_roc: 0.774
- ETA: 3s - loss: 0.3562 - acc: 0.8601 - auc_roc: 0.774 - ETA: 2s - loss: 0.3558
- acc: 0.8602 - auc_roc: 0.774 - ETA: 2s - loss: 0.3558 - acc: 0.8602 - auc_roc:
0.774 - ETA: 1s - loss: 0.3556 - acc: 0.8602 - auc_roc: 0.775 - ETA: 0s - loss:
0.3552 - acc: 0.8604 - auc_roc: 0.775 - ETA: 0s - loss: 0.3551 - acc: 0.8603 -
auc_roc: 0.776 - 51s 729us/step - loss: 0.3551 - acc: 0.8603 - auc_roc: 0.7761 -
val_loss: 0.3732 - val_acc: 0.8510 - val_auc_roc: 0.7551

Epoch 00006: val_auc_roc improved from 0.75125 to 0.75505, saving model to
weights-improvement-model3.hdf5
Epoch 7/50
69918/69918 [==============================] - ETA: 46s - loss: 0.3377 - acc:
0.8711 - auc_roc: 0.79 - ETA: 44s - loss: 0.3467 - acc: 0.8633 - auc_roc: 0.79 -
ETA: 43s - loss: 0.3403 - acc: 0.8669 - auc_roc: 0.78 - ETA: 42s - loss: 0.3288
- acc: 0.8694 - auc_roc: 0.79 - ETA: 41s - loss: 0.3341 - acc: 0.8674 - auc_roc:
0.79 - ETA: 41s - loss: 0.3331 - acc: 0.8687 - auc_roc: 0.79 - ETA: 40s - loss:
0.3393 - acc: 0.8655 - auc_roc: 0.79 - ETA: 39s - loss: 0.3399 - acc: 0.8677 -
auc_roc: 0.79 - ETA: 38s - loss: 0.3398 - acc: 0.8684 - auc_roc: 0.79 - ETA: 38s
- loss: 0.3385 - acc: 0.8692 - auc_roc: 0.79 - ETA: 37s - loss: 0.3409 - acc:
0.8686 - auc_roc: 0.78 - ETA: 36s - loss: 0.3406 - acc: 0.8689 - auc_roc: 0.79 -
ETA: 36s - loss: 0.3405 - acc: 0.8688 - auc_roc: 0.79 - ETA: 35s - loss: 0.3415
- acc: 0.8681 - auc_roc: 0.79 - ETA: 35s - loss: 0.3412 - acc: 0.8685 - auc_roc:
0.79 - ETA: 34s - loss: 0.3410 - acc: 0.8683 - auc_roc: 0.79 - ETA: 33s - loss:
0.3408 - acc: 0.8686 - auc_roc: 0.79 - ETA: 33s - loss: 0.3414 - acc: 0.8675 -
auc_roc: 0.79 - ETA: 32s - loss: 0.3425 - acc: 0.8673 - auc_roc: 0.79 - ETA: 32s
- loss: 0.3426 - acc: 0.8671 - auc_roc: 0.79 - ETA: 31s - loss: 0.3430 - acc:
0.8667 - auc_roc: 0.79 - ETA: 30s - loss: 0.3434 - acc: 0.8670 - auc_roc: 0.78 -
ETA: 30s - loss: 0.3428 - acc: 0.8672 - auc_roc: 0.78 - ETA: 29s - loss: 0.3433
```

- acc: 0.8669 - auc_roc: 0.78 - ETA: 28s - loss: 0.3434 - acc: 0.8664 - auc_roc:
0.79 - ETA: 28s - loss: 0.3440 - acc: 0.8659 - auc_roc: 0.79 - ETA: 27s - loss:
0.3454 - acc: 0.8657 - auc_roc: 0.78 - ETA: 27s - loss: 0.3456 - acc: 0.8656 -
auc_roc: 0.78 - ETA: 26s - loss: 0.3456 - acc: 0.8655 - auc_roc: 0.78 - ETA: 25s
- loss: 0.3467 - acc: 0.8651 - auc_roc: 0.78 - ETA: 25s - loss: 0.3466 - acc:
0.8650 - auc_roc: 0.78 - ETA: 24s - loss: 0.3467 - acc: 0.8653 - auc_roc: 0.78 -
ETA: 23s - loss: 0.3472 - acc: 0.8648 - auc_roc: 0.78 - ETA: 22s - loss: 0.3474
- acc: 0.8646 - auc_roc: 0.78 - ETA: 22s - loss: 0.3473 - acc: 0.8646 - auc_roc:
0.78 - ETA: 21s - loss: 0.3463 - acc: 0.8651 - auc_roc: 0.78 - ETA: 20s - loss:
0.3463 - acc: 0.8649 - auc_roc: 0.78 - ETA: 20s - loss: 0.3470 - acc: 0.8648 -
auc_roc: 0.78 - ETA: 19s - loss: 0.3472 - acc: 0.8646 - auc_roc: 0.78 - ETA: 18s
- loss: 0.3477 - acc: 0.8642 - auc_roc: 0.78 - ETA: 18s - loss: 0.3477 - acc:
0.8641 - auc_roc: 0.78 - ETA: 17s - loss: 0.3482 - acc: 0.8640 - auc_roc: 0.78 -
ETA: 16s - loss: 0.3486 - acc: 0.8638 - auc_roc: 0.78 - ETA: 16s - loss: 0.3490
- acc: 0.8636 - auc_roc: 0.78 - ETA: 15s - loss: 0.3490 - acc: 0.8637 - auc_roc:
0.78 - ETA: 14s - loss: 0.3497 - acc: 0.8632 - auc_roc: 0.78 - ETA: 14s - loss:
0.3493 - acc: 0.8634 - auc_roc: 0.78 - ETA: 13s - loss: 0.3497 - acc: 0.8631 -
auc_roc: 0.78 - ETA: 12s - loss: 0.3501 - acc: 0.8629 - auc_roc: 0.78 - ETA: 12s
- loss: 0.3502 - acc: 0.8629 - auc_roc: 0.78 - ETA: 11s - loss: 0.3507 - acc:
0.8626 - auc_roc: 0.78 - ETA: 10s - loss: 0.3505 - acc: 0.8627 - auc_roc: 0.78 -
ETA: 10s - loss: 0.3501 - acc: 0.8629 - auc_roc: 0.78 - ETA: 9s - loss: 0.3496 -
acc: 0.8631 - auc_roc: 0.7844 - ETA: 8s - loss: 0.3501 - acc: 0.8629 - auc_roc:
0.784 - ETA: 8s - loss: 0.3501 - acc: 0.8629 - auc_roc: 0.784 - ETA: 7s - loss:
0.3511 - acc: 0.8623 - auc_roc: 0.783 - ETA: 6s - loss: 0.3510 - acc: 0.8622 -
auc_roc: 0.783 - ETA: 6s - loss: 0.3508 - acc: 0.8623 - auc_roc: 0.783 - ETA: 5s
- loss: 0.3508 - acc: 0.8623 - auc_roc: 0.783 - ETA: 4s - loss: 0.3510 - acc:
0.8623 - auc_roc: 0.784 - ETA: 4s - loss: 0.3507 - acc: 0.8625 - auc_roc: 0.783
- ETA: 3s - loss: 0.3507 - acc: 0.8624 - auc_roc: 0.783 - ETA: 2s - loss: 0.3513
- acc: 0.8620 - auc_roc: 0.783 - ETA: 2s - loss: 0.3512 - acc: 0.8621 - auc_roc:
0.783 - ETA: 1s - loss: 0.3513 - acc: 0.8620 - auc_roc: 0.783 - ETA: 0s - loss:
0.3512 - acc: 0.8620 - auc_roc: 0.783 - ETA: 0s - loss: 0.3514 - acc: 0.8620 -
auc_roc: 0.783 - 51s 731us/step - loss: 0.3512 - acc: 0.8622 - auc_roc: 0.7836 -
val_loss: 0.3698 - val_acc: 0.8529 - val_auc_roc: 0.7551

Epoch 00007: val_auc_roc improved from 0.75505 to 0.75507, saving model to
weights-improvement-model3.hdf5
Epoch 8/50
69918/69918 [==============================] - ETA: 46s - loss: 0.3411 - acc:
0.8721 - auc_roc: 0.79 - ETA: 46s - loss: 0.3433 - acc: 0.8633 - auc_roc: 0.80 -
ETA: 45s - loss: 0.3421 - acc: 0.8652 - auc_roc: 0.79 - ETA: 43s - loss: 0.3479
- acc: 0.8621 - auc_roc: 0.78 - ETA: 42s - loss: 0.3547 - acc: 0.8613 - auc_roc:
0.78 - ETA: 42s - loss: 0.3542 - acc: 0.8615 - auc_roc: 0.78 - ETA: 41s - loss:
0.3569 - acc: 0.8604 - auc_roc: 0.77 - ETA: 40s - loss: 0.3566 - acc: 0.8611 -
auc_roc: 0.77 - ETA: 40s - loss: 0.3563 - acc: 0.8614 - auc_roc: 0.78 - ETA: 39s
- loss: 0.3541 - acc: 0.8616 - auc_roc: 0.78 - ETA: 38s - loss: 0.3528 - acc:
0.8621 - auc_roc: 0.78 - ETA: 38s - loss: 0.3500 - acc: 0.8630 - auc_roc: 0.78 -
ETA: 37s - loss: 0.3489 - acc: 0.8637 - auc_roc: 0.78 - ETA: 36s - loss: 0.3510
- acc: 0.8624 - auc_roc: 0.78 - ETA: 35s - loss: 0.3511 - acc: 0.8625 - auc_roc:

```
0.78 - ETA: 35s - loss: 0.3509 - acc: 0.8627 - auc_roc: 0.78 - ETA: 34s - loss:
0.3509 - acc: 0.8620 - auc_roc: 0.78 - ETA: 33s - loss: 0.3509 - acc: 0.8621 -
auc_roc: 0.78 - ETA: 33s - loss: 0.3503 - acc: 0.8626 - auc_roc: 0.78 - ETA: 32s
- loss: 0.3497 - acc: 0.8628 - auc_roc: 0.78 - ETA: 31s - loss: 0.3485 - acc:
0.8632 - auc_roc: 0.78 - ETA: 30s - loss: 0.3487 - acc: 0.8627 - auc_roc: 0.78 -
ETA: 30s - loss: 0.3478 - acc: 0.8634 - auc_roc: 0.78 - ETA: 29s - loss: 0.3472
- acc: 0.8636 - auc_roc: 0.78 - ETA: 28s - loss: 0.3479 - acc: 0.8626 - auc_roc:
0.79 - ETA: 28s - loss: 0.3476 - acc: 0.8629 - auc_roc: 0.79 - ETA: 27s - loss:
0.3475 - acc: 0.8630 - auc_roc: 0.79 - ETA: 26s - loss: 0.3465 - acc: 0.8635 -
auc_roc: 0.79 - ETA: 26s - loss: 0.3463 - acc: 0.8637 - auc_roc: 0.79 - ETA: 25s
- loss: 0.3471 - acc: 0.8633 - auc_roc: 0.79 - ETA: 24s - loss: 0.3467 - acc:
0.8637 - auc_roc: 0.79 - ETA: 24s - loss: 0.3463 - acc: 0.8639 - auc_roc: 0.79 -
ETA: 23s - loss: 0.3457 - acc: 0.8642 - auc_roc: 0.79 - ETA: 22s - loss: 0.3455
- acc: 0.8641 - auc_roc: 0.79 - ETA: 22s - loss: 0.3451 - acc: 0.8643 - auc_roc:
0.79 - ETA: 21s - loss: 0.3444 - acc: 0.8646 - auc_roc: 0.79 - ETA: 20s - loss:
0.3446 - acc: 0.8644 - auc_roc: 0.79 - ETA: 20s - loss: 0.3443 - acc: 0.8643 -
auc_roc: 0.79 - ETA: 19s - loss: 0.3443 - acc: 0.8643 - auc_roc: 0.79 - ETA: 18s
- loss: 0.3450 - acc: 0.8639 - auc_roc: 0.79 - ETA: 18s - loss: 0.3453 - acc:
0.8639 - auc_roc: 0.79 - ETA: 17s - loss: 0.3455 - acc: 0.8637 - auc_roc: 0.79 -
ETA: 16s - loss: 0.3451 - acc: 0.8638 - auc_roc: 0.79 - ETA: 16s - loss: 0.3452
- acc: 0.8636 - auc_roc: 0.79 - ETA: 15s - loss: 0.3450 - acc: 0.8637 - auc_roc:
0.79 - ETA: 14s - loss: 0.3450 - acc: 0.8639 - auc_roc: 0.79 - ETA: 14s - loss:
0.3450 - acc: 0.8640 - auc_roc: 0.79 - ETA: 13s - loss: 0.3451 - acc: 0.8640 -
auc_roc: 0.79 - ETA: 12s - loss: 0.3450 - acc: 0.8641 - auc_roc: 0.79 - ETA: 12s
- loss: 0.3452 - acc: 0.8640 - auc_roc: 0.79 - ETA: 11s - loss: 0.3452 - acc:
0.8641 - auc_roc: 0.79 - ETA: 10s - loss: 0.3445 - acc: 0.8644 - auc_roc: 0.79 -
ETA: 10s - loss: 0.3444 - acc: 0.8645 - auc_roc: 0.79 - ETA: 9s - loss: 0.3438 -
acc: 0.8647 - auc_roc: 0.7948 - ETA: 8s - loss: 0.3446 - acc: 0.8646 - auc_roc:
0.794 - ETA: 8s - loss: 0.3445 - acc: 0.8646 - auc_roc: 0.794 - ETA: 7s - loss:
0.3442 - acc: 0.8648 - auc_roc: 0.794 - ETA: 6s - loss: 0.3445 - acc: 0.8646 -
auc_roc: 0.794 - ETA: 6s - loss: 0.3447 - acc: 0.8647 - auc_roc: 0.794 - ETA: 5s
- loss: 0.3449 - acc: 0.8648 - auc_roc: 0.793 - ETA: 4s - loss: 0.3449 - acc:
0.8648 - auc_roc: 0.793 - ETA: 4s - loss: 0.3451 - acc: 0.8647 - auc_roc: 0.793
- ETA: 3s - loss: 0.3454 - acc: 0.8645 - auc_roc: 0.793 - ETA: 2s - loss: 0.3449
- acc: 0.8648 - auc_roc: 0.793 - ETA: 2s - loss: 0.3449 - acc: 0.8649 - auc_roc:
0.792 - ETA: 1s - loss: 0.3451 - acc: 0.8646 - auc_roc: 0.792 - ETA: 0s - loss:
0.3455 - acc: 0.8646 - auc_roc: 0.792 - ETA: 0s - loss: 0.3459 - acc: 0.8645 -
auc_roc: 0.791 - 51s 729us/step - loss: 0.3459 - acc: 0.8644 - auc_roc: 0.7921 -
val_loss: 0.3790 - val_acc: 0.8429 - val_auc_roc: 0.7512

Epoch 00008: val_auc_roc did not improve from 0.75507
Epoch 9/50
69918/69918 [==============================] - ETA: 44s - loss: 0.3625 - acc:
0.8545 - auc_roc: 0.80 - ETA: 43s - loss: 0.3607 - acc: 0.8516 - auc_roc: 0.80 -
ETA: 43s - loss: 0.3526 - acc: 0.8584 - auc_roc: 0.80 - ETA: 43s - loss: 0.3534
- acc: 0.8589 - auc_roc: 0.80 - ETA: 42s - loss: 0.3454 - acc: 0.8627 - auc_roc:
0.81 - ETA: 42s - loss: 0.3448 - acc: 0.8646 - auc_roc: 0.81 - ETA: 41s - loss:
0.3431 - acc: 0.8668 - auc_roc: 0.80 - ETA: 40s - loss: 0.3428 - acc: 0.8661 -
```

```
auc_roc: 0.80 - ETA: 39s - loss: 0.3406 - acc: 0.8661 - auc_roc: 0.81 - ETA: 38s
- loss: 0.3455 - acc: 0.8644 - auc_roc: 0.80 - ETA: 38s - loss: 0.3437 - acc:
0.8654 - auc_roc: 0.80 - ETA: 37s - loss: 0.3439 - acc: 0.8649 - auc_roc: 0.80 -
ETA: 37s - loss: 0.3453 - acc: 0.8646 - auc_roc: 0.80 - ETA: 36s - loss: 0.3449
- acc: 0.8650 - auc_roc: 0.80 - ETA: 35s - loss: 0.3428 - acc: 0.8661 - auc_roc:
0.80 - ETA: 35s - loss: 0.3432 - acc: 0.8655 - auc_roc: 0.80 - ETA: 34s - loss:
0.3435 - acc: 0.8652 - auc_roc: 0.80 - ETA: 33s - loss: 0.3424 - acc: 0.8653 -
auc_roc: 0.80 - ETA: 33s - loss: 0.3403 - acc: 0.8665 - auc_roc: 0.80 - ETA: 32s
- loss: 0.3412 - acc: 0.8659 - auc_roc: 0.80 - ETA: 31s - loss: 0.3417 - acc:
0.8657 - auc_roc: 0.80 - ETA: 30s - loss: 0.3400 - acc: 0.8666 - auc_roc: 0.80 -
ETA: 30s - loss: 0.3400 - acc: 0.8669 - auc_roc: 0.80 - ETA: 29s - loss: 0.3398
- acc: 0.8666 - auc_roc: 0.80 - ETA: 28s - loss: 0.3406 - acc: 0.8662 - auc_roc:
0.80 - ETA: 28s - loss: 0.3412 - acc: 0.8659 - auc_roc: 0.80 - ETA: 27s - loss:
0.3410 - acc: 0.8663 - auc_roc: 0.80 - ETA: 26s - loss: 0.3405 - acc: 0.8665 -
auc_roc: 0.80 - ETA: 26s - loss: 0.3395 - acc: 0.8676 - auc_roc: 0.80 - ETA: 25s
- loss: 0.3401 - acc: 0.8672 - auc_roc: 0.80 - ETA: 24s - loss: 0.3426 - acc:
0.8659 - auc_roc: 0.80 - ETA: 24s - loss: 0.3427 - acc: 0.8659 - auc_roc: 0.80 -
ETA: 23s - loss: 0.3425 - acc: 0.8664 - auc_roc: 0.80 - ETA: 22s - loss: 0.3424
- acc: 0.8667 - auc_roc: 0.80 - ETA: 22s - loss: 0.3427 - acc: 0.8665 - auc_roc:
0.80 - ETA: 21s - loss: 0.3422 - acc: 0.8669 - auc_roc: 0.80 - ETA: 20s - loss:
0.3429 - acc: 0.8665 - auc_roc: 0.80 - ETA: 20s - loss: 0.3431 - acc: 0.8662 -
auc_roc: 0.80 - ETA: 19s - loss: 0.3425 - acc: 0.8662 - auc_roc: 0.80 - ETA: 18s
- loss: 0.3426 - acc: 0.8660 - auc_roc: 0.80 - ETA: 18s - loss: 0.3427 - acc:
0.8658 - auc_roc: 0.80 - ETA: 17s - loss: 0.3428 - acc: 0.8659 - auc_roc: 0.80 -
ETA: 16s - loss: 0.3434 - acc: 0.8656 - auc_roc: 0.80 - ETA: 16s - loss: 0.3434
- acc: 0.8656 - auc_roc: 0.80 - ETA: 15s - loss: 0.3430 - acc: 0.8658 - auc_roc:
0.79 - ETA: 14s - loss: 0.3431 - acc: 0.8657 - auc_roc: 0.79 - ETA: 14s - loss:
0.3434 - acc: 0.8654 - auc_roc: 0.79 - ETA: 13s - loss: 0.3430 - acc: 0.8657 -
auc_roc: 0.79 - ETA: 12s - loss: 0.3425 - acc: 0.8659 - auc_roc: 0.79 - ETA: 12s
- loss: 0.3417 - acc: 0.8665 - auc_roc: 0.79 - ETA: 11s - loss: 0.3413 - acc:
0.8668 - auc_roc: 0.79 - ETA: 10s - loss: 0.3410 - acc: 0.8668 - auc_roc: 0.79 -
ETA: 10s - loss: 0.3417 - acc: 0.8668 - auc_roc: 0.79 - ETA: 9s - loss: 0.3416 -
acc: 0.8669 - auc_roc: 0.7990 - ETA: 8s - loss: 0.3414 - acc: 0.8669 - auc_roc:
0.799 - ETA: 8s - loss: 0.3416 - acc: 0.8666 - auc_roc: 0.799 - ETA: 7s - loss:
0.3417 - acc: 0.8667 - auc_roc: 0.798 - ETA: 6s - loss: 0.3420 - acc: 0.8664 -
auc_roc: 0.797 - ETA: 6s - loss: 0.3410 - acc: 0.8669 - auc_roc: 0.798 - ETA: 5s
- loss: 0.3416 - acc: 0.8666 - auc_roc: 0.798 - ETA: 4s - loss: 0.3418 - acc:
0.8664 - auc_roc: 0.798 - ETA: 4s - loss: 0.3415 - acc: 0.8666 - auc_roc: 0.798
- ETA: 3s - loss: 0.3416 - acc: 0.8666 - auc_roc: 0.798 - ETA: 2s - loss: 0.3413
- acc: 0.8667 - auc_roc: 0.798 - ETA: 2s - loss: 0.3413 - acc: 0.8668 - auc_roc:
0.799 - ETA: 1s - loss: 0.3412 - acc: 0.8668 - auc_roc: 0.799 - ETA: 0s - loss:
0.3409 - acc: 0.8670 - auc_roc: 0.798 - ETA: 0s - loss: 0.3401 - acc: 0.8672 -
auc_roc: 0.799 - 51s 730us/step - loss: 0.3401 - acc: 0.8672 - auc_roc: 0.7998 -
val_loss: 0.3765 - val_acc: 0.8511 - val_auc_roc: 0.7527

Epoch 00009: val_auc_roc did not improve from 0.75507
Epoch 10/50
69918/69918 [==============================] - ETA: 44s - loss: 0.2822 - acc:
```

0.8887 - auc_roc: 0.85 - ETA: 42s - loss: 0.3091 - acc: 0.8730 - auc_roc: 0.84 - ETA: 42s - loss: 0.3127 - acc: 0.8737 - auc_roc: 0.84 - ETA: 42s - loss: 0.3195 - acc: 0.8713 - auc_roc: 0.82 - ETA: 41s - loss: 0.3178 - acc: 0.8738 - auc_roc: 0.82 - ETA: 41s - loss: 0.3215 - acc: 0.8734 - auc_roc: 0.81 - ETA: 40s - loss: 0.3266 - acc: 0.8707 - auc_roc: 0.81 - ETA: 40s - loss: 0.3298 - acc: 0.8696 - auc_roc: 0.81 - ETA: 39s - loss: 0.3286 - acc: 0.8700 - auc_roc: 0.81 - ETA: 38s - loss: 0.3288 - acc: 0.8714 - auc_roc: 0.80 - ETA: 38s - loss: 0.3276 - acc: 0.8713 - auc_roc: 0.81 - ETA: 37s - loss: 0.3297 - acc: 0.8709 - auc_roc: 0.81 - ETA: 37s - loss: 0.3298 - acc: 0.8709 - auc_roc: 0.80 - ETA: 36s - loss: 0.3301 - acc: 0.8707 - auc_roc: 0.81 - ETA: 35s - loss: 0.3262 - acc: 0.8720 - auc_roc: 0.81 - ETA: 35s - loss: 0.3260 - acc: 0.8724 - auc_roc: 0.81 - ETA: 34s - loss: 0.3277 - acc: 0.8718 - auc_roc: 0.81 - ETA: 33s - loss: 0.3277 - acc: 0.8724 - auc_roc: 0.81 - ETA: 33s - loss: 0.3266 - acc: 0.8729 - auc_roc: 0.81 - ETA: 32s - loss: 0.3264 - acc: 0.8728 - auc_roc: 0.81 - ETA: 31s - loss: 0.3276 - acc: 0.8727 - auc_roc: 0.81 - ETA: 31s - loss: 0.3284 - acc: 0.8721 - auc_roc: 0.81 - ETA: 30s - loss: 0.3285 - acc: 0.8721 - auc_roc: 0.81 - ETA: 29s - loss: 0.3292 - acc: 0.8720 - auc_roc: 0.81 - ETA: 29s - loss: 0.3295 - acc: 0.8714 - auc_roc: 0.81 - ETA: 28s - loss: 0.3296 - acc: 0.8713 - auc_roc: 0.81 - ETA: 27s - loss: 0.3304 - acc: 0.8708 - auc_roc: 0.81 - ETA: 27s - loss: 0.3311 - acc: 0.8705 - auc_roc: 0.81 - ETA: 26s - loss: 0.3315 - acc: 0.8708 - auc_roc: 0.80 - ETA: 25s - loss: 0.3321 - acc: 0.8706 - auc_roc: 0.81 - ETA: 25s - loss: 0.3323 - acc: 0.8702 - auc_roc: 0.81 - ETA: 24s - loss: 0.3330 - acc: 0.8698 - auc_roc: 0.81 - ETA: 23s - loss: 0.3338 - acc: 0.8695 - auc_roc: 0.81 - ETA: 23s - loss: 0.3341 - acc: 0.8696 - auc_roc: 0.80 - ETA: 22s - loss: 0.3331 - acc: 0.8698 - auc_roc: 0.81 - ETA: 21s - loss: 0.3340 - acc: 0.8694 - auc_roc: 0.80 - ETA: 20s - loss: 0.3340 - acc: 0.8693 - auc_roc: 0.81 - ETA: 20s - loss: 0.3335 - acc: 0.8699 - auc_roc: 0.81 - ETA: 19s - loss: 0.3336 - acc: 0.8701 - auc_roc: 0.81 - ETA: 18s - loss: 0.3337 - acc: 0.8700 - auc_roc: 0.81 - ETA: 18s - loss: 0.3349 - acc: 0.8694 - auc_roc: 0.80 - ETA: 17s - loss: 0.3349 - acc: 0.8694 - auc_roc: 0.80 - ETA: 16s - loss: 0.3350 - acc: 0.8694 - auc_roc: 0.80 - ETA: 16s - loss: 0.3350 - acc: 0.8694 - auc_roc: 0.80 - ETA: 15s - loss: 0.3348 - acc: 0.8696 - auc_roc: 0.80 - ETA: 14s - loss: 0.3343 - acc: 0.8701 - auc_roc: 0.80 - ETA: 14s - loss: 0.3343 - acc: 0.8701 - auc_roc: 0.80 - ETA: 13s - loss: 0.3344 - acc: 0.8701 - auc_roc: 0.80 - ETA: 12s - loss: 0.3348 - acc: 0.8696 - auc_roc: 0.80 - ETA: 12s - loss: 0.3349 - acc: 0.8696 - auc_roc: 0.80 - ETA: 11s - loss: 0.3346 - acc: 0.8699 - auc_roc: 0.80 - ETA: 10s - loss: 0.3349 - acc: 0.8698 - auc_roc: 0.80 - ETA: 10s - loss: 0.3348 - acc: 0.8697 - auc_roc: 0.80 - ETA: 9s - loss: 0.3346 - acc: 0.8698 - auc_roc: 0.8073 - ETA: 8s - loss: 0.3345 - acc: 0.8699 - auc_roc: 0.807 - ETA: 8s - loss: 0.3344 - acc: 0.8701 - auc_roc: 0.807 - ETA: 7s - loss: 0.3342 - acc: 0.8701 - auc_roc: 0.807 - ETA: 6s - loss: 0.3345 - acc: 0.8699 - auc_roc: 0.807 - ETA: 6s - loss: 0.3343 - acc: 0.8700 - auc_roc: 0.807 - ETA: 5s - loss: 0.3345 - acc: 0.8698 - auc_roc: 0.807 - ETA: 4s - loss: 0.3344 - acc: 0.8699 - auc_roc: 0.807 - ETA: 4s - loss: 0.3346 - acc: 0.8698 - auc_roc: 0.807 - ETA: 3s - loss: 0.3349 - acc: 0.8697 - auc_roc: 0.807 - ETA: 2s - loss: 0.3352 - acc: 0.8696 - auc_roc: 0.807 - ETA: 2s - loss: 0.3348 - acc: 0.8699 - auc_roc: 0.807 - ETA: 1s - loss: 0.3345 - acc: 0.8700 - auc_roc: 0.807 - ETA: 0s - loss: 0.3342 - acc: 0.8703 - auc_roc: 0.807 - ETA: 0s - loss: 0.3343 - acc: 0.8702 - auc_roc: 0.807 - 51s 734us/step - loss: 0.3340 - acc: 0.8704 - auc_roc: 0.8073 -

```
val_loss: 0.3838 - val_acc: 0.8522 - val_auc_roc: 0.7462

Epoch 00010: val_auc_roc did not improve from 0.75507
Epoch 11/50
69918/69918 [==============================] - ETA: 46s - loss: 0.3875 - acc:
0.8506 - auc_roc: 0.80 - ETA: 44s - loss: 0.3622 - acc: 0.8608 - auc_roc: 0.81 -
ETA: 43s - loss: 0.3593 - acc: 0.8607 - auc_roc: 0.80 - ETA: 42s - loss: 0.3472
- acc: 0.8687 - auc_roc: 0.80 - ETA: 41s - loss: 0.3413 - acc: 0.8713 - auc_roc:
0.81 - ETA: 40s - loss: 0.3403 - acc: 0.8713 - auc_roc: 0.80 - ETA: 40s - loss:
0.3381 - acc: 0.8717 - auc_roc: 0.80 - ETA: 39s - loss: 0.3395 - acc: 0.8706 -
auc_roc: 0.81 - ETA: 39s - loss: 0.3376 - acc: 0.8711 - auc_roc: 0.81 - ETA: 38s
- loss: 0.3352 - acc: 0.8724 - auc_roc: 0.81 - ETA: 37s - loss: 0.3342 - acc:
0.8722 - auc_roc: 0.81 - ETA: 37s - loss: 0.3343 - acc: 0.8721 - auc_roc: 0.81 -
ETA: 36s - loss: 0.3353 - acc: 0.8717 - auc_roc: 0.81 - ETA: 36s - loss: 0.3354
- acc: 0.8716 - auc_roc: 0.81 - ETA: 35s - loss: 0.3343 - acc: 0.8722 - auc_roc:
0.81 - ETA: 34s - loss: 0.3319 - acc: 0.8730 - auc_roc: 0.81 - ETA: 34s - loss:
0.3315 - acc: 0.8736 - auc_roc: 0.81 - ETA: 33s - loss: 0.3316 - acc: 0.8738 -
auc_roc: 0.81 - ETA: 32s - loss: 0.3305 - acc: 0.8742 - auc_roc: 0.81 - ETA: 32s
- loss: 0.3311 - acc: 0.8735 - auc_roc: 0.81 - ETA: 31s - loss: 0.3311 - acc:
0.8734 - auc_roc: 0.81 - ETA: 30s - loss: 0.3306 - acc: 0.8737 - auc_roc: 0.81 -
ETA: 30s - loss: 0.3303 - acc: 0.8734 - auc_roc: 0.81 - ETA: 29s - loss: 0.3296
- acc: 0.8737 - auc_roc: 0.81 - ETA: 28s - loss: 0.3282 - acc: 0.8744 - auc_roc:
0.81 - ETA: 28s - loss: 0.3288 - acc: 0.8742 - auc_roc: 0.81 - ETA: 27s - loss:
0.3292 - acc: 0.8743 - auc_roc: 0.81 - ETA: 26s - loss: 0.3289 - acc: 0.8744 -
auc_roc: 0.81 - ETA: 26s - loss: 0.3284 - acc: 0.8743 - auc_roc: 0.81 - ETA: 25s
- loss: 0.3288 - acc: 0.8740 - auc_roc: 0.81 - ETA: 24s - loss: 0.3282 - acc:
0.8741 - auc_roc: 0.81 - ETA: 24s - loss: 0.3283 - acc: 0.8739 - auc_roc: 0.81 -
ETA: 23s - loss: 0.3272 - acc: 0.8742 - auc_roc: 0.81 - ETA: 22s - loss: 0.3269
- acc: 0.8744 - auc_roc: 0.81 - ETA: 22s - loss: 0.3261 - acc: 0.8747 - auc_roc:
0.81 - ETA: 21s - loss: 0.3255 - acc: 0.8751 - auc_roc: 0.81 - ETA: 20s - loss:
0.3250 - acc: 0.8754 - auc_roc: 0.81 - ETA: 20s - loss: 0.3251 - acc: 0.8752 -
auc_roc: 0.81 - ETA: 19s - loss: 0.3252 - acc: 0.8750 - auc_roc: 0.81 - ETA: 18s
- loss: 0.3253 - acc: 0.8747 - auc_roc: 0.81 - ETA: 18s - loss: 0.3253 - acc:
0.8748 - auc_roc: 0.81 - ETA: 17s - loss: 0.3256 - acc: 0.8748 - auc_roc: 0.81 -
ETA: 16s - loss: 0.3256 - acc: 0.8747 - auc_roc: 0.81 - ETA: 16s - loss: 0.3258
- acc: 0.8745 - auc_roc: 0.81 - ETA: 15s - loss: 0.3258 - acc: 0.8746 - auc_roc:
0.81 - ETA: 14s - loss: 0.3255 - acc: 0.8747 - auc_roc: 0.81 - ETA: 14s - loss:
0.3252 - acc: 0.8749 - auc_roc: 0.81 - ETA: 13s - loss: 0.3246 - acc: 0.8750 -
auc_roc: 0.82 - ETA: 12s - loss: 0.3259 - acc: 0.8744 - auc_roc: 0.81 - ETA: 12s
- loss: 0.3255 - acc: 0.8746 - auc_roc: 0.81 - ETA: 11s - loss: 0.3253 - acc:
0.8745 - auc_roc: 0.81 - ETA: 10s - loss: 0.3255 - acc: 0.8744 - auc_roc: 0.81 -
ETA: 10s - loss: 0.3250 - acc: 0.8747 - auc_roc: 0.81 - ETA: 9s - loss: 0.3249 -
acc: 0.8749 - auc_roc: 0.8192 - ETA: 8s - loss: 0.3242 - acc: 0.8750 - auc_roc:
0.819 - ETA: 8s - loss: 0.3246 - acc: 0.8749 - auc_roc: 0.819 - ETA: 7s - loss:
0.3247 - acc: 0.8749 - auc_roc: 0.819 - ETA: 6s - loss: 0.3249 - acc: 0.8747 -
auc_roc: 0.819 - ETA: 6s - loss: 0.3256 - acc: 0.8743 - auc_roc: 0.818 - ETA: 5s
- loss: 0.3254 - acc: 0.8745 - auc_roc: 0.818 - ETA: 4s - loss: 0.3257 - acc:
0.8744 - auc_roc: 0.818 - ETA: 4s - loss: 0.3260 - acc: 0.8740 - auc_roc: 0.818
```

```
- ETA: 3s - loss: 0.3262 - acc: 0.8739 - auc_roc: 0.818 - ETA: 2s - loss: 0.3268
- acc: 0.8736 - auc_roc: 0.818 - ETA: 2s - loss: 0.3269 - acc: 0.8735 - auc_roc:
0.817 - ETA: 1s - loss: 0.3270 - acc: 0.8734 - auc_roc: 0.818 - ETA: 0s - loss:
0.3268 - acc: 0.8735 - auc_roc: 0.818 - ETA: 0s - loss: 0.3268 - acc: 0.8734 -
auc_roc: 0.818 - 51s 729us/step - loss: 0.3268 - acc: 0.8734 - auc_roc: 0.8184 -
val_loss: 0.3929 - val_acc: 0.8504 - val_auc_roc: 0.7398

Epoch 00011: val_auc_roc did not improve from 0.75507
Epoch 12/50
69918/69918 [==============================] - ETA: 45s - loss: 0.3324 - acc:
0.8701 - auc_roc: 0.82 - ETA: 44s - loss: 0.3326 - acc: 0.8711 - auc_roc: 0.82 -
ETA: 43s - loss: 0.3300 - acc: 0.8747 - auc_roc: 0.82 - ETA: 42s - loss: 0.3305
- acc: 0.8726 - auc_roc: 0.81 - ETA: 41s - loss: 0.3341 - acc: 0.8717 - auc_roc:
0.81 - ETA: 40s - loss: 0.3288 - acc: 0.8755 - auc_roc: 0.81 - ETA: 40s - loss:
0.3263 - acc: 0.8771 - auc_roc: 0.82 - ETA: 39s - loss: 0.3233 - acc: 0.8774 -
auc_roc: 0.82 - ETA: 39s - loss: 0.3198 - acc: 0.8788 - auc_roc: 0.82 - ETA: 38s
- loss: 0.3211 - acc: 0.8791 - auc_roc: 0.82 - ETA: 38s - loss: 0.3224 - acc:
0.8781 - auc_roc: 0.82 - ETA: 37s - loss: 0.3207 - acc: 0.8781 - auc_roc: 0.82 -
ETA: 36s - loss: 0.3212 - acc: 0.8783 - auc_roc: 0.82 - ETA: 36s - loss: 0.3206
- acc: 0.8788 - auc_roc: 0.82 - ETA: 35s - loss: 0.3203 - acc: 0.8794 - auc_roc:
0.82 - ETA: 34s - loss: 0.3208 - acc: 0.8785 - auc_roc: 0.82 - ETA: 34s - loss:
0.3196 - acc: 0.8790 - auc_roc: 0.82 - ETA: 33s - loss: 0.3192 - acc: 0.8790 -
auc_roc: 0.82 - ETA: 32s - loss: 0.3195 - acc: 0.8786 - auc_roc: 0.82 - ETA: 32s
- loss: 0.3199 - acc: 0.8783 - auc_roc: 0.82 - ETA: 31s - loss: 0.3187 - acc:
0.8785 - auc_roc: 0.82 - ETA: 30s - loss: 0.3190 - acc: 0.8778 - auc_roc: 0.82 -
ETA: 30s - loss: 0.3191 - acc: 0.8778 - auc_roc: 0.82 - ETA: 29s - loss: 0.3193
- acc: 0.8777 - auc_roc: 0.82 - ETA: 28s - loss: 0.3187 - acc: 0.8780 - auc_roc:
0.82 - ETA: 28s - loss: 0.3176 - acc: 0.8781 - auc_roc: 0.82 - ETA: 27s - loss:
0.3171 - acc: 0.8786 - auc_roc: 0.82 - ETA: 26s - loss: 0.3185 - acc: 0.8784 -
auc_roc: 0.82 - ETA: 26s - loss: 0.3182 - acc: 0.8784 - auc_roc: 0.82 - ETA: 25s
- loss: 0.3194 - acc: 0.8780 - auc_roc: 0.82 - ETA: 24s - loss: 0.3195 - acc:
0.8779 - auc_roc: 0.82 - ETA: 24s - loss: 0.3199 - acc: 0.8779 - auc_roc: 0.82 -
ETA: 23s - loss: 0.3207 - acc: 0.8774 - auc_roc: 0.82 - ETA: 22s - loss: 0.3200
- acc: 0.8780 - auc_roc: 0.82 - ETA: 22s - loss: 0.3199 - acc: 0.8778 - auc_roc:
0.82 - ETA: 21s - loss: 0.3192 - acc: 0.8780 - auc_roc: 0.82 - ETA: 20s - loss:
0.3185 - acc: 0.8782 - auc_roc: 0.82 - ETA: 20s - loss: 0.3197 - acc: 0.8780 -
auc_roc: 0.82 - ETA: 19s - loss: 0.3210 - acc: 0.8773 - auc_roc: 0.82 - ETA: 18s
- loss: 0.3210 - acc: 0.8772 - auc_roc: 0.82 - ETA: 18s - loss: 0.3216 - acc:
0.8767 - auc_roc: 0.82 - ETA: 17s - loss: 0.3214 - acc: 0.8772 - auc_roc: 0.82 -
ETA: 16s - loss: 0.3212 - acc: 0.8772 - auc_roc: 0.82 - ETA: 16s - loss: 0.3211
- acc: 0.8773 - auc_roc: 0.82 - ETA: 15s - loss: 0.3217 - acc: 0.8769 - auc_roc:
0.82 - ETA: 14s - loss: 0.3215 - acc: 0.8770 - auc_roc: 0.82 - ETA: 14s - loss:
0.3213 - acc: 0.8768 - auc_roc: 0.82 - ETA: 13s - loss: 0.3206 - acc: 0.8772 -
auc_roc: 0.82 - ETA: 12s - loss: 0.3207 - acc: 0.8774 - auc_roc: 0.82 - ETA: 12s
- loss: 0.3200 - acc: 0.8778 - auc_roc: 0.82 - ETA: 11s - loss: 0.3196 - acc:
0.8781 - auc_roc: 0.82 - ETA: 10s - loss: 0.3199 - acc: 0.8781 - auc_roc: 0.82 -
ETA: 10s - loss: 0.3201 - acc: 0.8779 - auc_roc: 0.82 - ETA: 9s - loss: 0.3201 -
acc: 0.8778 - auc_roc: 0.8267 - ETA: 8s - loss: 0.3198 - acc: 0.8779 - auc_roc:
```

```
0.827 - ETA: 8s - loss: 0.3202 - acc: 0.8777 - auc_roc: 0.826 - ETA: 7s - loss:
0.3204 - acc: 0.8774 - auc_roc: 0.827 - ETA: 6s - loss: 0.3200 - acc: 0.8776 -
auc_roc: 0.827 - ETA: 6s - loss: 0.3200 - acc: 0.8776 - auc_roc: 0.826 - ETA: 5s
- loss: 0.3205 - acc: 0.8774 - auc_roc: 0.826 - ETA: 4s - loss: 0.3204 - acc:
0.8775 - auc_roc: 0.826 - ETA: 4s - loss: 0.3198 - acc: 0.8779 - auc_roc: 0.827
- ETA: 3s - loss: 0.3204 - acc: 0.8776 - auc_roc: 0.826 - ETA: 2s - loss: 0.3200
- acc: 0.8777 - auc_roc: 0.826 - ETA: 2s - loss: 0.3201 - acc: 0.8774 - auc_roc:
0.827 - ETA: 1s - loss: 0.3199 - acc: 0.8776 - auc_roc: 0.827 - ETA: 0s - loss:
0.3195 - acc: 0.8777 - auc_roc: 0.827 - ETA: 0s - loss: 0.3194 - acc: 0.8777 -
auc_roc: 0.827 - 51s 730us/step - loss: 0.3194 - acc: 0.8777 - auc_roc: 0.8276 -
val_loss: 0.3925 - val_acc: 0.8441 - val_auc_roc: 0.7397

Epoch 00012: val_auc_roc did not improve from 0.75507
Epoch 13/50
69918/69918 [==============================] - ETA: 49s - loss: 0.3224 - acc:
0.8740 - auc_roc: 0.83 - ETA: 46s - loss: 0.3156 - acc: 0.8799 - auc_roc: 0.83 -
ETA: 45s - loss: 0.3120 - acc: 0.8825 - auc_roc: 0.83 - ETA: 44s - loss: 0.3060
- acc: 0.8850 - auc_roc: 0.83 - ETA: 43s - loss: 0.3076 - acc: 0.8836 - auc_roc:
0.83 - ETA: 42s - loss: 0.3072 - acc: 0.8835 - auc_roc: 0.83 - ETA: 41s - loss:
0.3054 - acc: 0.8836 - auc_roc: 0.84 - ETA: 40s - loss: 0.3084 - acc: 0.8828 -
auc_roc: 0.83 - ETA: 39s - loss: 0.3109 - acc: 0.8814 - auc_roc: 0.83 - ETA: 38s
- loss: 0.3084 - acc: 0.8820 - auc_roc: 0.84 - ETA: 38s - loss: 0.3073 - acc:
0.8824 - auc_roc: 0.84 - ETA: 37s - loss: 0.3062 - acc: 0.8826 - auc_roc: 0.84 -
ETA: 36s - loss: 0.3077 - acc: 0.8818 - auc_roc: 0.84 - ETA: 36s - loss: 0.3060
- acc: 0.8820 - auc_roc: 0.84 - ETA: 35s - loss: 0.3041 - acc: 0.8831 - auc_roc:
0.84 - ETA: 34s - loss: 0.3055 - acc: 0.8826 - auc_roc: 0.84 - ETA: 34s - loss:
0.3042 - acc: 0.8833 - auc_roc: 0.84 - ETA: 33s - loss: 0.3049 - acc: 0.8829 -
auc_roc: 0.84 - ETA: 32s - loss: 0.3053 - acc: 0.8830 - auc_roc: 0.84 - ETA: 32s
- loss: 0.3047 - acc: 0.8833 - auc_roc: 0.84 - ETA: 31s - loss: 0.3050 - acc:
0.8830 - auc_roc: 0.84 - ETA: 30s - loss: 0.3059 - acc: 0.8824 - auc_roc: 0.84 -
ETA: 30s - loss: 0.3058 - acc: 0.8821 - auc_roc: 0.84 - ETA: 29s - loss: 0.3064
- acc: 0.8816 - auc_roc: 0.84 - ETA: 28s - loss: 0.3043 - acc: 0.8825 - auc_roc:
0.84 - ETA: 28s - loss: 0.3061 - acc: 0.8816 - auc_roc: 0.84 - ETA: 27s - loss:
0.3049 - acc: 0.8821 - auc_roc: 0.84 - ETA: 26s - loss: 0.3049 - acc: 0.8820 -
auc_roc: 0.84 - ETA: 26s - loss: 0.3059 - acc: 0.8819 - auc_roc: 0.84 - ETA: 25s
- loss: 0.3056 - acc: 0.8822 - auc_roc: 0.84 - ETA: 24s - loss: 0.3058 - acc:
0.8820 - auc_roc: 0.84 - ETA: 24s - loss: 0.3059 - acc: 0.8821 - auc_roc: 0.84 -
ETA: 23s - loss: 0.3063 - acc: 0.8819 - auc_roc: 0.84 - ETA: 22s - loss: 0.3063
- acc: 0.8819 - auc_roc: 0.84 - ETA: 22s - loss: 0.3064 - acc: 0.8818 - auc_roc:
0.84 - ETA: 21s - loss: 0.3072 - acc: 0.8815 - auc_roc: 0.84 - ETA: 20s - loss:
0.3071 - acc: 0.8817 - auc_roc: 0.84 - ETA: 20s - loss: 0.3071 - acc: 0.8817 -
auc_roc: 0.84 - ETA: 19s - loss: 0.3069 - acc: 0.8818 - auc_roc: 0.84 - ETA: 18s
- loss: 0.3069 - acc: 0.8818 - auc_roc: 0.84 - ETA: 18s - loss: 0.3072 - acc:
0.8817 - auc_roc: 0.84 - ETA: 17s - loss: 0.3070 - acc: 0.8818 - auc_roc: 0.84 -
ETA: 16s - loss: 0.3076 - acc: 0.8816 - auc_roc: 0.84 - ETA: 16s - loss: 0.3078
- acc: 0.8817 - auc_roc: 0.84 - ETA: 15s - loss: 0.3077 - acc: 0.8819 - auc_roc:
0.83 - ETA: 14s - loss: 0.3078 - acc: 0.8817 - auc_roc: 0.84 - ETA: 14s - loss:
0.3087 - acc: 0.8812 - auc_roc: 0.83 - ETA: 13s - loss: 0.3089 - acc: 0.8811 -
```

```
auc_roc: 0.83 - ETA: 12s - loss: 0.3092 - acc: 0.8810 - auc_roc: 0.83 - ETA: 12s
- loss: 0.3093 - acc: 0.8810 - auc_roc: 0.83 - ETA: 11s - loss: 0.3090 - acc:
0.8812 - auc_roc: 0.83 - ETA: 10s - loss: 0.3091 - acc: 0.8811 - auc_roc: 0.83 -
ETA: 10s - loss: 0.3092 - acc: 0.8810 - auc_roc: 0.83 - ETA: 9s - loss: 0.3101 -
acc: 0.8807 - auc_roc: 0.8382 - ETA: 8s - loss: 0.3101 - acc: 0.8808 - auc_roc:
0.837 - ETA: 8s - loss: 0.3106 - acc: 0.8806 - auc_roc: 0.836 - ETA: 7s - loss:
0.3108 - acc: 0.8805 - auc_roc: 0.836 - ETA: 6s - loss: 0.3109 - acc: 0.8804 -
auc_roc: 0.836 - ETA: 6s - loss: 0.3108 - acc: 0.8804 - auc_roc: 0.836 - ETA: 5s
- loss: 0.3106 - acc: 0.8805 - auc_roc: 0.836 - ETA: 4s - loss: 0.3103 - acc:
0.8808 - auc_roc: 0.836 - ETA: 4s - loss: 0.3105 - acc: 0.8806 - auc_roc: 0.836
- ETA: 3s - loss: 0.3113 - acc: 0.8803 - auc_roc: 0.836 - ETA: 2s - loss: 0.3111
- acc: 0.8802 - auc_roc: 0.835 - ETA: 2s - loss: 0.3110 - acc: 0.8803 - auc_roc:
0.835 - ETA: 1s - loss: 0.3110 - acc: 0.8804 - auc_roc: 0.835 - ETA: 0s - loss:
0.3113 - acc: 0.8801 - auc_roc: 0.835 - ETA: 0s - loss: 0.3113 - acc: 0.8802 -
auc_roc: 0.835 - 51s 730us/step - loss: 0.3115 - acc: 0.8800 - auc_roc: 0.8358 -
val_loss: 0.3977 - val_acc: 0.8423 - val_auc_roc: 0.7316

Epoch 00013: val_auc_roc did not improve from 0.75507
Epoch 14/50
69918/69918 [==============================] - ETA: 44s - loss: 0.2853 - acc:
0.8984 - auc_roc: 0.88 - ETA: 43s - loss: 0.2962 - acc: 0.8936 - auc_roc: 0.86 -
ETA: 42s - loss: 0.3054 - acc: 0.8857 - auc_roc: 0.85 - ETA: 42s - loss: 0.3018
- acc: 0.8857 - auc_roc: 0.85 - ETA: 41s - loss: 0.3050 - acc: 0.8852 - auc_roc:
0.85 - ETA: 41s - loss: 0.3011 - acc: 0.8864 - auc_roc: 0.86 - ETA: 40s - loss:
0.3028 - acc: 0.8860 - auc_roc: 0.85 - ETA: 40s - loss: 0.3005 - acc: 0.8872 -
auc_roc: 0.85 - ETA: 39s - loss: 0.2978 - acc: 0.8890 - auc_roc: 0.85 - ETA: 38s
- loss: 0.2958 - acc: 0.8910 - auc_roc: 0.85 - ETA: 38s - loss: 0.2989 - acc:
0.8892 - auc_roc: 0.85 - ETA: 37s - loss: 0.2993 - acc: 0.8892 - auc_roc: 0.85 -
ETA: 36s - loss: 0.2974 - acc: 0.8895 - auc_roc: 0.85 - ETA: 36s - loss: 0.2960
- acc: 0.8901 - auc_roc: 0.85 - ETA: 35s - loss: 0.2967 - acc: 0.8898 - auc_roc:
0.85 - ETA: 34s - loss: 0.2950 - acc: 0.8904 - auc_roc: 0.85 - ETA: 34s - loss:
0.2944 - acc: 0.8908 - auc_roc: 0.85 - ETA: 33s - loss: 0.2961 - acc: 0.8901 -
auc_roc: 0.85 - ETA: 32s - loss: 0.2967 - acc: 0.8899 - auc_roc: 0.85 - ETA: 32s
- loss: 0.2972 - acc: 0.8891 - auc_roc: 0.85 - ETA: 31s - loss: 0.2981 - acc:
0.8883 - auc_roc: 0.85 - ETA: 30s - loss: 0.2974 - acc: 0.8888 - auc_roc: 0.85 -
ETA: 30s - loss: 0.2974 - acc: 0.8887 - auc_roc: 0.85 - ETA: 29s - loss: 0.2990
- acc: 0.8881 - auc_roc: 0.85 - ETA: 28s - loss: 0.2987 - acc: 0.8883 - auc_roc:
0.85 - ETA: 28s - loss: 0.2973 - acc: 0.8891 - auc_roc: 0.85 - ETA: 27s - loss:
0.2970 - acc: 0.8893 - auc_roc: 0.85 - ETA: 26s - loss: 0.2973 - acc: 0.8890 -
auc_roc: 0.85 - ETA: 26s - loss: 0.2981 - acc: 0.8884 - auc_roc: 0.85 - ETA: 25s
- loss: 0.2978 - acc: 0.8886 - auc_roc: 0.85 - ETA: 24s - loss: 0.2980 - acc:
0.8884 - auc_roc: 0.85 - ETA: 24s - loss: 0.2975 - acc: 0.8883 - auc_roc: 0.85 -
ETA: 23s - loss: 0.2971 - acc: 0.8885 - auc_roc: 0.85 - ETA: 22s - loss: 0.2970
- acc: 0.8883 - auc_roc: 0.85 - ETA: 22s - loss: 0.2976 - acc: 0.8879 - auc_roc:
0.85 - ETA: 21s - loss: 0.2975 - acc: 0.8882 - auc_roc: 0.85 - ETA: 20s - loss:
0.2981 - acc: 0.8879 - auc_roc: 0.85 - ETA: 20s - loss: 0.2984 - acc: 0.8879 -
auc_roc: 0.84 - ETA: 19s - loss: 0.2989 - acc: 0.8875 - auc_roc: 0.84 - ETA: 18s
- loss: 0.2982 - acc: 0.8877 - auc_roc: 0.85 - ETA: 18s - loss: 0.2983 - acc:
```

```
0.8877 - auc_roc: 0.84 - ETA: 17s - loss: 0.2988 - acc: 0.8875 - auc_roc: 0.84 -
ETA: 16s - loss: 0.2995 - acc: 0.8872 - auc_roc: 0.84 - ETA: 16s - loss: 0.3000
- acc: 0.8870 - auc_roc: 0.84 - ETA: 15s - loss: 0.2998 - acc: 0.8870 - auc_roc:
0.84 - ETA: 14s - loss: 0.3004 - acc: 0.8868 - auc_roc: 0.84 - ETA: 14s - loss:
0.3000 - acc: 0.8869 - auc_roc: 0.84 - ETA: 13s - loss: 0.3001 - acc: 0.8869 -
auc_roc: 0.84 - ETA: 12s - loss: 0.3011 - acc: 0.8865 - auc_roc: 0.84 - ETA: 12s
- loss: 0.3005 - acc: 0.8868 - auc_roc: 0.84 - ETA: 11s - loss: 0.3001 - acc:
0.8868 - auc_roc: 0.84 - ETA: 10s - loss: 0.3000 - acc: 0.8867 - auc_roc: 0.84 -
ETA: 10s - loss: 0.3002 - acc: 0.8867 - auc_roc: 0.84 - ETA: 9s - loss: 0.2998 -
acc: 0.8870 - auc_roc: 0.8484 - ETA: 8s - loss: 0.2997 - acc: 0.8870 - auc_roc:
0.848 - ETA: 8s - loss: 0.2996 - acc: 0.8871 - auc_roc: 0.848 - ETA: 7s - loss:
0.2992 - acc: 0.8873 - auc_roc: 0.848 - ETA: 6s - loss: 0.3000 - acc: 0.8870 -
auc_roc: 0.848 - ETA: 6s - loss: 0.3003 - acc: 0.8869 - auc_roc: 0.848 - ETA: 5s
- loss: 0.3004 - acc: 0.8868 - auc_roc: 0.847 - ETA: 4s - loss: 0.3009 - acc:
0.8865 - auc_roc: 0.847 - ETA: 4s - loss: 0.3009 - acc: 0.8865 - auc_roc: 0.847
- ETA: 3s - loss: 0.3014 - acc: 0.8863 - auc_roc: 0.846 - ETA: 2s - loss: 0.3018
- acc: 0.8861 - auc_roc: 0.846 - ETA: 2s - loss: 0.3019 - acc: 0.8860 - auc_roc:
0.846 - ETA: 1s - loss: 0.3021 - acc: 0.8858 - auc_roc: 0.846 - ETA: 0s - loss:
0.3019 - acc: 0.8859 - auc_roc: 0.846 - ETA: 0s - loss: 0.3017 - acc: 0.8859 -
auc_roc: 0.847 - 51s 730us/step - loss: 0.3016 - acc: 0.8860 - auc_roc: 0.8471 -
val_loss: 0.4203 - val_acc: 0.8482 - val_auc_roc: 0.7260

Epoch 00014: val_auc_roc did not improve from 0.75507
Epoch 15/50
69918/69918 [==============================] - ETA: 44s - loss: 0.2812 - acc:
0.8887 - auc_roc: 0.87 - ETA: 43s - loss: 0.2919 - acc: 0.8906 - auc_roc: 0.86 -
ETA: 43s - loss: 0.2923 - acc: 0.8896 - auc_roc: 0.85 - ETA: 43s - loss: 0.3042
- acc: 0.8843 - auc_roc: 0.85 - ETA: 42s - loss: 0.2913 - acc: 0.8910 - auc_roc:
0.86 - ETA: 42s - loss: 0.2910 - acc: 0.8901 - auc_roc: 0.86 - ETA: 41s - loss:
0.2932 - acc: 0.8876 - auc_roc: 0.86 - ETA: 40s - loss: 0.2953 - acc: 0.8871 -
auc_roc: 0.86 - ETA: 39s - loss: 0.2908 - acc: 0.8893 - auc_roc: 0.86 - ETA: 39s
- loss: 0.2909 - acc: 0.8899 - auc_roc: 0.86 - ETA: 38s - loss: 0.2916 - acc:
0.8890 - auc_roc: 0.86 - ETA: 38s - loss: 0.2896 - acc: 0.8905 - auc_roc: 0.86 -
ETA: 37s - loss: 0.2888 - acc: 0.8911 - auc_roc: 0.86 - ETA: 36s - loss: 0.2890
- acc: 0.8908 - auc_roc: 0.86 - ETA: 36s - loss: 0.2894 - acc: 0.8904 - auc_roc:
0.86 - ETA: 35s - loss: 0.2897 - acc: 0.8906 - auc_roc: 0.85 - ETA: 34s - loss:
0.2892 - acc: 0.8912 - auc_roc: 0.85 - ETA: 33s - loss: 0.2886 - acc: 0.8912 -
auc_roc: 0.86 - ETA: 33s - loss: 0.2888 - acc: 0.8911 - auc_roc: 0.86 - ETA: 32s
- loss: 0.2877 - acc: 0.8921 - auc_roc: 0.86 - ETA: 31s - loss: 0.2879 - acc:
0.8917 - auc_roc: 0.86 - ETA: 30s - loss: 0.2880 - acc: 0.8918 - auc_roc: 0.86 -
ETA: 30s - loss: 0.2872 - acc: 0.8922 - auc_roc: 0.86 - ETA: 29s - loss: 0.2862
- acc: 0.8929 - auc_roc: 0.86 - ETA: 28s - loss: 0.2848 - acc: 0.8934 - auc_roc:
0.86 - ETA: 28s - loss: 0.2863 - acc: 0.8929 - auc_roc: 0.86 - ETA: 27s - loss:
0.2864 - acc: 0.8929 - auc_roc: 0.86 - ETA: 26s - loss: 0.2873 - acc: 0.8925 -
auc_roc: 0.85 - ETA: 26s - loss: 0.2867 - acc: 0.8927 - auc_roc: 0.86 - ETA: 25s
- loss: 0.2873 - acc: 0.8924 - auc_roc: 0.86 - ETA: 24s - loss: 0.2872 - acc:
0.8924 - auc_roc: 0.86 - ETA: 24s - loss: 0.2861 - acc: 0.8928 - auc_roc: 0.86 -
ETA: 23s - loss: 0.2873 - acc: 0.8923 - auc_roc: 0.86 - ETA: 22s - loss: 0.2875
```

- acc: 0.8920 - auc_roc: 0.86 - ETA: 22s - loss: 0.2878 - acc: 0.8921 - auc_roc:
0.85 - ETA: 21s - loss: 0.2883 - acc: 0.8920 - auc_roc: 0.85 - ETA: 20s - loss:
0.2892 - acc: 0.8915 - auc_roc: 0.85 - ETA: 20s - loss: 0.2896 - acc: 0.8917 -
auc_roc: 0.85 - ETA: 19s - loss: 0.2898 - acc: 0.8917 - auc_roc: 0.85 - ETA: 18s
- loss: 0.2893 - acc: 0.8919 - auc_roc: 0.85 - ETA: 18s - loss: 0.2897 - acc:
0.8916 - auc_roc: 0.85 - ETA: 17s - loss: 0.2898 - acc: 0.8915 - auc_roc: 0.85 -
ETA: 16s - loss: 0.2895 - acc: 0.8916 - auc_roc: 0.85 - ETA: 16s - loss: 0.2900
- acc: 0.8916 - auc_roc: 0.85 - ETA: 15s - loss: 0.2902 - acc: 0.8916 - auc_roc:
0.85 - ETA: 14s - loss: 0.2907 - acc: 0.8913 - auc_roc: 0.85 - ETA: 14s - loss:
0.2911 - acc: 0.8910 - auc_roc: 0.85 - ETA: 13s - loss: 0.2904 - acc: 0.8912 -
auc_roc: 0.85 - ETA: 12s - loss: 0.2908 - acc: 0.8910 - auc_roc: 0.85 - ETA: 12s
- loss: 0.2907 - acc: 0.8911 - auc_roc: 0.85 - ETA: 11s - loss: 0.2912 - acc:
0.8908 - auc_roc: 0.85 - ETA: 10s - loss: 0.2915 - acc: 0.8907 - auc_roc: 0.85 -
ETA: 10s - loss: 0.2911 - acc: 0.8909 - auc_roc: 0.85 - ETA: 9s - loss: 0.2906 -
acc: 0.8911 - auc_roc: 0.8587 - ETA: 8s - loss: 0.2913 - acc: 0.8910 - auc_roc:
0.857 - ETA: 8s - loss: 0.2917 - acc: 0.8909 - auc_roc: 0.857 - ETA: 7s - loss:
0.2920 - acc: 0.8908 - auc_roc: 0.856 - ETA: 6s - loss: 0.2917 - acc: 0.8908 -
auc_roc: 0.856 - ETA: 6s - loss: 0.2917 - acc: 0.8908 - auc_roc: 0.856 - ETA: 5s
- loss: 0.2919 - acc: 0.8906 - auc_roc: 0.856 - ETA: 4s - loss: 0.2922 - acc:
0.8904 - auc_roc: 0.856 - ETA: 4s - loss: 0.2922 - acc: 0.8904 - auc_roc: 0.856
- ETA: 3s - loss: 0.2922 - acc: 0.8905 - auc_roc: 0.856 - ETA: 2s - loss: 0.2921
- acc: 0.8905 - auc_roc: 0.856 - ETA: 2s - loss: 0.2926 - acc: 0.8903 - auc_roc:
0.855 - ETA: 1s - loss: 0.2925 - acc: 0.8903 - auc_roc: 0.855 - ETA: 0s - loss:
0.2932 - acc: 0.8900 - auc_roc: 0.855 - ETA: 0s - loss: 0.2933 - acc: 0.8899 -
auc_roc: 0.855 - 51s 730us/step - loss: 0.2932 - acc: 0.8899 - auc_roc: 0.8551 -
val_loss: 0.4064 - val_acc: 0.8461 - val_auc_roc: 0.7123

Epoch 00015: val_auc_roc did not improve from 0.75507
Epoch 16/50
69918/69918 [==============================] - ETA: 46s - loss: 0.2520 - acc:
0.9062 - auc_roc: 0.89 - ETA: 44s - loss: 0.2838 - acc: 0.8872 - auc_roc: 0.87 -
ETA: 43s - loss: 0.2829 - acc: 0.8916 - auc_roc: 0.86 - ETA: 42s - loss: 0.2847
- acc: 0.8931 - auc_roc: 0.86 - ETA: 42s - loss: 0.2857 - acc: 0.8920 - auc_roc:
0.86 - ETA: 41s - loss: 0.2859 - acc: 0.8929 - auc_roc: 0.86 - ETA: 40s - loss:
0.2809 - acc: 0.8940 - auc_roc: 0.87 - ETA: 40s - loss: 0.2786 - acc: 0.8954 -
auc_roc: 0.87 - ETA: 39s - loss: 0.2772 - acc: 0.8953 - auc_roc: 0.87 - ETA: 38s
- loss: 0.2753 - acc: 0.8965 - auc_roc: 0.87 - ETA: 37s - loss: 0.2754 - acc:
0.8955 - auc_roc: 0.87 - ETA: 37s - loss: 0.2730 - acc: 0.8971 - auc_roc: 0.87 -
ETA: 36s - loss: 0.2740 - acc: 0.8960 - auc_roc: 0.87 - ETA: 35s - loss: 0.2768
- acc: 0.8954 - auc_roc: 0.87 - ETA: 35s - loss: 0.2766 - acc: 0.8959 - auc_roc:
0.87 - ETA: 34s - loss: 0.2756 - acc: 0.8965 - auc_roc: 0.87 - ETA: 33s - loss:
0.2752 - acc: 0.8967 - auc_roc: 0.87 - ETA: 33s - loss: 0.2743 - acc: 0.8969 -
auc_roc: 0.87 - ETA: 32s - loss: 0.2747 - acc: 0.8964 - auc_roc: 0.87 - ETA: 31s
- loss: 0.2743 - acc: 0.8969 - auc_roc: 0.87 - ETA: 31s - loss: 0.2727 - acc:
0.8975 - auc_roc: 0.87 - ETA: 30s - loss: 0.2736 - acc: 0.8969 - auc_roc: 0.87 -
ETA: 29s - loss: 0.2731 - acc: 0.8970 - auc_roc: 0.87 - ETA: 29s - loss: 0.2728
- acc: 0.8971 - auc_roc: 0.87 - ETA: 28s - loss: 0.2726 - acc: 0.8975 - auc_roc:
0.87 - ETA: 27s - loss: 0.2724 - acc: 0.8977 - auc_roc: 0.87 - ETA: 27s - loss:

```
0.2725 - acc: 0.8977 - auc_roc: 0.87 - ETA: 26s - loss: 0.2728 - acc: 0.8975 -
auc_roc: 0.87 - ETA: 26s - loss: 0.2729 - acc: 0.8975 - auc_roc: 0.87 - ETA: 25s
- loss: 0.2732 - acc: 0.8976 - auc_roc: 0.87 - ETA: 24s - loss: 0.2741 - acc:
0.8973 - auc_roc: 0.87 - ETA: 24s - loss: 0.2739 - acc: 0.8976 - auc_roc: 0.87 -
ETA: 23s - loss: 0.2743 - acc: 0.8975 - auc_roc: 0.87 - ETA: 22s - loss: 0.2736
- acc: 0.8975 - auc_roc: 0.87 - ETA: 22s - loss: 0.2739 - acc: 0.8972 - auc_roc:
0.87 - ETA: 21s - loss: 0.2739 - acc: 0.8971 - auc_roc: 0.87 - ETA: 20s - loss:
0.2747 - acc: 0.8965 - auc_roc: 0.87 - ETA: 20s - loss: 0.2762 - acc: 0.8960 -
auc_roc: 0.87 - ETA: 19s - loss: 0.2766 - acc: 0.8957 - auc_roc: 0.87 - ETA: 18s
- loss: 0.2778 - acc: 0.8952 - auc_roc: 0.86 - ETA: 18s - loss: 0.2779 - acc:
0.8952 - auc_roc: 0.87 - ETA: 17s - loss: 0.2779 - acc: 0.8953 - auc_roc: 0.86 -
ETA: 16s - loss: 0.2780 - acc: 0.8953 - auc_roc: 0.86 - ETA: 16s - loss: 0.2784
- acc: 0.8951 - auc_roc: 0.86 - ETA: 15s - loss: 0.2790 - acc: 0.8948 - auc_roc:
0.86 - ETA: 14s - loss: 0.2792 - acc: 0.8947 - auc_roc: 0.86 - ETA: 14s - loss:
0.2792 - acc: 0.8946 - auc_roc: 0.86 - ETA: 13s - loss: 0.2791 - acc: 0.8947 -
auc_roc: 0.86 - ETA: 12s - loss: 0.2792 - acc: 0.8945 - auc_roc: 0.86 - ETA: 12s
- loss: 0.2790 - acc: 0.8947 - auc_roc: 0.86 - ETA: 11s - loss: 0.2787 - acc:
0.8947 - auc_roc: 0.86 - ETA: 10s - loss: 0.2787 - acc: 0.8946 - auc_roc: 0.86 -
ETA: 10s - loss: 0.2785 - acc: 0.8947 - auc_roc: 0.86 - ETA: 9s - loss: 0.2791 -
acc: 0.8944 - auc_roc: 0.8690 - ETA: 8s - loss: 0.2794 - acc: 0.8943 - auc_roc:
0.868 - ETA: 8s - loss: 0.2797 - acc: 0.8942 - auc_roc: 0.868 - ETA: 7s - loss:
0.2802 - acc: 0.8939 - auc_roc: 0.868 - ETA: 6s - loss: 0.2806 - acc: 0.8939 -
auc_roc: 0.868 - ETA: 6s - loss: 0.2806 - acc: 0.8939 - auc_roc: 0.868 - ETA: 5s
- loss: 0.2807 - acc: 0.8938 - auc_roc: 0.868 - ETA: 4s - loss: 0.2810 - acc:
0.8937 - auc_roc: 0.867 - ETA: 4s - loss: 0.2807 - acc: 0.8938 - auc_roc: 0.868
- ETA: 3s - loss: 0.2814 - acc: 0.8936 - auc_roc: 0.867 - ETA: 2s - loss: 0.2813
- acc: 0.8936 - auc_roc: 0.867 - ETA: 2s - loss: 0.2815 - acc: 0.8934 - auc_roc:
0.867 - ETA: 1s - loss: 0.2814 - acc: 0.8936 - auc_roc: 0.867 - ETA: 0s - loss:
0.2820 - acc: 0.8933 - auc_roc: 0.866 - ETA: 0s - loss: 0.2820 - acc: 0.8933 -
auc_roc: 0.866 - 51s 725us/step - loss: 0.2820 - acc: 0.8934 - auc_roc: 0.8667 -
val_loss: 0.4288 - val_acc: 0.8391 - val_auc_roc: 0.7066

Epoch 00016: val_auc_roc did not improve from 0.75507
Epoch 17/50
69918/69918 [==============================] - ETA: 46s - loss: 0.2919 - acc:
0.8818 - auc_roc: 0.87 - ETA: 45s - loss: 0.2859 - acc: 0.8892 - auc_roc: 0.87 -
ETA: 43s - loss: 0.2848 - acc: 0.8910 - auc_roc: 0.87 - ETA: 42s - loss: 0.2744
- acc: 0.8960 - auc_roc: 0.87 - ETA: 42s - loss: 0.2666 - acc: 0.9002 - auc_roc:
0.88 - ETA: 41s - loss: 0.2706 - acc: 0.8979 - auc_roc: 0.88 - ETA: 40s - loss:
0.2693 - acc: 0.8986 - auc_roc: 0.88 - ETA: 39s - loss: 0.2725 - acc: 0.8975 -
auc_roc: 0.87 - ETA: 39s - loss: 0.2728 - acc: 0.8976 - auc_roc: 0.87 - ETA: 38s
- loss: 0.2716 - acc: 0.8981 - auc_roc: 0.87 - ETA: 37s - loss: 0.2700 - acc:
0.8983 - auc_roc: 0.87 - ETA: 36s - loss: 0.2699 - acc: 0.8980 - auc_roc: 0.88 -
ETA: 36s - loss: 0.2708 - acc: 0.8976 - auc_roc: 0.88 - ETA: 35s - loss: 0.2690
- acc: 0.8987 - auc_roc: 0.88 - ETA: 35s - loss: 0.2697 - acc: 0.8989 - auc_roc:
0.88 - ETA: 34s - loss: 0.2691 - acc: 0.8994 - auc_roc: 0.88 - ETA: 33s - loss:
0.2691 - acc: 0.8991 - auc_roc: 0.88 - ETA: 33s - loss: 0.2709 - acc: 0.8987 -
auc_roc: 0.88 - ETA: 32s - loss: 0.2709 - acc: 0.8990 - auc_roc: 0.88 - ETA: 31s
```

- loss: 0.2705 - acc: 0.8994 - auc_roc: 0.88 - ETA: 31s - loss: 0.2684 - acc:
0.9003 - auc_roc: 0.88 - ETA: 30s - loss: 0.2675 - acc: 0.9006 - auc_roc: 0.88 -
ETA: 29s - loss: 0.2676 - acc: 0.9005 - auc_roc: 0.88 - ETA: 29s - loss: 0.2657
- acc: 0.9015 - auc_roc: 0.88 - ETA: 28s - loss: 0.2662 - acc: 0.9012 - auc_roc:
0.88 - ETA: 27s - loss: 0.2663 - acc: 0.9012 - auc_roc: 0.88 - ETA: 27s - loss:
0.2657 - acc: 0.9015 - auc_roc: 0.88 - ETA: 26s - loss: 0.2646 - acc: 0.9018 -
auc_roc: 0.88 - ETA: 25s - loss: 0.2648 - acc: 0.9016 - auc_roc: 0.88 - ETA: 25s
- loss: 0.2658 - acc: 0.9014 - auc_roc: 0.88 - ETA: 24s - loss: 0.2658 - acc:
0.9015 - auc_roc: 0.88 - ETA: 23s - loss: 0.2656 - acc: 0.9015 - auc_roc: 0.88 -
ETA: 23s - loss: 0.2652 - acc: 0.9015 - auc_roc: 0.88 - ETA: 22s - loss: 0.2661
- acc: 0.9012 - auc_roc: 0.88 - ETA: 21s - loss: 0.2668 - acc: 0.9011 - auc_roc:
0.88 - ETA: 21s - loss: 0.2665 - acc: 0.9012 - auc_roc: 0.88 - ETA: 20s - loss:
0.2662 - acc: 0.9012 - auc_roc: 0.88 - ETA: 19s - loss: 0.2664 - acc: 0.9012 -
auc_roc: 0.88 - ETA: 19s - loss: 0.2662 - acc: 0.9013 - auc_roc: 0.88 - ETA: 18s
- loss: 0.2668 - acc: 0.9010 - auc_roc: 0.87 - ETA: 18s - loss: 0.2676 - acc:
0.9007 - auc_roc: 0.87 - ETA: 17s - loss: 0.2677 - acc: 0.9005 - auc_roc: 0.87 -
ETA: 16s - loss: 0.2683 - acc: 0.9003 - auc_roc: 0.87 - ETA: 16s - loss: 0.2684
- acc: 0.9003 - auc_roc: 0.87 - ETA: 15s - loss: 0.2689 - acc: 0.8999 - auc_roc:
0.87 - ETA: 14s - loss: 0.2690 - acc: 0.8997 - auc_roc: 0.87 - ETA: 14s - loss:
0.2690 - acc: 0.8998 - auc_roc: 0.87 - ETA: 13s - loss: 0.2685 - acc: 0.9001 -
auc_roc: 0.87 - ETA: 12s - loss: 0.2686 - acc: 0.9000 - auc_roc: 0.87 - ETA: 12s
- loss: 0.2690 - acc: 0.8997 - auc_roc: 0.87 - ETA: 11s - loss: 0.2695 - acc:
0.8994 - auc_roc: 0.87 - ETA: 10s - loss: 0.2691 - acc: 0.8995 - auc_roc: 0.87 -
ETA: 10s - loss: 0.2688 - acc: 0.8997 - auc_roc: 0.87 - ETA: 9s - loss: 0.2690 -
acc: 0.8997 - auc_roc: 0.8784 - ETA: 8s - loss: 0.2692 - acc: 0.8997 - auc_roc:
0.878 - ETA: 8s - loss: 0.2693 - acc: 0.8998 - auc_roc: 0.878 - ETA: 7s - loss:
0.2695 - acc: 0.8997 - auc_roc: 0.877 - ETA: 6s - loss: 0.2697 - acc: 0.8996 -
auc_roc: 0.877 - ETA: 6s - loss: 0.2702 - acc: 0.8993 - auc_roc: 0.877 - ETA: 5s
- loss: 0.2704 - acc: 0.8992 - auc_roc: 0.876 - ETA: 4s - loss: 0.2702 - acc:
0.8991 - auc_roc: 0.876 - ETA: 4s - loss: 0.2704 - acc: 0.8989 - auc_roc: 0.876
- ETA: 3s - loss: 0.2708 - acc: 0.8987 - auc_roc: 0.876 - ETA: 2s - loss: 0.2713
- acc: 0.8985 - auc_roc: 0.876 - ETA: 2s - loss: 0.2715 - acc: 0.8983 - auc_roc:
0.876 - ETA: 1s - loss: 0.2715 - acc: 0.8984 - auc_roc: 0.876 - ETA: 0s - loss:
0.2714 - acc: 0.8985 - auc_roc: 0.876 - ETA: 0s - loss: 0.2711 - acc: 0.8986 -
auc_roc: 0.876 - 51s 726us/step - loss: 0.2710 - acc: 0.8987 - auc_roc: 0.8763 -
val_loss: 0.4438 - val_acc: 0.8425 - val_auc_roc: 0.7069

Epoch 00017: val_auc_roc did not improve from 0.75507
Epoch 18/50
69918/69918 [==============================] - ETA: 44s - loss: 0.2260 - acc:
0.9121 - auc_roc: 0.91 - ETA: 43s - loss: 0.2367 - acc: 0.9106 - auc_roc: 0.90 -
ETA: 42s - loss: 0.2426 - acc: 0.9089 - auc_roc: 0.89 - ETA: 41s - loss: 0.2465
- acc: 0.9070 - auc_roc: 0.89 - ETA: 41s - loss: 0.2469 - acc: 0.9068 - auc_roc:
0.89 - ETA: 40s - loss: 0.2474 - acc: 0.9069 - auc_roc: 0.89 - ETA: 39s - loss:
0.2453 - acc: 0.9075 - auc_roc: 0.90 - ETA: 39s - loss: 0.2463 - acc: 0.9075 -
auc_roc: 0.89 - ETA: 38s - loss: 0.2474 - acc: 0.9072 - auc_roc: 0.89 - ETA: 37s
- loss: 0.2481 - acc: 0.9071 - auc_roc: 0.89 - ETA: 36s - loss: 0.2512 - acc:
0.9050 - auc_roc: 0.89 - ETA: 36s - loss: 0.2519 - acc: 0.9047 - auc_roc: 0.89 -

```
ETA: 35s - loss: 0.2508 - acc: 0.9055 - auc_roc: 0.89 - ETA: 35s - loss: 0.2485
- acc: 0.9062 - auc_roc: 0.89 - ETA: 34s - loss: 0.2480 - acc: 0.9067 - auc_roc:
0.89 - ETA: 34s - loss: 0.2487 - acc: 0.9067 - auc_roc: 0.89 - ETA: 33s - loss:
0.2498 - acc: 0.9062 - auc_roc: 0.89 - ETA: 32s - loss: 0.2527 - acc: 0.9049 -
auc_roc: 0.89 - ETA: 32s - loss: 0.2541 - acc: 0.9048 - auc_roc: 0.89 - ETA: 31s
- loss: 0.2544 - acc: 0.9049 - auc_roc: 0.89 - ETA: 31s - loss: 0.2536 - acc:
0.9056 - auc_roc: 0.89 - ETA: 30s - loss: 0.2535 - acc: 0.9055 - auc_roc: 0.89 -
ETA: 29s - loss: 0.2525 - acc: 0.9060 - auc_roc: 0.89 - ETA: 29s - loss: 0.2538
- acc: 0.9053 - auc_roc: 0.89 - ETA: 28s - loss: 0.2534 - acc: 0.9053 - auc_roc:
0.89 - ETA: 27s - loss: 0.2555 - acc: 0.9046 - auc_roc: 0.89 - ETA: 27s - loss:
0.2557 - acc: 0.9042 - auc_roc: 0.89 - ETA: 26s - loss: 0.2560 - acc: 0.9041 -
auc_roc: 0.89 - ETA: 25s - loss: 0.2557 - acc: 0.9042 - auc_roc: 0.89 - ETA: 25s
- loss: 0.2576 - acc: 0.9032 - auc_roc: 0.88 - ETA: 24s - loss: 0.2575 - acc:
0.9034 - auc_roc: 0.88 - ETA: 23s - loss: 0.2585 - acc: 0.9030 - auc_roc: 0.88 -
ETA: 23s - loss: 0.2590 - acc: 0.9029 - auc_roc: 0.88 - ETA: 22s - loss: 0.2589
- acc: 0.9031 - auc_roc: 0.88 - ETA: 21s - loss: 0.2586 - acc: 0.9033 - auc_roc:
0.88 - ETA: 21s - loss: 0.2582 - acc: 0.9037 - auc_roc: 0.88 - ETA: 20s - loss:
0.2573 - acc: 0.9040 - auc_roc: 0.88 - ETA: 19s - loss: 0.2574 - acc: 0.9040 -
auc_roc: 0.88 - ETA: 19s - loss: 0.2570 - acc: 0.9042 - auc_roc: 0.89 - ETA: 18s
- loss: 0.2580 - acc: 0.9036 - auc_roc: 0.88 - ETA: 17s - loss: 0.2582 - acc:
0.9035 - auc_roc: 0.88 - ETA: 17s - loss: 0.2585 - acc: 0.9034 - auc_roc: 0.88 -
ETA: 16s - loss: 0.2580 - acc: 0.9035 - auc_roc: 0.88 - ETA: 16s - loss: 0.2583
- acc: 0.9032 - auc_roc: 0.88 - ETA: 15s - loss: 0.2581 - acc: 0.9033 - auc_roc:
0.88 - ETA: 14s - loss: 0.2576 - acc: 0.9036 - auc_roc: 0.88 - ETA: 14s - loss:
0.2575 - acc: 0.9038 - auc_roc: 0.88 - ETA: 13s - loss: 0.2584 - acc: 0.9032 -
auc_roc: 0.88 - ETA: 12s - loss: 0.2585 - acc: 0.9030 - auc_roc: 0.88 - ETA: 12s
- loss: 0.2588 - acc: 0.9029 - auc_roc: 0.88 - ETA: 11s - loss: 0.2583 - acc:
0.9031 - auc_roc: 0.88 - ETA: 10s - loss: 0.2592 - acc: 0.9028 - auc_roc: 0.88 -
ETA: 10s - loss: 0.2591 - acc: 0.9029 - auc_roc: 0.88 - ETA: 9s - loss: 0.2590 -
acc: 0.9030 - auc_roc: 0.8882 - ETA: 8s - loss: 0.2593 - acc: 0.9028 - auc_roc:
0.887 - ETA: 8s - loss: 0.2589 - acc: 0.9031 - auc_roc: 0.887 - ETA: 7s - loss:
0.2588 - acc: 0.9033 - auc_roc: 0.887 - ETA: 6s - loss: 0.2594 - acc: 0.9031 -
auc_roc: 0.887 - ETA: 6s - loss: 0.2595 - acc: 0.9030 - auc_roc: 0.887 - ETA: 5s
- loss: 0.2596 - acc: 0.9030 - auc_roc: 0.887 - ETA: 4s - loss: 0.2596 - acc:
0.9030 - auc_roc: 0.887 - ETA: 4s - loss: 0.2593 - acc: 0.9031 - auc_roc: 0.887
- ETA: 3s - loss: 0.2589 - acc: 0.9034 - auc_roc: 0.887 - ETA: 2s - loss: 0.2586
- acc: 0.9036 - auc_roc: 0.887 - ETA: 2s - loss: 0.2589 - acc: 0.9035 - auc_roc:
0.887 - ETA: 1s - loss: 0.2594 - acc: 0.9033 - auc_roc: 0.886 - ETA: 0s - loss:
0.2595 - acc: 0.9033 - auc_roc: 0.886 - ETA: 0s - loss: 0.2600 - acc: 0.9031 -
auc_roc: 0.886 - 51s 723us/step - loss: 0.2600 - acc: 0.9031 - auc_roc: 0.8865 -
val_loss: 0.4581 - val_acc: 0.8364 - val_auc_roc: 0.6833

Epoch 00018: val_auc_roc did not improve from 0.75507
Epoch 19/50
69918/69918 [==============================] - ETA: 44s - loss: 0.2460 - acc:
0.9141 - auc_roc: 0.91 - ETA: 43s - loss: 0.2307 - acc: 0.9199 - auc_roc: 0.91 -
ETA: 43s - loss: 0.2327 - acc: 0.9180 - auc_roc: 0.91 - ETA: 42s - loss: 0.2353
- acc: 0.9148 - auc_roc: 0.90 - ETA: 42s - loss: 0.2340 - acc: 0.9156 - auc_roc:
```

0.90 - ETA: 41s - loss: 0.2348 - acc: 0.9162 - auc_roc: 0.90 - ETA: 40s - loss: 0.2380 - acc: 0.9150 - auc_roc: 0.90 - ETA: 40s - loss: 0.2378 - acc: 0.9144 - auc_roc: 0.90 - ETA: 39s - loss: 0.2385 - acc: 0.9137 - auc_roc: 0.90 - ETA: 39s - loss: 0.2372 - acc: 0.9150 - auc_roc: 0.90 - ETA: 38s - loss: 0.2353 - acc: 0.9159 - auc_roc: 0.90 - ETA: 37s - loss: 0.2390 - acc: 0.9141 - auc_roc: 0.90 - ETA: 36s - loss: 0.2398 - acc: 0.9135 - auc_roc: 0.90 - ETA: 36s - loss: 0.2377 - acc: 0.9144 - auc_roc: 0.90 - ETA: 35s - loss: 0.2372 - acc: 0.9148 - auc_roc: 0.90 - ETA: 34s - loss: 0.2372 - acc: 0.9147 - auc_roc: 0.90 - ETA: 34s - loss: 0.2358 - acc: 0.9151 - auc_roc: 0.90 - ETA: 33s - loss: 0.2384 - acc: 0.9141 - auc_roc: 0.90 - ETA: 33s - loss: 0.2400 - acc: 0.9130 - auc_roc: 0.90 - ETA: 32s - loss: 0.2412 - acc: 0.9120 - auc_roc: 0.90 - ETA: 31s - loss: 0.2421 - acc: 0.9116 - auc_roc: 0.90 - ETA: 30s - loss: 0.2426 - acc: 0.9115 - auc_roc: 0.90 - ETA: 30s - loss: 0.2439 - acc: 0.9110 - auc_roc: 0.90 - ETA: 29s - loss: 0.2434 - acc: 0.9110 - auc_roc: 0.90 - ETA: 28s - loss: 0.2449 - acc: 0.9103 - auc_roc: 0.90 - ETA: 28s - loss: 0.2445 - acc: 0.9106 - auc_roc: 0.90 - ETA: 27s - loss: 0.2450 - acc: 0.9102 - auc_roc: 0.90 - ETA: 26s - loss: 0.2446 - acc: 0.9105 - auc_roc: 0.90 - ETA: 26s - loss: 0.2442 - acc: 0.9107 - auc_roc: 0.90 - ETA: 25s - loss: 0.2440 - acc: 0.9104 - auc_roc: 0.90 - ETA: 24s - loss: 0.2441 - acc: 0.9105 - auc_roc: 0.90 - ETA: 24s - loss: 0.2440 - acc: 0.9106 - auc_roc: 0.90 - ETA: 23s - loss: 0.2444 - acc: 0.9103 - auc_roc: 0.90 - ETA: 22s - loss: 0.2446 - acc: 0.9101 - auc_roc: 0.90 - ETA: 22s - loss: 0.2449 - acc: 0.9103 - auc_roc: 0.90 - ETA: 21s - loss: 0.2450 - acc: 0.9100 - auc_roc: 0.90 - ETA: 20s - loss: 0.2446 - acc: 0.9100 - auc_roc: 0.90 - ETA: 20s - loss: 0.2450 - acc: 0.9100 - auc_roc: 0.90 - ETA: 19s - loss: 0.2444 - acc: 0.9104 - auc_roc: 0.90 - ETA: 18s - loss: 0.2435 - acc: 0.9109 - auc_roc: 0.90 - ETA: 18s - loss: 0.2442 - acc: 0.9106 - auc_roc: 0.90 - ETA: 17s - loss: 0.2444 - acc: 0.9103 - auc_roc: 0.90 - ETA: 16s - loss: 0.2432 - acc: 0.9110 - auc_roc: 0.90 - ETA: 16s - loss: 0.2436 - acc: 0.9108 - auc_roc: 0.90 - ETA: 15s - loss: 0.2440 - acc: 0.9107 - auc_roc: 0.90 - ETA: 14s - loss: 0.2445 - acc: 0.9106 - auc_roc: 0.90 - ETA: 14s - loss: 0.2449 - acc: 0.9104 - auc_roc: 0.90 - ETA: 13s - loss: 0.2443 - acc: 0.9105 - auc_roc: 0.90 - ETA: 12s - loss: 0.2443 - acc: 0.9107 - auc_roc: 0.90 - ETA: 12s - loss: 0.2446 - acc: 0.9105 - auc_roc: 0.90 - ETA: 11s - loss: 0.2449 - acc: 0.9105 - auc_roc: 0.89 - ETA: 10s - loss: 0.2451 - acc: 0.9104 - auc_roc: 0.89 - ETA: 10s - loss: 0.2453 - acc: 0.9104 - auc_roc: 0.89 - ETA: 9s - loss: 0.2451 - acc: 0.9106 - auc_roc: 0.8990 - ETA: 8s - loss: 0.2449 - acc: 0.9105 - auc_roc: 0.899 - ETA: 8s - loss: 0.2447 - acc: 0.9106 - auc_roc: 0.899 - ETA: 7s - loss: 0.2447 - acc: 0.9105 - auc_roc: 0.899 - ETA: 6s - loss: 0.2448 - acc: 0.9104 - auc_roc: 0.899 - ETA: 6s - loss: 0.2446 - acc: 0.9104 - auc_roc: 0.899 - ETA: 5s - loss: 0.2447 - acc: 0.9104 - auc_roc: 0.899 - ETA: 4s - loss: 0.2448 - acc: 0.9103 - auc_roc: 0.899 - ETA: 4s - loss: 0.2454 - acc: 0.9100 - auc_roc: 0.899 - ETA: 3s - loss: 0.2457 - acc: 0.9097 - auc_roc: 0.898 - ETA: 2s - loss: 0.2459 - acc: 0.9097 - auc_roc: 0.898 - ETA: 2s - loss: 0.2462 - acc: 0.9095 - auc_roc: 0.897 - ETA: 1s - loss: 0.2461 - acc: 0.9095 - auc_roc: 0.897 - ETA: 0s - loss: 0.2463 - acc: 0.9092 - auc_roc: 0.897 - ETA: 0s - loss: 0.2466 - acc: 0.9092 - auc_roc: 0.897 - 51s 728us/step - loss: 0.2467 - acc: 0.9092 - auc_roc: 0.8971 - val_loss: 0.4965 - val_acc: 0.8378 - val_auc_roc: 0.6895

Epoch 00019: val_auc_roc did not improve from 0.75507

```
Epoch 20/50
69918/69918 [==============================] - ETA: 42s - loss: 0.2150 - acc:
0.9189 - auc_roc: 0.92 - ETA: 42s - loss: 0.2209 - acc: 0.9189 - auc_roc: 0.91 -
ETA: 42s - loss: 0.2227 - acc: 0.9206 - auc_roc: 0.91 - ETA: 42s - loss: 0.2243
- acc: 0.9192 - auc_roc: 0.91 - ETA: 41s - loss: 0.2236 - acc: 0.9199 - auc_roc:
0.91 - ETA: 40s - loss: 0.2257 - acc: 0.9186 - auc_roc: 0.91 - ETA: 40s - loss:
0.2280 - acc: 0.9176 - auc_roc: 0.91 - ETA: 39s - loss: 0.2236 - acc: 0.9189 -
auc_roc: 0.91 - ETA: 39s - loss: 0.2231 - acc: 0.9191 - auc_roc: 0.91 - ETA: 38s
- loss: 0.2237 - acc: 0.9187 - auc_roc: 0.91 - ETA: 37s - loss: 0.2221 - acc:
0.9196 - auc_roc: 0.91 - ETA: 37s - loss: 0.2218 - acc: 0.9189 - auc_roc: 0.91 -
ETA: 36s - loss: 0.2224 - acc: 0.9189 - auc_roc: 0.91 - ETA: 35s - loss: 0.2223
- acc: 0.9184 - auc_roc: 0.91 - ETA: 35s - loss: 0.2215 - acc: 0.9187 - auc_roc:
0.91 - ETA: 34s - loss: 0.2218 - acc: 0.9186 - auc_roc: 0.91 - ETA: 33s - loss:
0.2232 - acc: 0.9180 - auc_roc: 0.91 - ETA: 33s - loss: 0.2223 - acc: 0.9183 -
auc_roc: 0.91 - ETA: 32s - loss: 0.2215 - acc: 0.9187 - auc_roc: 0.91 - ETA: 32s
- loss: 0.2206 - acc: 0.9190 - auc_roc: 0.91 - ETA: 31s - loss: 0.2203 - acc:
0.9195 - auc_roc: 0.91 - ETA: 30s - loss: 0.2201 - acc: 0.9194 - auc_roc: 0.91 -
ETA: 30s - loss: 0.2205 - acc: 0.9193 - auc_roc: 0.91 - ETA: 29s - loss: 0.2211
- acc: 0.9190 - auc_roc: 0.91 - ETA: 28s - loss: 0.2220 - acc: 0.9184 - auc_roc:
0.91 - ETA: 28s - loss: 0.2228 - acc: 0.9180 - auc_roc: 0.91 - ETA: 27s - loss:
0.2234 - acc: 0.9177 - auc_roc: 0.91 - ETA: 26s - loss: 0.2242 - acc: 0.9175 -
auc_roc: 0.91 - ETA: 26s - loss: 0.2241 - acc: 0.9174 - auc_roc: 0.91 - ETA: 25s
- loss: 0.2237 - acc: 0.9177 - auc_roc: 0.91 - ETA: 24s - loss: 0.2244 - acc:
0.9176 - auc_roc: 0.91 - ETA: 23s - loss: 0.2246 - acc: 0.9174 - auc_roc: 0.91 -
ETA: 23s - loss: 0.2251 - acc: 0.9174 - auc_roc: 0.91 - ETA: 22s - loss: 0.2265
- acc: 0.9171 - auc_roc: 0.91 - ETA: 22s - loss: 0.2266 - acc: 0.9169 - auc_roc:
0.91 - ETA: 21s - loss: 0.2269 - acc: 0.9166 - auc_roc: 0.91 - ETA: 20s - loss:
0.2275 - acc: 0.9162 - auc_roc: 0.91 - ETA: 20s - loss: 0.2274 - acc: 0.9162 -
auc_roc: 0.91 - ETA: 19s - loss: 0.2279 - acc: 0.9158 - auc_roc: 0.91 - ETA: 18s
- loss: 0.2287 - acc: 0.9154 - auc_roc: 0.91 - ETA: 18s - loss: 0.2295 - acc:
0.9150 - auc_roc: 0.91 - ETA: 17s - loss: 0.2296 - acc: 0.9150 - auc_roc: 0.91 -
ETA: 16s - loss: 0.2298 - acc: 0.9149 - auc_roc: 0.91 - ETA: 16s - loss: 0.2297
- acc: 0.9147 - auc_roc: 0.91 - ETA: 15s - loss: 0.2304 - acc: 0.9144 - auc_roc:
0.91 - ETA: 14s - loss: 0.2303 - acc: 0.9144 - auc_roc: 0.91 - ETA: 14s - loss:
0.2304 - acc: 0.9144 - auc_roc: 0.91 - ETA: 13s - loss: 0.2309 - acc: 0.9144 -
auc_roc: 0.90 - ETA: 12s - loss: 0.2312 - acc: 0.9143 - auc_roc: 0.90 - ETA: 12s
- loss: 0.2317 - acc: 0.9142 - auc_roc: 0.90 - ETA: 11s - loss: 0.2313 - acc:
0.9144 - auc_roc: 0.90 - ETA: 10s - loss: 0.2317 - acc: 0.9142 - auc_roc: 0.90 -
ETA: 10s - loss: 0.2319 - acc: 0.9141 - auc_roc: 0.90 - ETA: 9s - loss: 0.2320 -
acc: 0.9143 - auc_roc: 0.9084 - ETA: 8s - loss: 0.2324 - acc: 0.9139 - auc_roc:
0.908 - ETA: 8s - loss: 0.2326 - acc: 0.9139 - auc_roc: 0.908 - ETA: 7s - loss:
0.2331 - acc: 0.9136 - auc_roc: 0.907 - ETA: 6s - loss: 0.2331 - acc: 0.9137 -
auc_roc: 0.907 - ETA: 6s - loss: 0.2337 - acc: 0.9135 - auc_roc: 0.907 - ETA: 5s
- loss: 0.2338 - acc: 0.9133 - auc_roc: 0.907 - ETA: 4s - loss: 0.2334 - acc:
0.9136 - auc_roc: 0.907 - ETA: 4s - loss: 0.2336 - acc: 0.9136 - auc_roc: 0.907
- ETA: 3s - loss: 0.2340 - acc: 0.9134 - auc_roc: 0.907 - ETA: 2s - loss: 0.2342
- acc: 0.9133 - auc_roc: 0.907 - ETA: 2s - loss: 0.2344 - acc: 0.9133 - auc_roc:
0.907 - ETA: 1s - loss: 0.2352 - acc: 0.9130 - auc_roc: 0.906 - ETA: 0s - loss:
```

```
0.2354 - acc: 0.9130 - auc_roc: 0.906 - ETA: 0s - loss: 0.2354 - acc: 0.9131 -
auc_roc: 0.906 - 51s 726us/step - loss: 0.2354 - acc: 0.9131 - auc_roc: 0.9065 -
val_loss: 0.4997 - val_acc: 0.8417 - val_auc_roc: 0.6791

Epoch 00020: val_auc_roc did not improve from 0.75507
Epoch 21/50
69918/69918 [==============================] - ETA: 48s - loss: 0.2414 - acc:
0.9043 - auc_roc: 0.90 - ETA: 44s - loss: 0.2252 - acc: 0.9160 - auc_roc: 0.91 -
ETA: 43s - loss: 0.2246 - acc: 0.9183 - auc_roc: 0.91 - ETA: 42s - loss: 0.2321
- acc: 0.9141 - auc_roc: 0.91 - ETA: 41s - loss: 0.2344 - acc: 0.9137 - auc_roc:
0.91 - ETA: 40s - loss: 0.2289 - acc: 0.9162 - auc_roc: 0.91 - ETA: 40s - loss:
0.2274 - acc: 0.9156 - auc_roc: 0.91 - ETA: 39s - loss: 0.2241 - acc: 0.9166 -
auc_roc: 0.91 - ETA: 38s - loss: 0.2235 - acc: 0.9168 - auc_roc: 0.91 - ETA: 38s
- loss: 0.2202 - acc: 0.9186 - auc_roc: 0.91 - ETA: 37s - loss: 0.2203 - acc:
0.9189 - auc_roc: 0.91 - ETA: 36s - loss: 0.2229 - acc: 0.9172 - auc_roc: 0.91 -
ETA: 36s - loss: 0.2217 - acc: 0.9186 - auc_roc: 0.91 - ETA: 35s - loss: 0.2197
- acc: 0.9196 - auc_roc: 0.91 - ETA: 35s - loss: 0.2198 - acc: 0.9193 - auc_roc:
0.92 - ETA: 34s - loss: 0.2184 - acc: 0.9199 - auc_roc: 0.92 - ETA: 33s - loss:
0.2202 - acc: 0.9191 - auc_roc: 0.91 - ETA: 33s - loss: 0.2208 - acc: 0.9189 -
auc_roc: 0.91 - ETA: 32s - loss: 0.2208 - acc: 0.9187 - auc_roc: 0.91 - ETA: 31s
- loss: 0.2203 - acc: 0.9187 - auc_roc: 0.91 - ETA: 31s - loss: 0.2208 - acc:
0.9187 - auc_roc: 0.91 - ETA: 30s - loss: 0.2212 - acc: 0.9187 - auc_roc: 0.91 -
ETA: 29s - loss: 0.2206 - acc: 0.9189 - auc_roc: 0.91 - ETA: 29s - loss: 0.2212
- acc: 0.9184 - auc_roc: 0.91 - ETA: 28s - loss: 0.2210 - acc: 0.9188 - auc_roc:
0.91 - ETA: 27s - loss: 0.2216 - acc: 0.9188 - auc_roc: 0.91 - ETA: 27s - loss:
0.2223 - acc: 0.9185 - auc_roc: 0.91 - ETA: 26s - loss: 0.2224 - acc: 0.9186 -
auc_roc: 0.91 - ETA: 25s - loss: 0.2227 - acc: 0.9186 - auc_roc: 0.91 - ETA: 25s
- loss: 0.2230 - acc: 0.9186 - auc_roc: 0.91 - ETA: 24s - loss: 0.2237 - acc:
0.9182 - auc_roc: 0.91 - ETA: 24s - loss: 0.2240 - acc: 0.9184 - auc_roc: 0.91 -
ETA: 23s - loss: 0.2228 - acc: 0.9189 - auc_roc: 0.91 - ETA: 22s - loss: 0.2230
- acc: 0.9186 - auc_roc: 0.91 - ETA: 22s - loss: 0.2240 - acc: 0.9182 - auc_roc:
0.91 - ETA: 21s - loss: 0.2237 - acc: 0.9184 - auc_roc: 0.91 - ETA: 20s - loss:
0.2240 - acc: 0.9182 - auc_roc: 0.91 - ETA: 20s - loss: 0.2247 - acc: 0.9178 -
auc_roc: 0.91 - ETA: 19s - loss: 0.2242 - acc: 0.9178 - auc_roc: 0.91 - ETA: 18s
- loss: 0.2245 - acc: 0.9177 - auc_roc: 0.91 - ETA: 18s - loss: 0.2255 - acc:
0.9171 - auc_roc: 0.91 - ETA: 17s - loss: 0.2255 - acc: 0.9171 - auc_roc: 0.91 -
ETA: 16s - loss: 0.2255 - acc: 0.9171 - auc_roc: 0.91 - ETA: 16s - loss: 0.2256
- acc: 0.9170 - auc_roc: 0.91 - ETA: 15s - loss: 0.2262 - acc: 0.9165 - auc_roc:
0.91 - ETA: 14s - loss: 0.2262 - acc: 0.9166 - auc_roc: 0.91 - ETA: 14s - loss:
0.2269 - acc: 0.9162 - auc_roc: 0.91 - ETA: 13s - loss: 0.2264 - acc: 0.9164 -
auc_roc: 0.91 - ETA: 12s - loss: 0.2266 - acc: 0.9164 - auc_roc: 0.91 - ETA: 12s
- loss: 0.2266 - acc: 0.9164 - auc_roc: 0.91 - ETA: 11s - loss: 0.2267 - acc:
0.9162 - auc_roc: 0.91 - ETA: 10s - loss: 0.2274 - acc: 0.9158 - auc_roc: 0.91 -
ETA: 10s - loss: 0.2277 - acc: 0.9156 - auc_roc: 0.91 - ETA: 9s - loss: 0.2279 -
acc: 0.9154 - auc_roc: 0.9146 - ETA: 8s - loss: 0.2276 - acc: 0.9155 - auc_roc:
0.914 - ETA: 8s - loss: 0.2274 - acc: 0.9155 - auc_roc: 0.915 - ETA: 7s - loss:
0.2280 - acc: 0.9152 - auc_roc: 0.914 - ETA: 6s - loss: 0.2278 - acc: 0.9152 -
auc_roc: 0.914 - ETA: 6s - loss: 0.2284 - acc: 0.9150 - auc_roc: 0.914 - ETA: 5s
```

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- loss: 0.2283 - acc: 0.9151 - auc_roc: 0.914 - ETA: 4s - loss: 0.2285 - acc:
0.9151 - auc_roc: 0.914 - ETA: 4s - loss: 0.2289 - acc: 0.9150 - auc_roc: 0.913
- ETA: 3s - loss: 0.2290 - acc: 0.9150 - auc_roc: 0.913 - ETA: 2s - loss: 0.2285
- acc: 0.9153 - auc_roc: 0.913 - ETA: 2s - loss: 0.2287 - acc: 0.9151 - auc_roc:
0.913 - ETA: 1s - loss: 0.2286 - acc: 0.9151 - auc_roc: 0.913 - ETA: 0s - loss:
0.2286 - acc: 0.9151 - auc_roc: 0.913 - ETA: 0s - loss: 0.2288 - acc: 0.9150 -
auc_roc: 0.913 - 51s 732us/step - loss: 0.2286 - acc: 0.9151 - auc_roc: 0.9137 -
val_loss: 0.5480 - val_acc: 0.8347 - val_auc_roc: 0.6848

Epoch 00021: val_auc_roc did not improve from 0.75507
Epoch 22/50
69918/69918 [==============================] - ETA: 43s - loss: 0.2058 - acc:
0.9268 - auc_roc: 0.93 - ETA: 43s - loss: 0.2130 - acc: 0.9199 - auc_roc: 0.93 -
ETA: 43s - loss: 0.2178 - acc: 0.9167 - auc_roc: 0.93 - ETA: 42s - loss: 0.2172
- acc: 0.9185 - auc_roc: 0.93 - ETA: 42s - loss: 0.2149 - acc: 0.9193 - auc_roc:
0.93 - ETA: 41s - loss: 0.2112 - acc: 0.9202 - auc_roc: 0.93 - ETA: 40s - loss:
0.2101 - acc: 0.9216 - auc_roc: 0.93 - ETA: 39s - loss: 0.2094 - acc: 0.9219 -
auc_roc: 0.93 - ETA: 38s - loss: 0.2082 - acc: 0.9220 - auc_roc: 0.93 - ETA: 38s
- loss: 0.2072 - acc: 0.9223 - auc_roc: 0.93 - ETA: 37s - loss: 0.2057 - acc:
0.9235 - auc_roc: 0.93 - ETA: 36s - loss: 0.2049 - acc: 0.9239 - auc_roc: 0.93 -
ETA: 36s - loss: 0.2044 - acc: 0.9244 - auc_roc: 0.93 - ETA: 35s - loss: 0.2036
- acc: 0.9251 - auc_roc: 0.93 - ETA: 34s - loss: 0.2065 - acc: 0.9234 - auc_roc:
0.93 - ETA: 34s - loss: 0.2047 - acc: 0.9245 - auc_roc: 0.93 - ETA: 33s - loss:
0.2041 - acc: 0.9248 - auc_roc: 0.93 - ETA: 32s - loss: 0.2044 - acc: 0.9245 -
auc_roc: 0.93 - ETA: 32s - loss: 0.2036 - acc: 0.9251 - auc_roc: 0.93 - ETA: 31s
- loss: 0.2042 - acc: 0.9250 - auc_roc: 0.93 - ETA: 30s - loss: 0.2039 - acc:
0.9249 - auc_roc: 0.93 - ETA: 30s - loss: 0.2038 - acc: 0.9249 - auc_roc: 0.93 -
ETA: 29s - loss: 0.2032 - acc: 0.9252 - auc_roc: 0.93 - ETA: 29s - loss: 0.2040
- acc: 0.9253 - auc_roc: 0.93 - ETA: 28s - loss: 0.2042 - acc: 0.9252 - auc_roc:
0.93 - ETA: 27s - loss: 0.2051 - acc: 0.9248 - auc_roc: 0.92 - ETA: 27s - loss:
0.2066 - acc: 0.9239 - auc_roc: 0.92 - ETA: 26s - loss: 0.2056 - acc: 0.9244 -
auc_roc: 0.92 - ETA: 25s - loss: 0.2057 - acc: 0.9244 - auc_roc: 0.92 - ETA: 25s
- loss: 0.2050 - acc: 0.9246 - auc_roc: 0.93 - ETA: 24s - loss: 0.2066 - acc:
0.9241 - auc_roc: 0.92 - ETA: 23s - loss: 0.2067 - acc: 0.9241 - auc_roc: 0.92 -
ETA: 23s - loss: 0.2064 - acc: 0.9243 - auc_roc: 0.92 - ETA: 22s - loss: 0.2067
- acc: 0.9242 - auc_roc: 0.92 - ETA: 21s - loss: 0.2068 - acc: 0.9240 - auc_roc:
0.92 - ETA: 21s - loss: 0.2071 - acc: 0.9237 - auc_roc: 0.92 - ETA: 20s - loss:
0.2074 - acc: 0.9237 - auc_roc: 0.92 - ETA: 19s - loss: 0.2083 - acc: 0.9233 -
auc_roc: 0.92 - ETA: 19s - loss: 0.2083 - acc: 0.9234 - auc_roc: 0.92 - ETA: 18s
- loss: 0.2092 - acc: 0.9229 - auc_roc: 0.92 - ETA: 17s - loss: 0.2100 - acc:
0.9224 - auc_roc: 0.92 - ETA: 17s - loss: 0.2105 - acc: 0.9222 - auc_roc: 0.92 -
ETA: 16s - loss: 0.2103 - acc: 0.9223 - auc_roc: 0.92 - ETA: 16s - loss: 0.2105
- acc: 0.9221 - auc_roc: 0.92 - ETA: 15s - loss: 0.2100 - acc: 0.9224 - auc_roc:
0.92 - ETA: 14s - loss: 0.2105 - acc: 0.9222 - auc_roc: 0.92 - ETA: 14s - loss:
0.2104 - acc: 0.9222 - auc_roc: 0.92 - ETA: 13s - loss: 0.2107 - acc: 0.9222 -
auc_roc: 0.92 - ETA: 12s - loss: 0.2103 - acc: 0.9224 - auc_roc: 0.92 - ETA: 12s
- loss: 0.2108 - acc: 0.9223 - auc_roc: 0.92 - ETA: 11s - loss: 0.2111 - acc:
0.9222 - auc_roc: 0.92 - ETA: 10s - loss: 0.2115 - acc: 0.9219 - auc_roc: 0.92 -
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ETA: 10s - loss: 0.2116 - acc: 0.9219 - auc_roc: 0.92 - ETA: 9s - loss: 0.2116 -
acc: 0.9219 - auc_roc: 0.9262 - ETA: 8s - loss: 0.2116 - acc: 0.9219 - auc_roc:
0.926 - ETA: 8s - loss: 0.2118 - acc: 0.9218 - auc_roc: 0.925 - ETA: 7s - loss:
0.2121 - acc: 0.9218 - auc_roc: 0.925 - ETA: 6s - loss: 0.2124 - acc: 0.9218 -
auc_roc: 0.925 - ETA: 6s - loss: 0.2125 - acc: 0.9217 - auc_roc: 0.925 - ETA: 5s
- loss: 0.2127 - acc: 0.9217 - auc_roc: 0.924 - ETA: 4s - loss: 0.2129 - acc:
0.9217 - auc_roc: 0.924 - ETA: 4s - loss: 0.2130 - acc: 0.9217 - auc_roc: 0.924
- ETA: 3s - loss: 0.2132 - acc: 0.9217 - auc_roc: 0.924 - ETA: 2s - loss: 0.2137
- acc: 0.9215 - auc_roc: 0.923 - ETA: 2s - loss: 0.2142 - acc: 0.9214 - auc_roc:
0.923 - ETA: 1s - loss: 0.2137 - acc: 0.9216 - auc_roc: 0.923 - ETA: 0s - loss:
0.2142 - acc: 0.9215 - auc_roc: 0.923 - ETA: 0s - loss: 0.2144 - acc: 0.9215 -
auc_roc: 0.923 - 51s 729us/step - loss: 0.2145 - acc: 0.9215 - auc_roc: 0.9231 -
val_loss: 0.5539 - val_acc: 0.8357 - val_auc_roc: 0.6724

Epoch 00022: val_auc_roc did not improve from 0.75507
Epoch 23/50
69918/69918 [==============================] - ETA: 42s - loss: 0.1923 - acc:
0.9268 - auc_roc: 0.93 - ETA: 44s - loss: 0.1960 - acc: 0.9268 - auc_roc: 0.93 -
ETA: 43s - loss: 0.1852 - acc: 0.9313 - auc_roc: 0.94 - ETA: 42s - loss: 0.1863
- acc: 0.9307 - auc_roc: 0.94 - ETA: 41s - loss: 0.1846 - acc: 0.9314 - auc_roc:
0.94 - ETA: 40s - loss: 0.1902 - acc: 0.9297 - auc_roc: 0.94 - ETA: 40s - loss:
0.1898 - acc: 0.9297 - auc_roc: 0.94 - ETA: 39s - loss: 0.1907 - acc: 0.9292 -
auc_roc: 0.93 - ETA: 39s - loss: 0.1911 - acc: 0.9288 - auc_roc: 0.93 - ETA: 38s
- loss: 0.1919 - acc: 0.9295 - auc_roc: 0.93 - ETA: 37s - loss: 0.1912 - acc:
0.9294 - auc_roc: 0.93 - ETA: 37s - loss: 0.1920 - acc: 0.9288 - auc_roc: 0.93 -
ETA: 36s - loss: 0.1907 - acc: 0.9289 - auc_roc: 0.93 - ETA: 36s - loss: 0.1913
- acc: 0.9286 - auc_roc: 0.93 - ETA: 35s - loss: 0.1949 - acc: 0.9277 - auc_roc:
0.93 - ETA: 34s - loss: 0.1942 - acc: 0.9285 - auc_roc: 0.93 - ETA: 33s - loss:
0.1959 - acc: 0.9279 - auc_roc: 0.93 - ETA: 33s - loss: 0.1945 - acc: 0.9282 -
auc_roc: 0.93 - ETA: 32s - loss: 0.1947 - acc: 0.9278 - auc_roc: 0.93 - ETA: 32s
- loss: 0.1963 - acc: 0.9274 - auc_roc: 0.93 - ETA: 31s - loss: 0.1964 - acc:
0.9275 - auc_roc: 0.93 - ETA: 30s - loss: 0.1967 - acc: 0.9272 - auc_roc: 0.93 -
ETA: 30s - loss: 0.1967 - acc: 0.9274 - auc_roc: 0.93 - ETA: 29s - loss: 0.1973
- acc: 0.9272 - auc_roc: 0.93 - ETA: 28s - loss: 0.1973 - acc: 0.9274 - auc_roc:
0.93 - ETA: 27s - loss: 0.1979 - acc: 0.9272 - auc_roc: 0.93 - ETA: 27s - loss:
0.1986 - acc: 0.9266 - auc_roc: 0.93 - ETA: 26s - loss: 0.1995 - acc: 0.9261 -
auc_roc: 0.93 - ETA: 25s - loss: 0.1998 - acc: 0.9261 - auc_roc: 0.93 - ETA: 25s
- loss: 0.2003 - acc: 0.9258 - auc_roc: 0.93 - ETA: 24s - loss: 0.2010 - acc:
0.9255 - auc_roc: 0.93 - ETA: 24s - loss: 0.2017 - acc: 0.9251 - auc_roc: 0.93 -
ETA: 23s - loss: 0.2010 - acc: 0.9254 - auc_roc: 0.93 - ETA: 22s - loss: 0.2010
- acc: 0.9254 - auc_roc: 0.93 - ETA: 22s - loss: 0.2013 - acc: 0.9254 - auc_roc:
0.93 - ETA: 21s - loss: 0.2011 - acc: 0.9254 - auc_roc: 0.93 - ETA: 20s - loss:
0.2007 - acc: 0.9255 - auc_roc: 0.93 - ETA: 20s - loss: 0.2004 - acc: 0.9255 -
auc_roc: 0.93 - ETA: 19s - loss: 0.2009 - acc: 0.9252 - auc_roc: 0.93 - ETA: 18s
- loss: 0.2004 - acc: 0.9254 - auc_roc: 0.93 - ETA: 18s - loss: 0.2008 - acc:
0.9252 - auc_roc: 0.93 - ETA: 17s - loss: 0.2017 - acc: 0.9247 - auc_roc: 0.93 -
ETA: 16s - loss: 0.2014 - acc: 0.9249 - auc_roc: 0.93 - ETA: 16s - loss: 0.2017
- acc: 0.9247 - auc_roc: 0.93 - ETA: 15s - loss: 0.2025 - acc: 0.9242 - auc_roc:
```

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0.93 - ETA: 14s - loss: 0.2027 - acc: 0.9242 - auc_roc: 0.93 - ETA: 14s - loss:
0.2030 - acc: 0.9241 - auc_roc: 0.93 - ETA: 13s - loss: 0.2031 - acc: 0.9241 -
auc_roc: 0.93 - ETA: 12s - loss: 0.2034 - acc: 0.9238 - auc_roc: 0.93 - ETA: 12s
- loss: 0.2031 - acc: 0.9240 - auc_roc: 0.93 - ETA: 11s - loss: 0.2043 - acc:
0.9236 - auc_roc: 0.93 - ETA: 10s - loss: 0.2042 - acc: 0.9236 - auc_roc: 0.93 -
ETA: 10s - loss: 0.2043 - acc: 0.9236 - auc_roc: 0.93 - ETA: 9s - loss: 0.2045 -
acc: 0.9236 - auc_roc: 0.9338 - ETA: 8s - loss: 0.2050 - acc: 0.9234 - auc_roc:
0.933 - ETA: 8s - loss: 0.2049 - acc: 0.9235 - auc_roc: 0.933 - ETA: 7s - loss:
0.2050 - acc: 0.9235 - auc_roc: 0.933 - ETA: 6s - loss: 0.2051 - acc: 0.9236 -
auc_roc: 0.933 - ETA: 6s - loss: 0.2053 - acc: 0.9234 - auc_roc: 0.933 - ETA: 5s
- loss: 0.2047 - acc: 0.9238 - auc_roc: 0.933 - ETA: 4s - loss: 0.2046 - acc:
0.9238 - auc_roc: 0.933 - ETA: 4s - loss: 0.2045 - acc: 0.9239 - auc_roc: 0.933
- ETA: 3s - loss: 0.2048 - acc: 0.9238 - auc_roc: 0.933 - ETA: 2s - loss: 0.2052
- acc: 0.9236 - auc_roc: 0.932 - ETA: 2s - loss: 0.2050 - acc: 0.9237 - auc_roc:
0.932 - ETA: 1s - loss: 0.2051 - acc: 0.9237 - auc_roc: 0.932 - ETA: 0s - loss:
0.2050 - acc: 0.9238 - auc_roc: 0.932 - ETA: 0s - loss: 0.2050 - acc: 0.9240 -
auc_roc: 0.932 - 51s 731us/step - loss: 0.2050 - acc: 0.9240 - auc_roc: 0.9326 -
val_loss: 0.5536 - val_acc: 0.8301 - val_auc_roc: 0.6618

Epoch 00023: val_auc_roc did not improve from 0.75507
Epoch 24/50
69918/69918 [==============================] - ETA: 45s - loss: 0.2055 - acc:
0.9258 - auc_roc: 0.93 - ETA: 43s - loss: 0.2004 - acc: 0.9277 - auc_roc: 0.93 -
ETA: 42s - loss: 0.1890 - acc: 0.9326 - auc_roc: 0.94 - ETA: 43s - loss: 0.1886
- acc: 0.9321 - auc_roc: 0.94 - ETA: 42s - loss: 0.1855 - acc: 0.9320 - auc_roc:
0.94 - ETA: 42s - loss: 0.1835 - acc: 0.9334 - auc_roc: 0.94 - ETA: 41s - loss:
0.1799 - acc: 0.9354 - auc_roc: 0.94 - ETA: 40s - loss: 0.1787 - acc: 0.9355 -
auc_roc: 0.94 - ETA: 39s - loss: 0.1803 - acc: 0.9352 - auc_roc: 0.94 - ETA: 39s
- loss: 0.1799 - acc: 0.9359 - auc_roc: 0.94 - ETA: 38s - loss: 0.1793 - acc:
0.9362 - auc_roc: 0.94 - ETA: 38s - loss: 0.1795 - acc: 0.9358 - auc_roc: 0.94 -
ETA: 37s - loss: 0.1808 - acc: 0.9350 - auc_roc: 0.94 - ETA: 36s - loss: 0.1821
- acc: 0.9344 - auc_roc: 0.94 - ETA: 35s - loss: 0.1826 - acc: 0.9342 - auc_roc:
0.94 - ETA: 35s - loss: 0.1824 - acc: 0.9341 - auc_roc: 0.94 - ETA: 34s - loss:
0.1816 - acc: 0.9343 - auc_roc: 0.94 - ETA: 33s - loss: 0.1815 - acc: 0.9340 -
auc_roc: 0.94 - ETA: 33s - loss: 0.1817 - acc: 0.9341 - auc_roc: 0.94 - ETA: 32s
- loss: 0.1817 - acc: 0.9340 - auc_roc: 0.94 - ETA: 31s - loss: 0.1832 - acc:
0.9334 - auc_roc: 0.94 - ETA: 30s - loss: 0.1844 - acc: 0.9324 - auc_roc: 0.94 -
ETA: 30s - loss: 0.1843 - acc: 0.9326 - auc_roc: 0.94 - ETA: 29s - loss: 0.1852
- acc: 0.9319 - auc_roc: 0.94 - ETA: 28s - loss: 0.1858 - acc: 0.9313 - auc_roc:
0.94 - ETA: 28s - loss: 0.1868 - acc: 0.9311 - auc_roc: 0.94 - ETA: 27s - loss:
0.1864 - acc: 0.9312 - auc_roc: 0.94 - ETA: 26s - loss: 0.1868 - acc: 0.9311 -
auc_roc: 0.94 - ETA: 26s - loss: 0.1870 - acc: 0.9308 - auc_roc: 0.94 - ETA: 25s
- loss: 0.1874 - acc: 0.9308 - auc_roc: 0.94 - ETA: 24s - loss: 0.1879 - acc:
0.9308 - auc_roc: 0.94 - ETA: 24s - loss: 0.1883 - acc: 0.9306 - auc_roc: 0.94 -
ETA: 23s - loss: 0.1883 - acc: 0.9306 - auc_roc: 0.94 - ETA: 22s - loss: 0.1879
- acc: 0.9308 - auc_roc: 0.94 - ETA: 22s - loss: 0.1888 - acc: 0.9303 - auc_roc:
0.94 - ETA: 21s - loss: 0.1897 - acc: 0.9300 - auc_roc: 0.94 - ETA: 20s - loss:
0.1899 - acc: 0.9300 - auc_roc: 0.94 - ETA: 20s - loss: 0.1905 - acc: 0.9298 -
```

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auc_roc: 0.94 - ETA: 19s - loss: 0.1898 - acc: 0.9300 - auc_roc: 0.94 - ETA: 18s
- loss: 0.1897 - acc: 0.9298 - auc_roc: 0.94 - ETA: 18s - loss: 0.1903 - acc:
0.9294 - auc_roc: 0.94 - ETA: 17s - loss: 0.1909 - acc: 0.9292 - auc_roc: 0.94 -
ETA: 16s - loss: 0.1909 - acc: 0.9291 - auc_roc: 0.94 - ETA: 16s - loss: 0.1906
- acc: 0.9292 - auc_roc: 0.94 - ETA: 15s - loss: 0.1909 - acc: 0.9290 - auc_roc:
0.94 - ETA: 14s - loss: 0.1902 - acc: 0.9292 - auc_roc: 0.94 - ETA: 14s - loss:
0.1895 - acc: 0.9297 - auc_roc: 0.94 - ETA: 13s - loss: 0.1892 - acc: 0.9298 -
auc_roc: 0.94 - ETA: 12s - loss: 0.1894 - acc: 0.9298 - auc_roc: 0.94 - ETA: 12s
- loss: 0.1894 - acc: 0.9298 - auc_roc: 0.94 - ETA: 11s - loss: 0.1897 - acc:
0.9298 - auc_roc: 0.94 - ETA: 10s - loss: 0.1895 - acc: 0.9297 - auc_roc: 0.94 -
ETA: 10s - loss: 0.1898 - acc: 0.9298 - auc_roc: 0.94 - ETA: 9s - loss: 0.1902 -
acc: 0.9297 - auc_roc: 0.9407 - ETA: 8s - loss: 0.1908 - acc: 0.9293 - auc_roc:
0.940 - ETA: 8s - loss: 0.1907 - acc: 0.9294 - auc_roc: 0.940 - ETA: 7s - loss:
0.1908 - acc: 0.9293 - auc_roc: 0.940 - ETA: 6s - loss: 0.1909 - acc: 0.9292 -
auc_roc: 0.940 - ETA: 6s - loss: 0.1906 - acc: 0.9293 - auc_roc: 0.940 - ETA: 5s
- loss: 0.1906 - acc: 0.9294 - auc_roc: 0.940 - ETA: 4s - loss: 0.1910 - acc:
0.9292 - auc_roc: 0.940 - ETA: 4s - loss: 0.1909 - acc: 0.9293 - auc_roc: 0.940
- ETA: 3s - loss: 0.1913 - acc: 0.9290 - auc_roc: 0.939 - ETA: 2s - loss: 0.1909
- acc: 0.9293 - auc_roc: 0.940 - ETA: 2s - loss: 0.1911 - acc: 0.9291 - auc_roc:
0.940 - ETA: 1s - loss: 0.1913 - acc: 0.9290 - auc_roc: 0.940 - ETA: 0s - loss:
0.1919 - acc: 0.9287 - auc_roc: 0.939 - ETA: 0s - loss: 0.1920 - acc: 0.9288 -
auc_roc: 0.939 - 51s 732us/step - loss: 0.1921 - acc: 0.9286 - auc_roc: 0.9396 -
val_loss: 0.6011 - val_acc: 0.8234 - val_auc_roc: 0.6621

Epoch 00024: val_auc_roc did not improve from 0.75507
Epoch 25/50
69918/69918 [==============================] - ETA: 46s - loss: 0.1946 - acc:
0.9209 - auc_roc: 0.95 - ETA: 44s - loss: 0.1803 - acc: 0.9341 - auc_roc: 0.95 -
ETA: 44s - loss: 0.1704 - acc: 0.9368 - auc_roc: 0.95 - ETA: 43s - loss: 0.1729
- acc: 0.9346 - auc_roc: 0.95 - ETA: 42s - loss: 0.1799 - acc: 0.9313 - auc_roc:
0.95 - ETA: 41s - loss: 0.1835 - acc: 0.9295 - auc_roc: 0.94 - ETA: 41s - loss:
0.1855 - acc: 0.9287 - auc_roc: 0.94 - ETA: 40s - loss: 0.1858 - acc: 0.9293 -
auc_roc: 0.94 - ETA: 39s - loss: 0.1871 - acc: 0.9280 - auc_roc: 0.94 - ETA: 38s
- loss: 0.1847 - acc: 0.9295 - auc_roc: 0.94 - ETA: 38s - loss: 0.1837 - acc:
0.9306 - auc_roc: 0.94 - ETA: 37s - loss: 0.1837 - acc: 0.9310 - auc_roc: 0.94 -
ETA: 36s - loss: 0.1822 - acc: 0.9313 - auc_roc: 0.94 - ETA: 36s - loss: 0.1796
- acc: 0.9324 - auc_roc: 0.95 - ETA: 35s - loss: 0.1805 - acc: 0.9324 - auc_roc:
0.94 - ETA: 34s - loss: 0.1798 - acc: 0.9322 - auc_roc: 0.95 - ETA: 34s - loss:
0.1790 - acc: 0.9327 - auc_roc: 0.95 - ETA: 33s - loss: 0.1797 - acc: 0.9329 -
auc_roc: 0.94 - ETA: 32s - loss: 0.1788 - acc: 0.9331 - auc_roc: 0.94 - ETA: 32s
- loss: 0.1788 - acc: 0.9335 - auc_roc: 0.94 - ETA: 31s - loss: 0.1786 - acc:
0.9335 - auc_roc: 0.94 - ETA: 30s - loss: 0.1785 - acc: 0.9337 - auc_roc: 0.94 -
ETA: 30s - loss: 0.1785 - acc: 0.9339 - auc_roc: 0.94 - ETA: 29s - loss: 0.1777
- acc: 0.9343 - auc_roc: 0.94 - ETA: 28s - loss: 0.1775 - acc: 0.9341 - auc_roc:
0.94 - ETA: 28s - loss: 0.1776 - acc: 0.9342 - auc_roc: 0.94 - ETA: 27s - loss:
0.1772 - acc: 0.9344 - auc_roc: 0.94 - ETA: 26s - loss: 0.1765 - acc: 0.9348 -
auc_roc: 0.95 - ETA: 26s - loss: 0.1767 - acc: 0.9344 - auc_roc: 0.95 - ETA: 25s
- loss: 0.1770 - acc: 0.9346 - auc_roc: 0.95 - ETA: 24s - loss: 0.1769 - acc:
```

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0.9346 - auc_roc: 0.95 - ETA: 24s - loss: 0.1762 - acc: 0.9350 - auc_roc: 0.95 -
ETA: 23s - loss: 0.1765 - acc: 0.9349 - auc_roc: 0.95 - ETA: 22s - loss: 0.1771
- acc: 0.9346 - auc_roc: 0.95 - ETA: 22s - loss: 0.1771 - acc: 0.9345 - auc_roc:
0.95 - ETA: 21s - loss: 0.1780 - acc: 0.9342 - auc_roc: 0.94 - ETA: 20s - loss:
0.1778 - acc: 0.9343 - auc_roc: 0.94 - ETA: 20s - loss: 0.1781 - acc: 0.9343 -
auc_roc: 0.94 - ETA: 19s - loss: 0.1781 - acc: 0.9343 - auc_roc: 0.94 - ETA: 18s
- loss: 0.1782 - acc: 0.9343 - auc_roc: 0.94 - ETA: 18s - loss: 0.1788 - acc:
0.9342 - auc_roc: 0.94 - ETA: 17s - loss: 0.1796 - acc: 0.9338 - auc_roc: 0.94 -
ETA: 16s - loss: 0.1802 - acc: 0.9333 - auc_roc: 0.94 - ETA: 16s - loss: 0.1801
- acc: 0.9333 - auc_roc: 0.94 - ETA: 15s - loss: 0.1810 - acc: 0.9329 - auc_roc:
0.94 - ETA: 14s - loss: 0.1813 - acc: 0.9330 - auc_roc: 0.94 - ETA: 14s - loss:
0.1812 - acc: 0.9330 - auc_roc: 0.94 - ETA: 13s - loss: 0.1811 - acc: 0.9332 -
auc_roc: 0.94 - ETA: 12s - loss: 0.1815 - acc: 0.9330 - auc_roc: 0.94 - ETA: 12s
- loss: 0.1810 - acc: 0.9331 - auc_roc: 0.94 - ETA: 11s - loss: 0.1818 - acc:
0.9328 - auc_roc: 0.94 - ETA: 10s - loss: 0.1818 - acc: 0.9328 - auc_roc: 0.94 -
ETA: 10s - loss: 0.1820 - acc: 0.9327 - auc_roc: 0.94 - ETA: 9s - loss: 0.1818 -
acc: 0.9327 - auc_roc: 0.9478 - ETA: 8s - loss: 0.1821 - acc: 0.9326 - auc_roc:
0.947 - ETA: 8s - loss: 0.1822 - acc: 0.9325 - auc_roc: 0.947 - ETA: 7s - loss:
0.1821 - acc: 0.9326 - auc_roc: 0.947 - ETA: 6s - loss: 0.1827 - acc: 0.9323 -
auc_roc: 0.947 - ETA: 6s - loss: 0.1828 - acc: 0.9323 - auc_roc: 0.946 - ETA: 5s
- loss: 0.1830 - acc: 0.9322 - auc_roc: 0.946 - ETA: 4s - loss: 0.1835 - acc:
0.9318 - auc_roc: 0.946 - ETA: 4s - loss: 0.1834 - acc: 0.9319 - auc_roc: 0.946
- ETA: 3s - loss: 0.1831 - acc: 0.9321 - auc_roc: 0.946 - ETA: 2s - loss: 0.1832
- acc: 0.9322 - auc_roc: 0.946 - ETA: 2s - loss: 0.1832 - acc: 0.9322 - auc_roc:
0.946 - ETA: 1s - loss: 0.1834 - acc: 0.9321 - auc_roc: 0.946 - ETA: 0s - loss:
0.1833 - acc: 0.9321 - auc_roc: 0.946 - ETA: 0s - loss: 0.1831 - acc: 0.9323 -
auc_roc: 0.946 - 51s 726us/step - loss: 0.1834 - acc: 0.9322 - auc_roc: 0.9465 -
val_loss: 0.6285 - val_acc: 0.8222 - val_auc_roc: 0.6626

Epoch 00025: val_auc_roc did not improve from 0.75507
Epoch 26/50
69918/69918 [==============================] - ETA: 45s - loss: 0.1649 - acc:
0.9473 - auc_roc: 0.95 - ETA: 44s - loss: 0.1725 - acc: 0.9419 - auc_roc: 0.95 -
ETA: 44s - loss: 0.1652 - acc: 0.9437 - auc_roc: 0.95 - ETA: 43s - loss: 0.1706
- acc: 0.9395 - auc_roc: 0.95 - ETA: 42s - loss: 0.1663 - acc: 0.9406 - auc_roc:
0.95 - ETA: 41s - loss: 0.1671 - acc: 0.9398 - auc_roc: 0.95 - ETA: 40s - loss:
0.1684 - acc: 0.9385 - auc_roc: 0.95 - ETA: 40s - loss: 0.1662 - acc: 0.9387 -
auc_roc: 0.95 - ETA: 39s - loss: 0.1645 - acc: 0.9400 - auc_roc: 0.95 - ETA: 38s
- loss: 0.1652 - acc: 0.9399 - auc_roc: 0.95 - ETA: 37s - loss: 0.1675 - acc:
0.9394 - auc_roc: 0.95 - ETA: 37s - loss: 0.1684 - acc: 0.9389 - auc_roc: 0.95 -
ETA: 36s - loss: 0.1692 - acc: 0.9386 - auc_roc: 0.95 - ETA: 35s - loss: 0.1673
- acc: 0.9394 - auc_roc: 0.95 - ETA: 35s - loss: 0.1656 - acc: 0.9402 - auc_roc:
0.95 - ETA: 34s - loss: 0.1645 - acc: 0.9401 - auc_roc: 0.95 - ETA: 33s - loss:
0.1665 - acc: 0.9396 - auc_roc: 0.95 - ETA: 33s - loss: 0.1659 - acc: 0.9398 -
auc_roc: 0.95 - ETA: 32s - loss: 0.1673 - acc: 0.9391 - auc_roc: 0.95 - ETA: 31s
- loss: 0.1676 - acc: 0.9391 - auc_roc: 0.95 - ETA: 31s - loss: 0.1680 - acc:
0.9386 - auc_roc: 0.95 - ETA: 30s - loss: 0.1693 - acc: 0.9382 - auc_roc: 0.95 -
ETA: 30s - loss: 0.1692 - acc: 0.9381 - auc_roc: 0.95 - ETA: 29s - loss: 0.1701
```

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- acc: 0.9377 - auc_roc: 0.95 - ETA: 28s - loss: 0.1713 - acc: 0.9370 - auc_roc:
0.95 - ETA: 28s - loss: 0.1718 - acc: 0.9367 - auc_roc: 0.95 - ETA: 27s - loss:
0.1719 - acc: 0.9366 - auc_roc: 0.95 - ETA: 26s - loss: 0.1716 - acc: 0.9368 -
auc_roc: 0.95 - ETA: 26s - loss: 0.1719 - acc: 0.9367 - auc_roc: 0.95 - ETA: 25s
- loss: 0.1729 - acc: 0.9362 - auc_roc: 0.95 - ETA: 24s - loss: 0.1729 - acc:
0.9362 - auc_roc: 0.95 - ETA: 24s - loss: 0.1722 - acc: 0.9365 - auc_roc: 0.95 -
ETA: 23s - loss: 0.1715 - acc: 0.9366 - auc_roc: 0.95 - ETA: 22s - loss: 0.1714
- acc: 0.9366 - auc_roc: 0.95 - ETA: 22s - loss: 0.1714 - acc: 0.9366 - auc_roc:
0.95 - ETA: 21s - loss: 0.1712 - acc: 0.9368 - auc_roc: 0.95 - ETA: 20s - loss:
0.1709 - acc: 0.9371 - auc_roc: 0.95 - ETA: 20s - loss: 0.1713 - acc: 0.9370 -
auc_roc: 0.95 - ETA: 19s - loss: 0.1714 - acc: 0.9370 - auc_roc: 0.95 - ETA: 18s
- loss: 0.1713 - acc: 0.9370 - auc_roc: 0.95 - ETA: 18s - loss: 0.1710 - acc:
0.9370 - auc_roc: 0.95 - ETA: 17s - loss: 0.1713 - acc: 0.9369 - auc_roc: 0.95 -
ETA: 16s - loss: 0.1721 - acc: 0.9365 - auc_roc: 0.95 - ETA: 16s - loss: 0.1725
- acc: 0.9364 - auc_roc: 0.95 - ETA: 15s - loss: 0.1726 - acc: 0.9364 - auc_roc:
0.95 - ETA: 14s - loss: 0.1728 - acc: 0.9362 - auc_roc: 0.95 - ETA: 14s - loss:
0.1729 - acc: 0.9362 - auc_roc: 0.95 - ETA: 13s - loss: 0.1734 - acc: 0.9361 -
auc_roc: 0.95 - ETA: 12s - loss: 0.1742 - acc: 0.9359 - auc_roc: 0.95 - ETA: 12s
- loss: 0.1745 - acc: 0.9358 - auc_roc: 0.95 - ETA: 11s - loss: 0.1746 - acc:
0.9358 - auc_roc: 0.95 - ETA: 10s - loss: 0.1743 - acc: 0.9359 - auc_roc: 0.95 -
ETA: 10s - loss: 0.1752 - acc: 0.9356 - auc_roc: 0.95 - ETA: 9s - loss: 0.1758 -
acc: 0.9352 - auc_roc: 0.9521 - ETA: 8s - loss: 0.1757 - acc: 0.9352 - auc_roc:
0.952 - ETA: 8s - loss: 0.1753 - acc: 0.9354 - auc_roc: 0.952 - ETA: 7s - loss:
0.1753 - acc: 0.9355 - auc_roc: 0.952 - ETA: 6s - loss: 0.1755 - acc: 0.9353 -
auc_roc: 0.952 - ETA: 6s - loss: 0.1758 - acc: 0.9351 - auc_roc: 0.951 - ETA: 5s
- loss: 0.1758 - acc: 0.9350 - auc_roc: 0.951 - ETA: 4s - loss: 0.1760 - acc:
0.9348 - auc_roc: 0.951 - ETA: 4s - loss: 0.1758 - acc: 0.9349 - auc_roc: 0.951
- ETA: 3s - loss: 0.1757 - acc: 0.9349 - auc_roc: 0.951 - ETA: 2s - loss: 0.1759
- acc: 0.9350 - auc_roc: 0.951 - ETA: 2s - loss: 0.1755 - acc: 0.9351 - auc_roc:
0.951 - ETA: 1s - loss: 0.1757 - acc: 0.9350 - auc_roc: 0.951 - ETA: 0s - loss:
0.1756 - acc: 0.9350 - auc_roc: 0.951 - ETA: 0s - loss: 0.1754 - acc: 0.9352 -
auc_roc: 0.951 - 51s 728us/step - loss: 0.1756 - acc: 0.9351 - auc_roc: 0.9516 -
val_loss: 0.6768 - val_acc: 0.8180 - val_auc_roc: 0.6475

Epoch 00026: val_auc_roc did not improve from 0.75507
Epoch 27/50
69918/69918 [==============================] - ETA: 45s - loss: 0.1350 - acc:
0.9561 - auc_roc: 0.97 - ETA: 43s - loss: 0.1360 - acc: 0.9546 - auc_roc: 0.97 -
ETA: 43s - loss: 0.1431 - acc: 0.9505 - auc_roc: 0.96 - ETA: 42s - loss: 0.1402
- acc: 0.9507 - auc_roc: 0.96 - ETA: 41s - loss: 0.1457 - acc: 0.9496 - auc_roc:
0.96 - ETA: 41s - loss: 0.1488 - acc: 0.9481 - auc_roc: 0.96 - ETA: 40s - loss:
0.1503 - acc: 0.9468 - auc_roc: 0.96 - ETA: 39s - loss: 0.1516 - acc: 0.9454 -
auc_roc: 0.96 - ETA: 39s - loss: 0.1535 - acc: 0.9447 - auc_roc: 0.96 - ETA: 38s
- loss: 0.1545 - acc: 0.9441 - auc_roc: 0.96 - ETA: 37s - loss: 0.1567 - acc:
0.9428 - auc_roc: 0.96 - ETA: 37s - loss: 0.1574 - acc: 0.9423 - auc_roc: 0.96 -
ETA: 36s - loss: 0.1546 - acc: 0.9437 - auc_roc: 0.96 - ETA: 36s - loss: 0.1549
- acc: 0.9434 - auc_roc: 0.96 - ETA: 35s - loss: 0.1535 - acc: 0.9441 - auc_roc:
0.96 - ETA: 34s - loss: 0.1528 - acc: 0.9441 - auc_roc: 0.96 - ETA: 34s - loss:
```

0.1509 - acc: 0.9443 - auc_roc: 0.96 - ETA: 33s - loss: 0.1521 - acc: 0.9440 - auc_roc: 0.96 - ETA: 32s - loss: 0.1515 - acc: 0.9443 - auc_roc: 0.96 - ETA: 32s - loss: 0.1524 - acc: 0.9437 - auc_roc: 0.96 - ETA: 31s - loss: 0.1531 - acc: 0.9433 - auc_roc: 0.96 - ETA: 30s - loss: 0.1539 - acc: 0.9431 - auc_roc: 0.96 - ETA: 30s - loss: 0.1547 - acc: 0.9428 - auc_roc: 0.96 - ETA: 29s - loss: 0.1551 - acc: 0.9427 - auc_roc: 0.96 - ETA: 28s - loss: 0.1563 - acc: 0.9423 - auc_roc: 0.96 - ETA: 28s - loss: 0.1558 - acc: 0.9426 - auc_roc: 0.96 - ETA: 27s - loss: 0.1556 - acc: 0.9426 - auc_roc: 0.96 - ETA: 26s - loss: 0.1553 - acc: 0.9431 - auc_roc: 0.96 - ETA: 26s - loss: 0.1552 - acc: 0.9431 - auc_roc: 0.96 - ETA: 25s - loss: 0.1559 - acc: 0.9428 - auc_roc: 0.96 - ETA: 24s - loss: 0.1558 - acc: 0.9426 - auc_roc: 0.96 - ETA: 24s - loss: 0.1556 - acc: 0.9427 - auc_roc: 0.96 - ETA: 23s - loss: 0.1562 - acc: 0.9426 - auc_roc: 0.96 - ETA: 22s - loss: 0.1562 - acc: 0.9424 - auc_roc: 0.96 - ETA: 22s - loss: 0.1565 - acc: 0.9423 - auc_roc: 0.96 - ETA: 21s - loss: 0.1577 - acc: 0.9416 - auc_roc: 0.96 - ETA: 20s - loss: 0.1572 - acc: 0.9418 - auc_roc: 0.96 - ETA: 20s - loss: 0.1581 - acc: 0.9415 - auc_roc: 0.96 - ETA: 19s - loss: 0.1593 - acc: 0.9409 - auc_roc: 0.96 - ETA: 18s - loss: 0.1599 - acc: 0.9407 - auc_roc: 0.96 - ETA: 18s - loss: 0.1605 - acc: 0.9405 - auc_roc: 0.96 - ETA: 17s - loss: 0.1602 - acc: 0.9407 - auc_roc: 0.96 - ETA: 16s - loss: 0.1603 - acc: 0.9405 - auc_roc: 0.96 - ETA: 16s - loss: 0.1605 - acc: 0.9405 - auc_roc: 0.96 - ETA: 15s - loss: 0.1609 - acc: 0.9402 - auc_roc: 0.96 - ETA: 14s - loss: 0.1607 - acc: 0.9402 - auc_roc: 0.96 - ETA: 14s - loss: 0.1610 - acc: 0.9401 - auc_roc: 0.95 - ETA: 13s - loss: 0.1615 - acc: 0.9399 - auc_roc: 0.95 - ETA: 12s - loss: 0.1611 - acc: 0.9402 - auc_roc: 0.95 - ETA: 12s - loss: 0.1615 - acc: 0.9399 - auc_roc: 0.95 - ETA: 11s - loss: 0.1610 - acc: 0.9401 - auc_roc: 0.95 - ETA: 10s - loss: 0.1613 - acc: 0.9401 - auc_roc: 0.95 - ETA: 10s - loss: 0.1613 - acc: 0.9401 - auc_roc: 0.95 - ETA: 9s - loss: 0.1615 - acc: 0.9401 - auc_roc: 0.9596 - ETA: 8s - loss: 0.1618 - acc: 0.9400 - auc_roc: 0.959 - ETA: 8s - loss: 0.1618 - acc: 0.9400 - auc_roc: 0.959 - ETA: 7s - loss: 0.1617 - acc: 0.9401 - auc_roc: 0.959 - ETA: 6s - loss: 0.1615 - acc: 0.9402 - auc_roc: 0.959 - ETA: 6s - loss: 0.1617 - acc: 0.9401 - auc_roc: 0.959 - ETA: 5s - loss: 0.1616 - acc: 0.9402 - auc_roc: 0.959 - ETA: 4s - loss: 0.1618 - acc: 0.9402 - auc_roc: 0.959 - ETA: 4s - loss: 0.1622 - acc: 0.9400 - auc_roc: 0.959 - ETA: 3s - loss: 0.1627 - acc: 0.9398 - auc_roc: 0.958 - ETA: 2s - loss: 0.1629 - acc: 0.9397 - auc_roc: 0.958 - ETA: 2s - loss: 0.1627 - acc: 0.9397 - auc_roc: 0.958 - ETA: 1s - loss: 0.1630 - acc: 0.9396 - auc_roc: 0.958 - ETA: 0s - loss: 0.1628 - acc: 0.9396 - auc_roc: 0.958 - ETA: 0s - loss: 0.1625 - acc: 0.9397 - auc_roc: 0.958 - 51s 732us/step - loss: 0.1625 - acc: 0.9397 - auc_roc: 0.9588 - val_loss: 0.7357 - val_acc: 0.8192 - val_auc_roc: 0.6655

Epoch 00027: val_auc_roc did not improve from 0.75507
Epoch 28/50
69918/69918 [==============================] - ETA: 45s - loss: 0.1259 - acc: 0.9521 - auc_roc: 0.97 - ETA: 44s - loss: 0.1372 - acc: 0.9473 - auc_roc: 0.97 - ETA: 44s - loss: 0.1409 - acc: 0.9469 - auc_roc: 0.97 - ETA: 43s - loss: 0.1444 - acc: 0.9431 - auc_roc: 0.97 - ETA: 42s - loss: 0.1465 - acc: 0.9436 - auc_roc: 0.96 - ETA: 41s - loss: 0.1410 - acc: 0.9465 - auc_roc: 0.97 - ETA: 40s - loss: 0.1379 - acc: 0.9488 - auc_roc: 0.97 - ETA: 40s - loss: 0.1356 - acc: 0.9493 - auc_roc: 0.97 - ETA: 39s - loss: 0.1359 - acc: 0.9494 - auc_roc: 0.97 - ETA: 39s

- loss: 0.1389 - acc: 0.9484 - auc_roc: 0.97 - ETA: 38s - loss: 0.1428 - acc:
0.9474 - auc_roc: 0.96 - ETA: 37s - loss: 0.1449 - acc: 0.9460 - auc_roc: 0.96 -
ETA: 36s - loss: 0.1427 - acc: 0.9472 - auc_roc: 0.96 - ETA: 36s - loss: 0.1432
- acc: 0.9470 - auc_roc: 0.96 - ETA: 35s - loss: 0.1435 - acc: 0.9464 - auc_roc:
0.96 - ETA: 34s - loss: 0.1427 - acc: 0.9467 - auc_roc: 0.96 - ETA: 34s - loss:
0.1452 - acc: 0.9458 - auc_roc: 0.96 - ETA: 33s - loss: 0.1459 - acc: 0.9456 -
auc_roc: 0.96 - ETA: 32s - loss: 0.1457 - acc: 0.9454 - auc_roc: 0.96 - ETA: 32s
- loss: 0.1459 - acc: 0.9453 - auc_roc: 0.96 - ETA: 31s - loss: 0.1453 - acc:
0.9454 - auc_roc: 0.96 - ETA: 30s - loss: 0.1464 - acc: 0.9446 - auc_roc: 0.96 -
ETA: 30s - loss: 0.1468 - acc: 0.9444 - auc_roc: 0.96 - ETA: 29s - loss: 0.1474
- acc: 0.9445 - auc_roc: 0.96 - ETA: 28s - loss: 0.1476 - acc: 0.9443 - auc_roc:
0.96 - ETA: 28s - loss: 0.1476 - acc: 0.9442 - auc_roc: 0.96 - ETA: 27s - loss:
0.1485 - acc: 0.9437 - auc_roc: 0.96 - ETA: 26s - loss: 0.1490 - acc: 0.9435 -
auc_roc: 0.96 - ETA: 26s - loss: 0.1487 - acc: 0.9435 - auc_roc: 0.96 - ETA: 25s
- loss: 0.1493 - acc: 0.9432 - auc_roc: 0.96 - ETA: 24s - loss: 0.1493 - acc:
0.9432 - auc_roc: 0.96 - ETA: 24s - loss: 0.1496 - acc: 0.9431 - auc_roc: 0.96 -
ETA: 23s - loss: 0.1489 - acc: 0.9434 - auc_roc: 0.96 - ETA: 22s - loss: 0.1495
- acc: 0.9431 - auc_roc: 0.96 - ETA: 22s - loss: 0.1498 - acc: 0.9429 - auc_roc:
0.96 - ETA: 21s - loss: 0.1500 - acc: 0.9429 - auc_roc: 0.96 - ETA: 20s - loss:
0.1502 - acc: 0.9428 - auc_roc: 0.96 - ETA: 20s - loss: 0.1502 - acc: 0.9428 -
auc_roc: 0.96 - ETA: 19s - loss: 0.1501 - acc: 0.9428 - auc_roc: 0.96 - ETA: 18s
- loss: 0.1506 - acc: 0.9425 - auc_roc: 0.96 - ETA: 18s - loss: 0.1507 - acc:
0.9426 - auc_roc: 0.96 - ETA: 17s - loss: 0.1509 - acc: 0.9427 - auc_roc: 0.96 -
ETA: 16s - loss: 0.1508 - acc: 0.9428 - auc_roc: 0.96 - ETA: 16s - loss: 0.1511
- acc: 0.9428 - auc_roc: 0.96 - ETA: 15s - loss: 0.1507 - acc: 0.9430 - auc_roc:
0.96 - ETA: 14s - loss: 0.1506 - acc: 0.9429 - auc_roc: 0.96 - ETA: 14s - loss:
0.1505 - acc: 0.9431 - auc_roc: 0.96 - ETA: 13s - loss: 0.1514 - acc: 0.9427 -
auc_roc: 0.96 - ETA: 12s - loss: 0.1511 - acc: 0.9428 - auc_roc: 0.96 - ETA: 12s
- loss: 0.1512 - acc: 0.9427 - auc_roc: 0.96 - ETA: 11s - loss: 0.1515 - acc:
0.9426 - auc_roc: 0.96 - ETA: 10s - loss: 0.1516 - acc: 0.9426 - auc_roc: 0.96 -
ETA: 10s - loss: 0.1518 - acc: 0.9425 - auc_roc: 0.96 - ETA: 9s - loss: 0.1520 -
acc: 0.9424 - auc_roc: 0.9647 - ETA: 8s - loss: 0.1522 - acc: 0.9425 - auc_roc:
0.964 - ETA: 8s - loss: 0.1520 - acc: 0.9425 - auc_roc: 0.964 - ETA: 7s - loss:
0.1524 - acc: 0.9424 - auc_roc: 0.964 - ETA: 6s - loss: 0.1528 - acc: 0.9425 -
auc_roc: 0.964 - ETA: 6s - loss: 0.1533 - acc: 0.9423 - auc_roc: 0.964 - ETA: 5s
- loss: 0.1532 - acc: 0.9423 - auc_roc: 0.964 - ETA: 4s - loss: 0.1533 - acc:
0.9422 - auc_roc: 0.964 - ETA: 4s - loss: 0.1540 - acc: 0.9418 - auc_roc: 0.964
- ETA: 3s - loss: 0.1539 - acc: 0.9420 - auc_roc: 0.963 - ETA: 2s - loss: 0.1542
- acc: 0.9418 - auc_roc: 0.963 - ETA: 2s - loss: 0.1542 - acc: 0.9419 - auc_roc:
0.963 - ETA: 1s - loss: 0.1543 - acc: 0.9420 - auc_roc: 0.963 - ETA: 0s - loss:
0.1542 - acc: 0.9421 - auc_roc: 0.963 - ETA: 0s - loss: 0.1544 - acc: 0.9421 -
auc_roc: 0.963 - 51s 734us/step - loss: 0.1545 - acc: 0.9420 - auc_roc: 0.9635 -
val_loss: 0.7599 - val_acc: 0.8286 - val_auc_roc: 0.6549

Epoch 00028: val_auc_roc did not improve from 0.75507
Epoch 29/50
69918/69918 [==============================] - ETA: 44s - loss: 0.1191 - acc:
0.9551 - auc_roc: 0.98 - ETA: 44s - loss: 0.1252 - acc: 0.9517 - auc_roc: 0.98 -

ETA: 43s - loss: 0.1307 - acc: 0.9512 - auc_roc: 0.97 - ETA: 42s - loss: 0.1379 - acc: 0.9490 - auc_roc: 0.97 - ETA: 42s - loss: 0.1396 - acc: 0.9477 - auc_roc: 0.97 - ETA: 41s - loss: 0.1400 - acc: 0.9473 - auc_roc: 0.97 - ETA: 41s - loss: 0.1415 - acc: 0.9463 - auc_roc: 0.97 - ETA: 40s - loss: 0.1400 - acc: 0.9467 - auc_roc: 0.97 - ETA: 39s - loss: 0.1409 - acc: 0.9465 - auc_roc: 0.97 - ETA: 39s - loss: 0.1405 - acc: 0.9463 - auc_roc: 0.97 - ETA: 38s - loss: 0.1398 - acc: 0.9462 - auc_roc: 0.97 - ETA: 38s - loss: 0.1413 - acc: 0.9462 - auc_roc: 0.97 - ETA: 37s - loss: 0.1394 - acc: 0.9478 - auc_roc: 0.97 - ETA: 36s - loss: 0.1400 - acc: 0.9471 - auc_roc: 0.97 - ETA: 35s - loss: 0.1405 - acc: 0.9469 - auc_roc: 0.97 - ETA: 35s - loss: 0.1406 - acc: 0.9467 - auc_roc: 0.97 - ETA: 34s - loss: 0.1407 - acc: 0.9466 - auc_roc: 0.97 - ETA: 33s - loss: 0.1403 - acc: 0.9468 - auc_roc: 0.97 - ETA: 32s - loss: 0.1397 - acc: 0.9470 - auc_roc: 0.97 - ETA: 32s - loss: 0.1400 - acc: 0.9467 - auc_roc: 0.97 - ETA: 31s - loss: 0.1395 - acc: 0.9470 - auc_roc: 0.97 - ETA: 30s - loss: 0.1399 - acc: 0.9469 - auc_roc: 0.97 - ETA: 30s - loss: 0.1388 - acc: 0.9475 - auc_roc: 0.97 - ETA: 29s - loss: 0.1388 - acc: 0.9475 - auc_roc: 0.97 - ETA: 28s - loss: 0.1380 - acc: 0.9475 - auc_roc: 0.97 - ETA: 28s - loss: 0.1383 - acc: 0.9476 - auc_roc: 0.97 - ETA: 27s - loss: 0.1394 - acc: 0.9474 - auc_roc: 0.97 - ETA: 26s - loss: 0.1394 - acc: 0.9473 - auc_roc: 0.97 - ETA: 26s - loss: 0.1394 - acc: 0.9471 - auc_roc: 0.97 - ETA: 25s - loss: 0.1393 - acc: 0.9472 - auc_roc: 0.97 - ETA: 24s - loss: 0.1389 - acc: 0.9474 - auc_roc: 0.97 - ETA: 24s - loss: 0.1385 - acc: 0.9477 - auc_roc: 0.97 - ETA: 23s - loss: 0.1389 - acc: 0.9476 - auc_roc: 0.97 - ETA: 22s - loss: 0.1387 - acc: 0.9479 - auc_roc: 0.97 - ETA: 21s - loss: 0.1387 - acc: 0.9479 - auc_roc: 0.97 - ETA: 21s - loss: 0.1385 - acc: 0.9480 - auc_roc: 0.97 - ETA: 20s - loss: 0.1382 - acc: 0.9483 - auc_roc: 0.97 - ETA: 20s - loss: 0.1380 - acc: 0.9483 - auc_roc: 0.97 - ETA: 19s - loss: 0.1380 - acc: 0.9482 - auc_roc: 0.97 - ETA: 18s - loss: 0.1375 - acc: 0.9485 - auc_roc: 0.97 - ETA: 18s - loss: 0.1373 - acc: 0.9484 - auc_roc: 0.97 - ETA: 17s - loss: 0.1373 - acc: 0.9485 - auc_roc: 0.97 - ETA: 16s - loss: 0.1383 - acc: 0.9481 - auc_roc: 0.97 - ETA: 16s - loss: 0.1386 - acc: 0.9480 - auc_roc: 0.97 - ETA: 15s - loss: 0.1392 - acc: 0.9477 - auc_roc: 0.97 - ETA: 14s - loss: 0.1394 - acc: 0.9476 - auc_roc: 0.97 - ETA: 14s - loss: 0.1404 - acc: 0.9472 - auc_roc: 0.97 - ETA: 13s - loss: 0.1404 - acc: 0.9473 - auc_roc: 0.97 - ETA: 12s - loss: 0.1407 - acc: 0.9474 - auc_roc: 0.97 - ETA: 12s - loss: 0.1402 - acc: 0.9476 - auc_roc: 0.97 - ETA: 11s - loss: 0.1403 - acc: 0.9473 - auc_roc: 0.97 - ETA: 10s - loss: 0.1404 - acc: 0.9473 - auc_roc: 0.97 - ETA: 10s - loss: 0.1409 - acc: 0.9471 - auc_roc: 0.97 - ETA: 9s - loss: 0.1410 - acc: 0.9471 - auc_roc: 0.9700 - ETA: 8s - loss: 0.1415 - acc: 0.9468 - auc_roc: 0.969 - ETA: 8s - loss: 0.1418 - acc: 0.9468 - auc_roc: 0.969 - ETA: 7s - loss: 0.1420 - acc: 0.9467 - auc_roc: 0.969 - ETA: 6s - loss: 0.1422 - acc: 0.9467 - auc_roc: 0.969 - ETA: 6s - loss: 0.1421 - acc: 0.9468 - auc_roc: 0.969 - ETA: 5s - loss: 0.1420 - acc: 0.9468 - auc_roc: 0.969 - ETA: 4s - loss: 0.1424 - acc: 0.9465 - auc_roc: 0.969 - ETA: 4s - loss: 0.1429 - acc: 0.9463 - auc_roc: 0.969 - ETA: 3s - loss: 0.1429 - acc: 0.9462 - auc_roc: 0.969 - ETA: 2s - loss: 0.1430 - acc: 0.9462 - auc_roc: 0.969 - ETA: 2s - loss: 0.1434 - acc: 0.9461 - auc_roc: 0.969 - ETA: 1s - loss: 0.1432 - acc: 0.9462 - auc_roc: 0.969 - ETA: 0s - loss: 0.1430 - acc: 0.9463 - auc_roc: 0.968 - ETA: 0s - loss: 0.1431 - acc: 0.9462 - auc_roc: 0.968 - 51s 726us/step - loss: 0.1432 - acc: 0.9461 - auc_roc: 0.9689 - val_loss: 0.8319 - val_acc: 0.8148 - val_auc_roc: 0.6569

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Epoch 00029: val_auc_roc did not improve from 0.75507
Epoch 30/50
69918/69918 [==============================] - ETA: 44s - loss: 0.1235 - acc:
0.9580 - auc_roc: 0.97 - ETA: 44s - loss: 0.1215 - acc: 0.9575 - auc_roc: 0.97 -
ETA: 43s - loss: 0.1206 - acc: 0.9570 - auc_roc: 0.97 - ETA: 43s - loss: 0.1241
- acc: 0.9546 - auc_roc: 0.97 - ETA: 42s - loss: 0.1256 - acc: 0.9539 - auc_roc:
0.97 - ETA: 41s - loss: 0.1297 - acc: 0.9533 - auc_roc: 0.97 - ETA: 41s - loss:
0.1268 - acc: 0.9544 - auc_roc: 0.97 - ETA: 40s - loss: 0.1261 - acc: 0.9547 -
auc_roc: 0.97 - ETA: 39s - loss: 0.1255 - acc: 0.9552 - auc_roc: 0.97 - ETA: 39s
- loss: 0.1268 - acc: 0.9547 - auc_roc: 0.97 - ETA: 38s - loss: 0.1265 - acc:
0.9546 - auc_roc: 0.97 - ETA: 37s - loss: 0.1247 - acc: 0.9554 - auc_roc: 0.97 -
ETA: 37s - loss: 0.1238 - acc: 0.9555 - auc_roc: 0.97 - ETA: 36s - loss: 0.1252
- acc: 0.9550 - auc_roc: 0.97 - ETA: 35s - loss: 0.1254 - acc: 0.9547 - auc_roc:
0.97 - ETA: 34s - loss: 0.1241 - acc: 0.9549 - auc_roc: 0.97 - ETA: 34s - loss:
0.1254 - acc: 0.9544 - auc_roc: 0.97 - ETA: 33s - loss: 0.1262 - acc: 0.9543 -
auc_roc: 0.97 - ETA: 33s - loss: 0.1271 - acc: 0.9542 - auc_roc: 0.97 - ETA: 32s
- loss: 0.1269 - acc: 0.9540 - auc_roc: 0.97 - ETA: 31s - loss: 0.1270 - acc:
0.9540 - auc_roc: 0.97 - ETA: 30s - loss: 0.1271 - acc: 0.9537 - auc_roc: 0.97 -
ETA: 30s - loss: 0.1274 - acc: 0.9535 - auc_roc: 0.97 - ETA: 29s - loss: 0.1269
- acc: 0.9539 - auc_roc: 0.97 - ETA: 28s - loss: 0.1262 - acc: 0.9541 - auc_roc:
0.97 - ETA: 28s - loss: 0.1264 - acc: 0.9539 - auc_roc: 0.97 - ETA: 27s - loss:
0.1268 - acc: 0.9536 - auc_roc: 0.97 - ETA: 26s - loss: 0.1280 - acc: 0.9533 -
auc_roc: 0.97 - ETA: 26s - loss: 0.1275 - acc: 0.9535 - auc_roc: 0.97 - ETA: 25s
- loss: 0.1285 - acc: 0.9532 - auc_roc: 0.97 - ETA: 24s - loss: 0.1296 - acc:
0.9526 - auc_roc: 0.97 - ETA: 24s - loss: 0.1293 - acc: 0.9526 - auc_roc: 0.97 -
ETA: 23s - loss: 0.1288 - acc: 0.9528 - auc_roc: 0.97 - ETA: 22s - loss: 0.1297
- acc: 0.9526 - auc_roc: 0.97 - ETA: 22s - loss: 0.1299 - acc: 0.9523 - auc_roc:
0.97 - ETA: 21s - loss: 0.1297 - acc: 0.9521 - auc_roc: 0.97 - ETA: 20s - loss:
0.1301 - acc: 0.9518 - auc_roc: 0.97 - ETA: 20s - loss: 0.1296 - acc: 0.9520 -
auc_roc: 0.97 - ETA: 19s - loss: 0.1296 - acc: 0.9521 - auc_roc: 0.97 - ETA: 18s
- loss: 0.1293 - acc: 0.9523 - auc_roc: 0.97 - ETA: 18s - loss: 0.1297 - acc:
0.9521 - auc_roc: 0.97 - ETA: 17s - loss: 0.1303 - acc: 0.9519 - auc_roc: 0.97 -
ETA: 16s - loss: 0.1304 - acc: 0.9518 - auc_roc: 0.97 - ETA: 16s - loss: 0.1314
- acc: 0.9513 - auc_roc: 0.97 - ETA: 15s - loss: 0.1315 - acc: 0.9512 - auc_roc:
0.97 - ETA: 14s - loss: 0.1313 - acc: 0.9514 - auc_roc: 0.97 - ETA: 14s - loss:
0.1313 - acc: 0.9513 - auc_roc: 0.97 - ETA: 13s - loss: 0.1319 - acc: 0.9512 -
auc_roc: 0.97 - ETA: 12s - loss: 0.1326 - acc: 0.9509 - auc_roc: 0.97 - ETA: 12s
- loss: 0.1326 - acc: 0.9509 - auc_roc: 0.97 - ETA: 11s - loss: 0.1327 - acc:
0.9508 - auc_roc: 0.97 - ETA: 10s - loss: 0.1329 - acc: 0.9505 - auc_roc: 0.97 -
ETA: 10s - loss: 0.1335 - acc: 0.9502 - auc_roc: 0.97 - ETA: 9s - loss: 0.1334 -
acc: 0.9502 - auc_roc: 0.9736 - ETA: 8s - loss: 0.1335 - acc: 0.9502 - auc_roc:
0.973 - ETA: 8s - loss: 0.1335 - acc: 0.9502 - auc_roc: 0.973 - ETA: 7s - loss:
0.1336 - acc: 0.9502 - auc_roc: 0.973 - ETA: 6s - loss: 0.1333 - acc: 0.9503 -
auc_roc: 0.973 - ETA: 6s - loss: 0.1335 - acc: 0.9502 - auc_roc: 0.973 - ETA: 5s
- loss: 0.1335 - acc: 0.9501 - auc_roc: 0.973 - ETA: 4s - loss: 0.1337 - acc:
0.9501 - auc_roc: 0.973 - ETA: 4s - loss: 0.1340 - acc: 0.9499 - auc_roc: 0.973
- ETA: 3s - loss: 0.1344 - acc: 0.9497 - auc_roc: 0.973 - ETA: 2s - loss: 0.1343
```

- acc: 0.9497 - auc_roc: 0.973 - ETA: 2s - loss: 0.1345 - acc: 0.9495 - auc_roc: 0.973 - ETA: 1s - loss: 0.1342 - acc: 0.9497 - auc_roc: 0.973 - ETA: 0s - loss: 0.1344 - acc: 0.9496 - auc_roc: 0.973 - ETA: 0s - loss: 0.1347 - acc: 0.9495 - auc_roc: 0.973 - 51s 732us/step - loss: 0.1347 - acc: 0.9495 - auc_roc: 0.9730 - val_loss: 0.8916 - val_acc: 0.8077 - val_auc_roc: 0.6615

Epoch 00030: val_auc_roc did not improve from 0.75507
Epoch 31/50
69918/69918 [==============================] - ETA: 44s - loss: 0.1440 - acc: 0.9443 - auc_roc: 0.97 - ETA: 43s - loss: 0.1428 - acc: 0.9443 - auc_roc: 0.97 - ETA: 42s - loss: 0.1339 - acc: 0.9489 - auc_roc: 0.97 - ETA: 41s - loss: 0.1340 - acc: 0.9475 - auc_roc: 0.97 - ETA: 41s - loss: 0.1369 - acc: 0.9469 - auc_roc: 0.97 - ETA: 40s - loss: 0.1333 - acc: 0.9479 - auc_roc: 0.97 - ETA: 40s - loss: 0.1318 - acc: 0.9495 - auc_roc: 0.97 - ETA: 39s - loss: 0.1321 - acc: 0.9503 - auc_roc: 0.97 - ETA: 39s - loss: 0.1324 - acc: 0.9492 - auc_roc: 0.97 - ETA: 38s - loss: 0.1330 - acc: 0.9489 - auc_roc: 0.97 - ETA: 37s - loss: 0.1304 - acc: 0.9499 - auc_roc: 0.97 - ETA: 37s - loss: 0.1296 - acc: 0.9502 - auc_roc: 0.97 - ETA: 36s - loss: 0.1276 - acc: 0.9505 - auc_roc: 0.97 - ETA: 35s - loss: 0.1272 - acc: 0.9508 - auc_roc: 0.97 - ETA: 35s - loss: 0.1256 - acc: 0.9512 - auc_roc: 0.97 - ETA: 34s - loss: 0.1242 - acc: 0.9519 - auc_roc: 0.97 - ETA: 33s - loss: 0.1247 - acc: 0.9517 - auc_roc: 0.97 - ETA: 33s - loss: 0.1246 - acc: 0.9516 - auc_roc: 0.97 - ETA: 32s - loss: 0.1250 - acc: 0.9516 - auc_roc: 0.97 - ETA: 31s - loss: 0.1249 - acc: 0.9520 - auc_roc: 0.97 - ETA: 31s - loss: 0.1242 - acc: 0.9524 - auc_roc: 0.97 - ETA: 30s - loss: 0.1235 - acc: 0.9528 - auc_roc: 0.97 - ETA: 29s - loss: 0.1239 - acc: 0.9528 - auc_roc: 0.97 - ETA: 29s - loss: 0.1239 - acc: 0.9528 - auc_roc: 0.97 - ETA: 28s - loss: 0.1243 - acc: 0.9524 - auc_roc: 0.97 - ETA: 27s - loss: 0.1249 - acc: 0.9521 - auc_roc: 0.97 - ETA: 27s - loss: 0.1238 - acc: 0.9527 - auc_roc: 0.97 - ETA: 26s - loss: 0.1243 - acc: 0.9526 - auc_roc: 0.97 - ETA: 25s - loss: 0.1246 - acc: 0.9525 - auc_roc: 0.97 - ETA: 25s - loss: 0.1246 - acc: 0.9522 - auc_roc: 0.97 - ETA: 24s - loss: 0.1247 - acc: 0.9524 - auc_roc: 0.97 - ETA: 23s - loss: 0.1248 - acc: 0.9522 - auc_roc: 0.97 - ETA: 23s - loss: 0.1246 - acc: 0.9524 - auc_roc: 0.97 - ETA: 22s - loss: 0.1249 - acc: 0.9522 - auc_roc: 0.97 - ETA: 22s - loss: 0.1250 - acc: 0.9522 - auc_roc: 0.97 - ETA: 21s - loss: 0.1247 - acc: 0.9524 - auc_roc: 0.97 - ETA: 20s - loss: 0.1249 - acc: 0.9525 - auc_roc: 0.97 - ETA: 20s - loss: 0.1242 - acc: 0.9528 - auc_roc: 0.97 - ETA: 19s - loss: 0.1240 - acc: 0.9529 - auc_roc: 0.97 - ETA: 18s - loss: 0.1241 - acc: 0.9530 - auc_roc: 0.97 - ETA: 18s - loss: 0.1233 - acc: 0.9533 - auc_roc: 0.97 - ETA: 17s - loss: 0.1234 - acc: 0.9532 - auc_roc: 0.97 - ETA: 16s - loss: 0.1237 - acc: 0.9530 - auc_roc: 0.97 - ETA: 16s - loss: 0.1240 - acc: 0.9529 - auc_roc: 0.97 - ETA: 15s - loss: 0.1238 - acc: 0.9530 - auc_roc: 0.97 - ETA: 14s - loss: 0.1241 - acc: 0.9529 - auc_roc: 0.97 - ETA: 14s - loss: 0.1239 - acc: 0.9531 - auc_roc: 0.97 - ETA: 13s - loss: 0.1246 - acc: 0.9528 - auc_roc: 0.97 - ETA: 12s - loss: 0.1255 - acc: 0.9524 - auc_roc: 0.97 - ETA: 12s - loss: 0.1256 - acc: 0.9523 - auc_roc: 0.97 - ETA: 11s - loss: 0.1260 - acc: 0.9521 - auc_roc: 0.97 - ETA: 10s - loss: 0.1264 - acc: 0.9519 - auc_roc: 0.97 - ETA: 10s - loss: 0.1263 - acc: 0.9520 - auc_roc: 0.97 - ETA: 9s - loss: 0.1269 - acc: 0.9519 - auc_roc: 0.9767 - ETA: 8s - loss: 0.1269 - acc: 0.9517 - auc_roc: 0.976 - ETA: 8s - loss: 0.1274 - acc: 0.9515 - auc_roc: 0.976 - ETA: 7s - loss:

```
0.1279 - acc: 0.9513 - auc_roc: 0.976 - ETA: 6s - loss: 0.1285 - acc: 0.9509 -
auc_roc: 0.976 - ETA: 6s - loss: 0.1285 - acc: 0.9510 - auc_roc: 0.976 - ETA: 5s
- loss: 0.1286 - acc: 0.9510 - auc_roc: 0.976 - ETA: 4s - loss: 0.1287 - acc:
0.9510 - auc_roc: 0.976 - ETA: 4s - loss: 0.1287 - acc: 0.9511 - auc_roc: 0.976
- ETA: 3s - loss: 0.1288 - acc: 0.9510 - auc_roc: 0.976 - ETA: 2s - loss: 0.1291
- acc: 0.9509 - auc_roc: 0.976 - ETA: 2s - loss: 0.1295 - acc: 0.9508 - auc_roc:
0.975 - ETA: 1s - loss: 0.1297 - acc: 0.9507 - auc_roc: 0.975 - ETA: 0s - loss:
0.1300 - acc: 0.9506 - auc_roc: 0.975 - ETA: 0s - loss: 0.1300 - acc: 0.9505 -
auc_roc: 0.975 - 51s 726us/step - loss: 0.1302 - acc: 0.9505 - auc_roc: 0.9757 -
val_loss: 0.8204 - val_acc: 0.8251 - val_auc_roc: 0.6524

Epoch 00031: val_auc_roc did not improve from 0.75507
Epoch 32/50
69918/69918 [==============================] - ETA: 46s - loss: 0.1043 - acc:
0.9580 - auc_roc: 0.98 - ETA: 45s - loss: 0.1094 - acc: 0.9575 - auc_roc: 0.98 -
ETA: 44s - loss: 0.1191 - acc: 0.9548 - auc_roc: 0.98 - ETA: 43s - loss: 0.1285
- acc: 0.9500 - auc_roc: 0.97 - ETA: 43s - loss: 0.1272 - acc: 0.9516 - auc_roc:
0.97 - ETA: 42s - loss: 0.1230 - acc: 0.9539 - auc_roc: 0.97 - ETA: 41s - loss:
0.1210 - acc: 0.9545 - auc_roc: 0.98 - ETA: 40s - loss: 0.1208 - acc: 0.9543 -
auc_roc: 0.98 - ETA: 40s - loss: 0.1203 - acc: 0.9537 - auc_roc: 0.98 - ETA: 39s
- loss: 0.1177 - acc: 0.9546 - auc_roc: 0.98 - ETA: 38s - loss: 0.1174 - acc:
0.9553 - auc_roc: 0.98 - ETA: 37s - loss: 0.1185 - acc: 0.9552 - auc_roc: 0.98 -
ETA: 37s - loss: 0.1170 - acc: 0.9559 - auc_roc: 0.98 - ETA: 36s - loss: 0.1166
- acc: 0.9562 - auc_roc: 0.98 - ETA: 35s - loss: 0.1152 - acc: 0.9570 - auc_roc:
0.98 - ETA: 35s - loss: 0.1146 - acc: 0.9573 - auc_roc: 0.98 - ETA: 34s - loss:
0.1156 - acc: 0.9570 - auc_roc: 0.98 - ETA: 33s - loss: 0.1156 - acc: 0.9568 -
auc_roc: 0.98 - ETA: 33s - loss: 0.1156 - acc: 0.9568 - auc_roc: 0.98 - ETA: 32s
- loss: 0.1152 - acc: 0.9568 - auc_roc: 0.98 - ETA: 31s - loss: 0.1150 - acc:
0.9569 - auc_roc: 0.98 - ETA: 30s - loss: 0.1149 - acc: 0.9572 - auc_roc: 0.98 -
ETA: 30s - loss: 0.1153 - acc: 0.9569 - auc_roc: 0.98 - ETA: 29s - loss: 0.1140
- acc: 0.9574 - auc_roc: 0.98 - ETA: 29s - loss: 0.1131 - acc: 0.9577 - auc_roc:
0.98 - ETA: 28s - loss: 0.1143 - acc: 0.9573 - auc_roc: 0.98 - ETA: 27s - loss:
0.1142 - acc: 0.9572 - auc_roc: 0.98 - ETA: 27s - loss: 0.1152 - acc: 0.9571 -
auc_roc: 0.98 - ETA: 26s - loss: 0.1152 - acc: 0.9572 - auc_roc: 0.98 - ETA: 25s
- loss: 0.1157 - acc: 0.9568 - auc_roc: 0.98 - ETA: 25s - loss: 0.1166 - acc:
0.9565 - auc_roc: 0.98 - ETA: 24s - loss: 0.1171 - acc: 0.9565 - auc_roc: 0.98 -
ETA: 23s - loss: 0.1176 - acc: 0.9563 - auc_roc: 0.98 - ETA: 23s - loss: 0.1168
- acc: 0.9564 - auc_roc: 0.98 - ETA: 22s - loss: 0.1163 - acc: 0.9565 - auc_roc:
0.98 - ETA: 21s - loss: 0.1177 - acc: 0.9562 - auc_roc: 0.98 - ETA: 20s - loss:
0.1179 - acc: 0.9563 - auc_roc: 0.98 - ETA: 20s - loss: 0.1189 - acc: 0.9561 -
auc_roc: 0.98 - ETA: 19s - loss: 0.1192 - acc: 0.9559 - auc_roc: 0.98 - ETA: 18s
- loss: 0.1196 - acc: 0.9556 - auc_roc: 0.97 - ETA: 18s - loss: 0.1196 - acc:
0.9553 - auc_roc: 0.97 - ETA: 17s - loss: 0.1198 - acc: 0.9552 - auc_roc: 0.97 -
ETA: 16s - loss: 0.1193 - acc: 0.9556 - auc_roc: 0.98 - ETA: 16s - loss: 0.1198
- acc: 0.9556 - auc_roc: 0.97 - ETA: 15s - loss: 0.1203 - acc: 0.9554 - auc_roc:
0.97 - ETA: 14s - loss: 0.1205 - acc: 0.9554 - auc_roc: 0.97 - ETA: 14s - loss:
0.1208 - acc: 0.9552 - auc_roc: 0.97 - ETA: 13s - loss: 0.1206 - acc: 0.9552 -
auc_roc: 0.97 - ETA: 12s - loss: 0.1213 - acc: 0.9549 - auc_roc: 0.97 - ETA: 12s
```

- loss: 0.1216 - acc: 0.9549 - auc_roc: 0.97 - ETA: 11s - loss: 0.1215 - acc:
0.9549 - auc_roc: 0.97 - ETA: 10s - loss: 0.1215 - acc: 0.9548 - auc_roc: 0.97 -
ETA: 10s - loss: 0.1218 - acc: 0.9545 - auc_roc: 0.97 - ETA: 9s - loss: 0.1222 -
acc: 0.9544 - auc_roc: 0.9794 - ETA: 8s - loss: 0.1220 - acc: 0.9545 - auc_roc:
0.979 - ETA: 8s - loss: 0.1220 - acc: 0.9545 - auc_roc: 0.979 - ETA: 7s - loss:
0.1220 - acc: 0.9545 - auc_roc: 0.979 - ETA: 6s - loss: 0.1226 - acc: 0.9542 -
auc_roc: 0.979 - ETA: 6s - loss: 0.1224 - acc: 0.9543 - auc_roc: 0.979 - ETA: 5s
- loss: 0.1227 - acc: 0.9541 - auc_roc: 0.978 - ETA: 4s - loss: 0.1228 - acc:
0.9540 - auc_roc: 0.978 - ETA: 4s - loss: 0.1229 - acc: 0.9539 - auc_roc: 0.978
- ETA: 3s - loss: 0.1228 - acc: 0.9539 - auc_roc: 0.978 - ETA: 2s - loss: 0.1228
- acc: 0.9538 - auc_roc: 0.978 - ETA: 2s - loss: 0.1227 - acc: 0.9538 - auc_roc:
0.979 - ETA: 1s - loss: 0.1230 - acc: 0.9538 - auc_roc: 0.978 - ETA: 0s - loss:
0.1228 - acc: 0.9539 - auc_roc: 0.978 - ETA: 0s - loss: 0.1224 - acc: 0.9541 -
auc_roc: 0.978 - 51s 732us/step - loss: 0.1222 - acc: 0.9541 - auc_roc: 0.9790 -
val_loss: 0.9243 - val_acc: 0.8224 - val_auc_roc: 0.6525

Epoch 00032: val_auc_roc did not improve from 0.75507
Epoch 33/50
69918/69918 [==============================] - ETA: 42s - loss: 0.0916 - acc:
0.9639 - auc_roc: 0.98 - ETA: 42s - loss: 0.0944 - acc: 0.9614 - auc_roc: 0.98 -
ETA: 42s - loss: 0.0956 - acc: 0.9616 - auc_roc: 0.98 - ETA: 41s - loss: 0.0981
- acc: 0.9600 - auc_roc: 0.98 - ETA: 41s - loss: 0.0976 - acc: 0.9607 - auc_roc:
0.98 - ETA: 40s - loss: 0.0986 - acc: 0.9616 - auc_roc: 0.98 - ETA: 40s - loss:
0.0973 - acc: 0.9628 - auc_roc: 0.98 - ETA: 39s - loss: 0.0967 - acc: 0.9624 -
auc_roc: 0.98 - ETA: 38s - loss: 0.0962 - acc: 0.9634 - auc_roc: 0.98 - ETA: 38s
- loss: 0.0958 - acc: 0.9636 - auc_roc: 0.98 - ETA: 37s - loss: 0.0965 - acc:
0.9636 - auc_roc: 0.98 - ETA: 37s - loss: 0.0975 - acc: 0.9640 - auc_roc: 0.98 -
ETA: 36s - loss: 0.0970 - acc: 0.9642 - auc_roc: 0.98 - ETA: 35s - loss: 0.0989
- acc: 0.9634 - auc_roc: 0.98 - ETA: 35s - loss: 0.0994 - acc: 0.9632 - auc_roc:
0.98 - ETA: 34s - loss: 0.1011 - acc: 0.9629 - auc_roc: 0.98 - ETA: 33s - loss:
0.1020 - acc: 0.9625 - auc_roc: 0.98 - ETA: 33s - loss: 0.1004 - acc: 0.9632 -
auc_roc: 0.98 - ETA: 32s - loss: 0.1004 - acc: 0.9631 - auc_roc: 0.98 - ETA: 31s
- loss: 0.1006 - acc: 0.9633 - auc_roc: 0.98 - ETA: 31s - loss: 0.1012 - acc:
0.9631 - auc_roc: 0.98 - ETA: 30s - loss: 0.1008 - acc: 0.9632 - auc_roc: 0.98 -
ETA: 29s - loss: 0.1011 - acc: 0.9632 - auc_roc: 0.98 - ETA: 29s - loss: 0.1018
- acc: 0.9629 - auc_roc: 0.98 - ETA: 28s - loss: 0.1026 - acc: 0.9626 - auc_roc:
0.98 - ETA: 28s - loss: 0.1031 - acc: 0.9621 - auc_roc: 0.98 - ETA: 27s - loss:
0.1032 - acc: 0.9620 - auc_roc: 0.98 - ETA: 26s - loss: 0.1032 - acc: 0.9619 -
auc_roc: 0.98 - ETA: 26s - loss: 0.1039 - acc: 0.9617 - auc_roc: 0.98 - ETA: 25s
- loss: 0.1035 - acc: 0.9618 - auc_roc: 0.98 - ETA: 24s - loss: 0.1040 - acc:
0.9617 - auc_roc: 0.98 - ETA: 24s - loss: 0.1039 - acc: 0.9618 - auc_roc: 0.98 -
ETA: 23s - loss: 0.1044 - acc: 0.9616 - auc_roc: 0.98 - ETA: 22s - loss: 0.1051
- acc: 0.9613 - auc_roc: 0.98 - ETA: 22s - loss: 0.1053 - acc: 0.9612 - auc_roc:
0.98 - ETA: 21s - loss: 0.1059 - acc: 0.9607 - auc_roc: 0.98 - ETA: 20s - loss:
0.1056 - acc: 0.9608 - auc_roc: 0.98 - ETA: 20s - loss: 0.1056 - acc: 0.9606 -
auc_roc: 0.98 - ETA: 19s - loss: 0.1069 - acc: 0.9601 - auc_roc: 0.98 - ETA: 18s
- loss: 0.1071 - acc: 0.9599 - auc_roc: 0.98 - ETA: 18s - loss: 0.1064 - acc:
0.9602 - auc_roc: 0.98 - ETA: 17s - loss: 0.1060 - acc: 0.9604 - auc_roc: 0.98 -

```
ETA: 16s - loss: 0.1060 - acc: 0.9603 - auc_roc: 0.98 - ETA: 16s - loss: 0.1057
- acc: 0.9604 - auc_roc: 0.98 - ETA: 15s - loss: 0.1054 - acc: 0.9606 - auc_roc:
0.98 - ETA: 14s - loss: 0.1059 - acc: 0.9604 - auc_roc: 0.98 - ETA: 14s - loss:
0.1059 - acc: 0.9604 - auc_roc: 0.98 - ETA: 13s - loss: 0.1060 - acc: 0.9604 -
auc_roc: 0.98 - ETA: 12s - loss: 0.1065 - acc: 0.9602 - auc_roc: 0.98 - ETA: 12s
- loss: 0.1067 - acc: 0.9601 - auc_roc: 0.98 - ETA: 11s - loss: 0.1074 - acc:
0.9597 - auc_roc: 0.98 - ETA: 10s - loss: 0.1076 - acc: 0.9596 - auc_roc: 0.98 -
ETA: 10s - loss: 0.1074 - acc: 0.9596 - auc_roc: 0.98 - ETA: 9s - loss: 0.1077 -
acc: 0.9596 - auc_roc: 0.9834 - ETA: 8s - loss: 0.1078 - acc: 0.9595 - auc_roc:
0.983 - ETA: 8s - loss: 0.1083 - acc: 0.9593 - auc_roc: 0.983 - ETA: 7s - loss:
0.1082 - acc: 0.9593 - auc_roc: 0.983 - ETA: 6s - loss: 0.1083 - acc: 0.9592 -
auc_roc: 0.983 - ETA: 6s - loss: 0.1086 - acc: 0.9591 - auc_roc: 0.983 - ETA: 5s
- loss: 0.1095 - acc: 0.9588 - auc_roc: 0.982 - ETA: 4s - loss: 0.1095 - acc:
0.9587 - auc_roc: 0.982 - ETA: 4s - loss: 0.1094 - acc: 0.9589 - auc_roc: 0.982
- ETA: 3s - loss: 0.1098 - acc: 0.9587 - auc_roc: 0.982 - ETA: 2s - loss: 0.1105
- acc: 0.9585 - auc_roc: 0.982 - ETA: 2s - loss: 0.1116 - acc: 0.9581 - auc_roc:
0.982 - ETA: 1s - loss: 0.1117 - acc: 0.9580 - auc_roc: 0.982 - ETA: 0s - loss:
0.1117 - acc: 0.9580 - auc_roc: 0.982 - ETA: 0s - loss: 0.1122 - acc: 0.9580 -
auc_roc: 0.981 - 51s 731us/step - loss: 0.1124 - acc: 0.9579 - auc_roc: 0.9818 -
val_loss: 0.8315 - val_acc: 0.8045 - val_auc_roc: 0.6459

Epoch 00033: val_auc_roc did not improve from 0.75507
Epoch 34/50
69918/69918 [==============================] - ETA: 42s - loss: 0.1243 - acc:
0.9531 - auc_roc: 0.98 - ETA: 43s - loss: 0.1196 - acc: 0.9551 - auc_roc: 0.98 -
ETA: 43s - loss: 0.1246 - acc: 0.9528 - auc_roc: 0.98 - ETA: 42s - loss: 0.1231
- acc: 0.9536 - auc_roc: 0.98 - ETA: 41s - loss: 0.1184 - acc: 0.9557 - auc_roc:
0.98 - ETA: 40s - loss: 0.1167 - acc: 0.9567 - auc_roc: 0.98 - ETA: 40s - loss:
0.1160 - acc: 0.9570 - auc_roc: 0.98 - ETA: 39s - loss: 0.1197 - acc: 0.9554 -
auc_roc: 0.98 - ETA: 38s - loss: 0.1162 - acc: 0.9570 - auc_roc: 0.98 - ETA: 38s
- loss: 0.1176 - acc: 0.9570 - auc_roc: 0.98 - ETA: 38s - loss: 0.1159 - acc:
0.9576 - auc_roc: 0.98 - ETA: 37s - loss: 0.1158 - acc: 0.9574 - auc_roc: 0.98 -
ETA: 36s - loss: 0.1160 - acc: 0.9574 - auc_roc: 0.98 - ETA: 35s - loss: 0.1138
- acc: 0.9582 - auc_roc: 0.98 - ETA: 35s - loss: 0.1129 - acc: 0.9586 - auc_roc:
0.98 - ETA: 34s - loss: 0.1105 - acc: 0.9598 - auc_roc: 0.98 - ETA: 33s - loss:
0.1108 - acc: 0.9595 - auc_roc: 0.98 - ETA: 33s - loss: 0.1086 - acc: 0.9606 -
auc_roc: 0.98 - ETA: 32s - loss: 0.1082 - acc: 0.9606 - auc_roc: 0.98 - ETA: 31s
- loss: 0.1085 - acc: 0.9606 - auc_roc: 0.98 - ETA: 31s - loss: 0.1081 - acc:
0.9606 - auc_roc: 0.98 - ETA: 30s - loss: 0.1075 - acc: 0.9609 - auc_roc: 0.98 -
ETA: 30s - loss: 0.1074 - acc: 0.9611 - auc_roc: 0.98 - ETA: 29s - loss: 0.1072
- acc: 0.9614 - auc_roc: 0.98 - ETA: 28s - loss: 0.1068 - acc: 0.9615 - auc_roc:
0.98 - ETA: 28s - loss: 0.1068 - acc: 0.9614 - auc_roc: 0.98 - ETA: 27s - loss:
0.1068 - acc: 0.9612 - auc_roc: 0.98 - ETA: 26s - loss: 0.1069 - acc: 0.9609 -
auc_roc: 0.98 - ETA: 26s - loss: 0.1066 - acc: 0.9609 - auc_roc: 0.98 - ETA: 25s
- loss: 0.1066 - acc: 0.9609 - auc_roc: 0.98 - ETA: 24s - loss: 0.1069 - acc:
0.9608 - auc_roc: 0.98 - ETA: 24s - loss: 0.1066 - acc: 0.9608 - auc_roc: 0.98 -
ETA: 23s - loss: 0.1071 - acc: 0.9606 - auc_roc: 0.98 - ETA: 22s - loss: 0.1080
- acc: 0.9602 - auc_roc: 0.98 - ETA: 22s - loss: 0.1078 - acc: 0.9602 - auc_roc:
```

```
0.98 - ETA: 21s - loss: 0.1078 - acc: 0.9602 - auc_roc: 0.98 - ETA: 20s - loss:
0.1072 - acc: 0.9603 - auc_roc: 0.98 - ETA: 20s - loss: 0.1067 - acc: 0.9606 -
auc_roc: 0.98 - ETA: 19s - loss: 0.1068 - acc: 0.9605 - auc_roc: 0.98 - ETA: 18s
- loss: 0.1069 - acc: 0.9604 - auc_roc: 0.98 - ETA: 18s - loss: 0.1076 - acc:
0.9600 - auc_roc: 0.98 - ETA: 17s - loss: 0.1076 - acc: 0.9600 - auc_roc: 0.98 -
ETA: 16s - loss: 0.1074 - acc: 0.9603 - auc_roc: 0.98 - ETA: 16s - loss: 0.1072
- acc: 0.9602 - auc_roc: 0.98 - ETA: 15s - loss: 0.1075 - acc: 0.9601 - auc_roc:
0.98 - ETA: 14s - loss: 0.1076 - acc: 0.9601 - auc_roc: 0.98 - ETA: 14s - loss:
0.1077 - acc: 0.9601 - auc_roc: 0.98 - ETA: 13s - loss: 0.1079 - acc: 0.9602 -
auc_roc: 0.98 - ETA: 12s - loss: 0.1077 - acc: 0.9602 - auc_roc: 0.98 - ETA: 12s
- loss: 0.1079 - acc: 0.9600 - auc_roc: 0.98 - ETA: 11s - loss: 0.1077 - acc:
0.9598 - auc_roc: 0.98 - ETA: 10s - loss: 0.1079 - acc: 0.9600 - auc_roc: 0.98 -
ETA: 10s - loss: 0.1080 - acc: 0.9599 - auc_roc: 0.98 - ETA: 9s - loss: 0.1077 -
acc: 0.9600 - auc_roc: 0.9840 - ETA: 8s - loss: 0.1079 - acc: 0.9599 - auc_roc:
0.983 - ETA: 8s - loss: 0.1083 - acc: 0.9597 - auc_roc: 0.983 - ETA: 7s - loss:
0.1082 - acc: 0.9597 - auc_roc: 0.983 - ETA: 6s - loss: 0.1083 - acc: 0.9596 -
auc_roc: 0.983 - ETA: 6s - loss: 0.1083 - acc: 0.9596 - auc_roc: 0.983 - ETA: 5s
- loss: 0.1083 - acc: 0.9597 - auc_roc: 0.983 - ETA: 4s - loss: 0.1083 - acc:
0.9598 - auc_roc: 0.983 - ETA: 4s - loss: 0.1084 - acc: 0.9597 - auc_roc: 0.983
- ETA: 3s - loss: 0.1085 - acc: 0.9597 - auc_roc: 0.983 - ETA: 2s - loss: 0.1087
- acc: 0.9596 - auc_roc: 0.983 - ETA: 2s - loss: 0.1087 - acc: 0.9596 - auc_roc:
0.983 - ETA: 1s - loss: 0.1089 - acc: 0.9595 - auc_roc: 0.983 - ETA: 0s - loss:
0.1092 - acc: 0.9595 - auc_roc: 0.983 - ETA: 0s - loss: 0.1096 - acc: 0.9593 -
auc_roc: 0.983 - 51s 729us/step - loss: 0.1097 - acc: 0.9593 - auc_roc: 0.9831 -
val_loss: 0.9624 - val_acc: 0.8211 - val_auc_roc: 0.6440

Epoch 00034: val_auc_roc did not improve from 0.75507
Epoch 35/50
69918/69918 [==============================] - ETA: 44s - loss: 0.0891 - acc:
0.9639 - auc_roc: 0.99 - ETA: 44s - loss: 0.0847 - acc: 0.9688 - auc_roc: 0.99 -
ETA: 43s - loss: 0.0907 - acc: 0.9648 - auc_roc: 0.98 - ETA: 42s - loss: 0.0948
- acc: 0.9641 - auc_roc: 0.98 - ETA: 41s - loss: 0.0944 - acc: 0.9645 - auc_roc:
0.98 - ETA: 40s - loss: 0.0957 - acc: 0.9634 - auc_roc: 0.98 - ETA: 40s - loss:
0.0941 - acc: 0.9641 - auc_roc: 0.98 - ETA: 39s - loss: 0.0948 - acc: 0.9636 -
auc_roc: 0.98 - ETA: 39s - loss: 0.0919 - acc: 0.9651 - auc_roc: 0.98 - ETA: 38s
- loss: 0.0902 - acc: 0.9658 - auc_roc: 0.98 - ETA: 37s - loss: 0.0910 - acc:
0.9654 - auc_roc: 0.98 - ETA: 37s - loss: 0.0898 - acc: 0.9658 - auc_roc: 0.98 -
ETA: 36s - loss: 0.0894 - acc: 0.9662 - auc_roc: 0.98 - ETA: 35s - loss: 0.0887
- acc: 0.9662 - auc_roc: 0.98 - ETA: 35s - loss: 0.0891 - acc: 0.9661 - auc_roc:
0.98 - ETA: 34s - loss: 0.0889 - acc: 0.9666 - auc_roc: 0.98 - ETA: 33s - loss:
0.0900 - acc: 0.9665 - auc_roc: 0.98 - ETA: 33s - loss: 0.0897 - acc: 0.9664 -
auc_roc: 0.98 - ETA: 32s - loss: 0.0898 - acc: 0.9662 - auc_roc: 0.98 - ETA: 32s
- loss: 0.0903 - acc: 0.9660 - auc_roc: 0.98 - ETA: 31s - loss: 0.0904 - acc:
0.9661 - auc_roc: 0.98 - ETA: 30s - loss: 0.0909 - acc: 0.9659 - auc_roc: 0.98 -
ETA: 30s - loss: 0.0912 - acc: 0.9658 - auc_roc: 0.98 - ETA: 29s - loss: 0.0919
- acc: 0.9655 - auc_roc: 0.98 - ETA: 28s - loss: 0.0922 - acc: 0.9653 - auc_roc:
0.98 - ETA: 28s - loss: 0.0927 - acc: 0.9651 - auc_roc: 0.98 - ETA: 27s - loss:
0.0923 - acc: 0.9653 - auc_roc: 0.98 - ETA: 26s - loss: 0.0924 - acc: 0.9651 -
```

```
auc_roc: 0.98 - ETA: 26s - loss: 0.0920 - acc: 0.9653 - auc_roc: 0.98 - ETA: 25s
- loss: 0.0923 - acc: 0.9653 - auc_roc: 0.98 - ETA: 24s - loss: 0.0922 - acc:
0.9653 - auc_roc: 0.98 - ETA: 24s - loss: 0.0917 - acc: 0.9654 - auc_roc: 0.98 -
ETA: 23s - loss: 0.0921 - acc: 0.9653 - auc_roc: 0.98 - ETA: 22s - loss: 0.0924
- acc: 0.9651 - auc_roc: 0.98 - ETA: 22s - loss: 0.0922 - acc: 0.9651 - auc_roc:
0.98 - ETA: 21s - loss: 0.0922 - acc: 0.9652 - auc_roc: 0.98 - ETA: 20s - loss:
0.0924 - acc: 0.9649 - auc_roc: 0.98 - ETA: 20s - loss: 0.0928 - acc: 0.9646 -
auc_roc: 0.98 - ETA: 19s - loss: 0.0931 - acc: 0.9644 - auc_roc: 0.98 - ETA: 18s
- loss: 0.0934 - acc: 0.9642 - auc_roc: 0.98 - ETA: 18s - loss: 0.0936 - acc:
0.9641 - auc_roc: 0.98 - ETA: 17s - loss: 0.0936 - acc: 0.9641 - auc_roc: 0.98 -
ETA: 16s - loss: 0.0935 - acc: 0.9641 - auc_roc: 0.98 - ETA: 16s - loss: 0.0932
- acc: 0.9643 - auc_roc: 0.98 - ETA: 15s - loss: 0.0936 - acc: 0.9641 - auc_roc:
0.98 - ETA: 14s - loss: 0.0934 - acc: 0.9642 - auc_roc: 0.98 - ETA: 14s - loss:
0.0934 - acc: 0.9642 - auc_roc: 0.98 - ETA: 13s - loss: 0.0934 - acc: 0.9643 -
auc_roc: 0.98 - ETA: 12s - loss: 0.0937 - acc: 0.9641 - auc_roc: 0.98 - ETA: 12s
- loss: 0.0935 - acc: 0.9643 - auc_roc: 0.98 - ETA: 11s - loss: 0.0937 - acc:
0.9641 - auc_roc: 0.98 - ETA: 10s - loss: 0.0938 - acc: 0.9641 - auc_roc: 0.98 -
ETA: 10s - loss: 0.0937 - acc: 0.9641 - auc_roc: 0.98 - ETA: 9s - loss: 0.0939 -
acc: 0.9641 - auc_roc: 0.9877 - ETA: 8s - loss: 0.0940 - acc: 0.9640 - auc_roc:
0.987 - ETA: 8s - loss: 0.0939 - acc: 0.9640 - auc_roc: 0.987 - ETA: 7s - loss:
0.0941 - acc: 0.9640 - auc_roc: 0.987 - ETA: 6s - loss: 0.0948 - acc: 0.9636 -
auc_roc: 0.987 - ETA: 6s - loss: 0.0949 - acc: 0.9636 - auc_roc: 0.987 - ETA: 5s
- loss: 0.0948 - acc: 0.9636 - auc_roc: 0.987 - ETA: 4s - loss: 0.0946 - acc:
0.9637 - auc_roc: 0.987 - ETA: 4s - loss: 0.0949 - acc: 0.9636 - auc_roc: 0.987
- ETA: 3s - loss: 0.0952 - acc: 0.9635 - auc_roc: 0.987 - ETA: 2s - loss: 0.0959
- acc: 0.9632 - auc_roc: 0.987 - ETA: 2s - loss: 0.0964 - acc: 0.9631 - auc_roc:
0.986 - ETA: 1s - loss: 0.0965 - acc: 0.9630 - auc_roc: 0.986 - ETA: 0s - loss:
0.0965 - acc: 0.9631 - auc_roc: 0.986 - ETA: 0s - loss: 0.0968 - acc: 0.9629 -
auc_roc: 0.986 - 51s 727us/step - loss: 0.0968 - acc: 0.9629 - auc_roc: 0.9868 -
val_loss: 0.9696 - val_acc: 0.8174 - val_auc_roc: 0.6487

Epoch 00035: val_auc_roc did not improve from 0.75507
Epoch 36/50
69918/69918 [==============================] - ETA: 46s - loss: 0.0886 - acc:
0.9678 - auc_roc: 0.98 - ETA: 45s - loss: 0.0878 - acc: 0.9673 - auc_roc: 0.98 -
ETA: 44s - loss: 0.0895 - acc: 0.9668 - auc_roc: 0.98 - ETA: 43s - loss: 0.0858
- acc: 0.9688 - auc_roc: 0.99 - ETA: 42s - loss: 0.0885 - acc: 0.9682 - auc_roc:
0.98 - ETA: 41s - loss: 0.0879 - acc: 0.9688 - auc_roc: 0.98 - ETA: 40s - loss:
0.0882 - acc: 0.9682 - auc_roc: 0.98 - ETA: 39s - loss: 0.0853 - acc: 0.9688 -
auc_roc: 0.98 - ETA: 39s - loss: 0.0852 - acc: 0.9683 - auc_roc: 0.99 - ETA: 38s
- loss: 0.0857 - acc: 0.9682 - auc_roc: 0.98 - ETA: 37s - loss: 0.0839 - acc:
0.9691 - auc_roc: 0.99 - ETA: 37s - loss: 0.0849 - acc: 0.9684 - auc_roc: 0.98 -
ETA: 36s - loss: 0.0842 - acc: 0.9686 - auc_roc: 0.99 - ETA: 35s - loss: 0.0836
- acc: 0.9692 - auc_roc: 0.99 - ETA: 34s - loss: 0.0820 - acc: 0.9697 - auc_roc:
0.99 - ETA: 34s - loss: 0.0830 - acc: 0.9692 - auc_roc: 0.99 - ETA: 33s - loss:
0.0828 - acc: 0.9693 - auc_roc: 0.99 - ETA: 33s - loss: 0.0836 - acc: 0.9688 -
auc_roc: 0.98 - ETA: 32s - loss: 0.0834 - acc: 0.9686 - auc_roc: 0.99 - ETA: 31s
- loss: 0.0841 - acc: 0.9683 - auc_roc: 0.99 - ETA: 31s - loss: 0.0853 - acc:
```

```
0.9676 - auc_roc: 0.98 - ETA: 30s - loss: 0.0850 - acc: 0.9676 - auc_roc: 0.98 -
ETA: 30s - loss: 0.0849 - acc: 0.9678 - auc_roc: 0.98 - ETA: 29s - loss: 0.0846
- acc: 0.9679 - auc_roc: 0.99 - ETA: 28s - loss: 0.0848 - acc: 0.9679 - auc_roc:
0.99 - ETA: 27s - loss: 0.0857 - acc: 0.9673 - auc_roc: 0.98 - ETA: 27s - loss:
0.0860 - acc: 0.9672 - auc_roc: 0.98 - ETA: 26s - loss: 0.0859 - acc: 0.9672 -
auc_roc: 0.98 - ETA: 25s - loss: 0.0862 - acc: 0.9669 - auc_roc: 0.98 - ETA: 25s
- loss: 0.0864 - acc: 0.9667 - auc_roc: 0.98 - ETA: 24s - loss: 0.0870 - acc:
0.9664 - auc_roc: 0.98 - ETA: 24s - loss: 0.0867 - acc: 0.9666 - auc_roc: 0.98 -
ETA: 23s - loss: 0.0866 - acc: 0.9667 - auc_roc: 0.98 - ETA: 22s - loss: 0.0874
- acc: 0.9663 - auc_roc: 0.98 - ETA: 21s - loss: 0.0880 - acc: 0.9659 - auc_roc:
0.98 - ETA: 21s - loss: 0.0877 - acc: 0.9661 - auc_roc: 0.98 - ETA: 20s - loss:
0.0879 - acc: 0.9661 - auc_roc: 0.98 - ETA: 19s - loss: 0.0875 - acc: 0.9664 -
auc_roc: 0.98 - ETA: 19s - loss: 0.0876 - acc: 0.9665 - auc_roc: 0.98 - ETA: 18s
- loss: 0.0874 - acc: 0.9665 - auc_roc: 0.98 - ETA: 18s - loss: 0.0882 - acc:
0.9664 - auc_roc: 0.98 - ETA: 17s - loss: 0.0884 - acc: 0.9663 - auc_roc: 0.98 -
ETA: 16s - loss: 0.0883 - acc: 0.9663 - auc_roc: 0.98 - ETA: 16s - loss: 0.0886
- acc: 0.9662 - auc_roc: 0.98 - ETA: 15s - loss: 0.0882 - acc: 0.9665 - auc_roc:
0.98 - ETA: 14s - loss: 0.0888 - acc: 0.9663 - auc_roc: 0.98 - ETA: 14s - loss:
0.0887 - acc: 0.9664 - auc_roc: 0.98 - ETA: 13s - loss: 0.0886 - acc: 0.9664 -
auc_roc: 0.98 - ETA: 12s - loss: 0.0890 - acc: 0.9663 - auc_roc: 0.98 - ETA: 12s
- loss: 0.0890 - acc: 0.9663 - auc_roc: 0.98 - ETA: 11s - loss: 0.0897 - acc:
0.9661 - auc_roc: 0.98 - ETA: 10s - loss: 0.0898 - acc: 0.9660 - auc_roc: 0.98 -
ETA: 10s - loss: 0.0899 - acc: 0.9659 - auc_roc: 0.98 - ETA: 9s - loss: 0.0899 -
acc: 0.9658 - auc_roc: 0.9889 - ETA: 8s - loss: 0.0903 - acc: 0.9656 - auc_roc:
0.988 - ETA: 8s - loss: 0.0904 - acc: 0.9656 - auc_roc: 0.988 - ETA: 7s - loss:
0.0904 - acc: 0.9656 - auc_roc: 0.988 - ETA: 6s - loss: 0.0910 - acc: 0.9654 -
auc_roc: 0.988 - ETA: 6s - loss: 0.0913 - acc: 0.9653 - auc_roc: 0.988 - ETA: 5s
- loss: 0.0915 - acc: 0.9652 - auc_roc: 0.988 - ETA: 4s - loss: 0.0918 - acc:
0.9651 - auc_roc: 0.988 - ETA: 4s - loss: 0.0920 - acc: 0.9650 - auc_roc: 0.988
- ETA: 3s - loss: 0.0920 - acc: 0.9650 - auc_roc: 0.988 - ETA: 2s - loss: 0.0922
- acc: 0.9649 - auc_roc: 0.988 - ETA: 2s - loss: 0.0923 - acc: 0.9649 - auc_roc:
0.988 - ETA: 1s - loss: 0.0924 - acc: 0.9648 - auc_roc: 0.988 - ETA: 0s - loss:
0.0925 - acc: 0.9648 - auc_roc: 0.988 - ETA: 0s - loss: 0.0923 - acc: 0.9649 -
auc_roc: 0.988 - 51s 725us/step - loss: 0.0923 - acc: 0.9649 - auc_roc: 0.9881 -
val_loss: 1.0398 - val_acc: 0.8153 - val_auc_roc: 0.6568

Epoch 00036: val_auc_roc did not improve from 0.75507
Epoch 37/50
69918/69918 [==============================] - ETA: 42s - loss: 0.0804 - acc:
0.9736 - auc_roc: 0.99 - ETA: 43s - loss: 0.0831 - acc: 0.9688 - auc_roc: 0.99 -
ETA: 42s - loss: 0.0823 - acc: 0.9701 - auc_roc: 0.99 - ETA: 41s - loss: 0.0806
- acc: 0.9707 - auc_roc: 0.99 - ETA: 41s - loss: 0.0882 - acc: 0.9676 - auc_roc:
0.98 - ETA: 40s - loss: 0.0859 - acc: 0.9683 - auc_roc: 0.98 - ETA: 39s - loss:
0.0851 - acc: 0.9678 - auc_roc: 0.99 - ETA: 39s - loss: 0.0839 - acc: 0.9680 -
auc_roc: 0.99 - ETA: 38s - loss: 0.0835 - acc: 0.9680 - auc_roc: 0.99 - ETA: 38s
- loss: 0.0829 - acc: 0.9685 - auc_roc: 0.99 - ETA: 37s - loss: 0.0812 - acc:
0.9692 - auc_roc: 0.99 - ETA: 36s - loss: 0.0804 - acc: 0.9693 - auc_roc: 0.99 -
ETA: 36s - loss: 0.0791 - acc: 0.9705 - auc_roc: 0.99 - ETA: 35s - loss: 0.0795
```

- acc: 0.9705 - auc_roc: 0.99 - ETA: 34s - loss: 0.0787 - acc: 0.9708 - auc_roc:
0.99 - ETA: 34s - loss: 0.0773 - acc: 0.9711 - auc_roc: 0.99 - ETA: 33s - loss:
0.0783 - acc: 0.9705 - auc_roc: 0.99 - ETA: 32s - loss: 0.0777 - acc: 0.9707 -
auc_roc: 0.99 - ETA: 32s - loss: 0.0783 - acc: 0.9706 - auc_roc: 0.99 - ETA: 31s
- loss: 0.0788 - acc: 0.9702 - auc_roc: 0.99 - ETA: 31s - loss: 0.0795 - acc:
0.9698 - auc_roc: 0.99 - ETA: 30s - loss: 0.0794 - acc: 0.9700 - auc_roc: 0.99 -
ETA: 29s - loss: 0.0795 - acc: 0.9699 - auc_roc: 0.99 - ETA: 29s - loss: 0.0791
- acc: 0.9702 - auc_roc: 0.99 - ETA: 28s - loss: 0.0787 - acc: 0.9705 - auc_roc:
0.99 - ETA: 27s - loss: 0.0792 - acc: 0.9702 - auc_roc: 0.99 - ETA: 27s - loss:
0.0794 - acc: 0.9700 - auc_roc: 0.99 - ETA: 26s - loss: 0.0804 - acc: 0.9696 -
auc_roc: 0.99 - ETA: 25s - loss: 0.0809 - acc: 0.9692 - auc_roc: 0.99 - ETA: 25s
- loss: 0.0803 - acc: 0.9695 - auc_roc: 0.99 - ETA: 24s - loss: 0.0801 - acc:
0.9695 - auc_roc: 0.99 - ETA: 24s - loss: 0.0795 - acc: 0.9697 - auc_roc: 0.99 -
ETA: 23s - loss: 0.0796 - acc: 0.9695 - auc_roc: 0.99 - ETA: 22s - loss: 0.0799
- acc: 0.9694 - auc_roc: 0.99 - ETA: 22s - loss: 0.0802 - acc: 0.9694 - auc_roc:
0.99 - ETA: 21s - loss: 0.0803 - acc: 0.9695 - auc_roc: 0.99 - ETA: 20s - loss:
0.0803 - acc: 0.9694 - auc_roc: 0.99 - ETA: 20s - loss: 0.0808 - acc: 0.9694 -
auc_roc: 0.99 - ETA: 19s - loss: 0.0811 - acc: 0.9692 - auc_roc: 0.99 - ETA: 18s
- loss: 0.0817 - acc: 0.9689 - auc_roc: 0.99 - ETA: 18s - loss: 0.0822 - acc:
0.9688 - auc_roc: 0.99 - ETA: 17s - loss: 0.0820 - acc: 0.9689 - auc_roc: 0.99 -
ETA: 16s - loss: 0.0827 - acc: 0.9685 - auc_roc: 0.99 - ETA: 16s - loss: 0.0832
- acc: 0.9683 - auc_roc: 0.99 - ETA: 15s - loss: 0.0834 - acc: 0.9682 - auc_roc:
0.99 - ETA: 14s - loss: 0.0835 - acc: 0.9681 - auc_roc: 0.99 - ETA: 14s - loss:
0.0833 - acc: 0.9681 - auc_roc: 0.99 - ETA: 13s - loss: 0.0836 - acc: 0.9680 -
auc_roc: 0.99 - ETA: 12s - loss: 0.0836 - acc: 0.9680 - auc_roc: 0.99 - ETA: 12s
- loss: 0.0843 - acc: 0.9678 - auc_roc: 0.99 - ETA: 11s - loss: 0.0845 - acc:
0.9678 - auc_roc: 0.99 - ETA: 10s - loss: 0.0847 - acc: 0.9677 - auc_roc: 0.99 -
ETA: 10s - loss: 0.0848 - acc: 0.9676 - auc_roc: 0.99 - ETA: 9s - loss: 0.0853 -
acc: 0.9674 - auc_roc: 0.9900 - ETA: 8s - loss: 0.0857 - acc: 0.9672 - auc_roc:
0.989 - ETA: 8s - loss: 0.0862 - acc: 0.9671 - auc_roc: 0.989 - ETA: 7s - loss:
0.0861 - acc: 0.9672 - auc_roc: 0.989 - ETA: 6s - loss: 0.0861 - acc: 0.9672 -
auc_roc: 0.989 - ETA: 6s - loss: 0.0866 - acc: 0.9669 - auc_roc: 0.989 - ETA: 5s
- loss: 0.0868 - acc: 0.9668 - auc_roc: 0.989 - ETA: 4s - loss: 0.0872 - acc:
0.9666 - auc_roc: 0.989 - ETA: 4s - loss: 0.0874 - acc: 0.9665 - auc_roc: 0.989
- ETA: 3s - loss: 0.0875 - acc: 0.9664 - auc_roc: 0.989 - ETA: 2s - loss: 0.0880
- acc: 0.9662 - auc_roc: 0.989 - ETA: 2s - loss: 0.0882 - acc: 0.9662 - auc_roc:
0.989 - ETA: 1s - loss: 0.0883 - acc: 0.9662 - auc_roc: 0.989 - ETA: 0s - loss:
0.0883 - acc: 0.9662 - auc_roc: 0.989 - ETA: 0s - loss: 0.0881 - acc: 0.9663 -
auc_roc: 0.989 - 51s 723us/step - loss: 0.0881 - acc: 0.9663 - auc_roc: 0.9894 -
val_loss: 1.1025 - val_acc: 0.8128 - val_auc_roc: 0.6611

Epoch 00037: val_auc_roc did not improve from 0.75507
Epoch 38/50
69918/69918 [==============================] - ETA: 42s - loss: 0.1129 - acc:
0.9600 - auc_roc: 0.98 - ETA: 42s - loss: 0.1082 - acc: 0.9634 - auc_roc: 0.98 -
ETA: 42s - loss: 0.0975 - acc: 0.9645 - auc_roc: 0.98 - ETA: 42s - loss: 0.0871
- acc: 0.9688 - auc_roc: 0.99 - ETA: 42s - loss: 0.0835 - acc: 0.9709 - auc_roc:
0.99 - ETA: 41s - loss: 0.0820 - acc: 0.9715 - auc_roc: 0.99 - ETA: 40s - loss:

```
0.0797 - acc: 0.9717 - auc_roc: 0.99 - ETA: 39s - loss: 0.0814 - acc: 0.9707 -
auc_roc: 0.99 - ETA: 39s - loss: 0.0802 - acc: 0.9711 - auc_roc: 0.99 - ETA: 38s
- loss: 0.0804 - acc: 0.9705 - auc_roc: 0.99 - ETA: 38s - loss: 0.0791 - acc:
0.9707 - auc_roc: 0.99 - ETA: 37s - loss: 0.0804 - acc: 0.9703 - auc_roc: 0.99 -
ETA: 36s - loss: 0.0796 - acc: 0.9708 - auc_roc: 0.99 - ETA: 36s - loss: 0.0821
- acc: 0.9697 - auc_roc: 0.99 - ETA: 35s - loss: 0.0822 - acc: 0.9697 - auc_roc:
0.99 - ETA: 34s - loss: 0.0833 - acc: 0.9691 - auc_roc: 0.99 - ETA: 34s - loss:
0.0831 - acc: 0.9689 - auc_roc: 0.99 - ETA: 33s - loss: 0.0836 - acc: 0.9687 -
auc_roc: 0.99 - ETA: 32s - loss: 0.0844 - acc: 0.9687 - auc_roc: 0.99 - ETA: 32s
- loss: 0.0838 - acc: 0.9689 - auc_roc: 0.99 - ETA: 31s - loss: 0.0836 - acc:
0.9691 - auc_roc: 0.99 - ETA: 30s - loss: 0.0840 - acc: 0.9691 - auc_roc: 0.99 -
ETA: 30s - loss: 0.0834 - acc: 0.9694 - auc_roc: 0.99 - ETA: 29s - loss: 0.0837
- acc: 0.9691 - auc_roc: 0.99 - ETA: 28s - loss: 0.0846 - acc: 0.9686 - auc_roc:
0.99 - ETA: 28s - loss: 0.0840 - acc: 0.9686 - auc_roc: 0.99 - ETA: 27s - loss:
0.0848 - acc: 0.9683 - auc_roc: 0.99 - ETA: 26s - loss: 0.0847 - acc: 0.9683 -
auc_roc: 0.99 - ETA: 26s - loss: 0.0844 - acc: 0.9683 - auc_roc: 0.99 - ETA: 25s
- loss: 0.0843 - acc: 0.9684 - auc_roc: 0.99 - ETA: 24s - loss: 0.0841 - acc:
0.9686 - auc_roc: 0.99 - ETA: 24s - loss: 0.0842 - acc: 0.9686 - auc_roc: 0.99 -
ETA: 23s - loss: 0.0835 - acc: 0.9688 - auc_roc: 0.99 - ETA: 22s - loss: 0.0842
- acc: 0.9687 - auc_roc: 0.99 - ETA: 22s - loss: 0.0849 - acc: 0.9684 - auc_roc:
0.99 - ETA: 21s - loss: 0.0850 - acc: 0.9684 - auc_roc: 0.99 - ETA: 20s - loss:
0.0849 - acc: 0.9684 - auc_roc: 0.99 - ETA: 20s - loss: 0.0853 - acc: 0.9683 -
auc_roc: 0.99 - ETA: 19s - loss: 0.0850 - acc: 0.9682 - auc_roc: 0.99 - ETA: 18s
- loss: 0.0851 - acc: 0.9682 - auc_roc: 0.99 - ETA: 18s - loss: 0.0855 - acc:
0.9681 - auc_roc: 0.99 - ETA: 17s - loss: 0.0853 - acc: 0.9681 - auc_roc: 0.99 -
ETA: 16s - loss: 0.0851 - acc: 0.9682 - auc_roc: 0.99 - ETA: 16s - loss: 0.0853
- acc: 0.9681 - auc_roc: 0.99 - ETA: 15s - loss: 0.0856 - acc: 0.9679 - auc_roc:
0.99 - ETA: 14s - loss: 0.0860 - acc: 0.9677 - auc_roc: 0.99 - ETA: 14s - loss:
0.0858 - acc: 0.9678 - auc_roc: 0.99 - ETA: 13s - loss: 0.0859 - acc: 0.9678 -
auc_roc: 0.99 - ETA: 12s - loss: 0.0860 - acc: 0.9676 - auc_roc: 0.99 - ETA: 12s
- loss: 0.0859 - acc: 0.9678 - auc_roc: 0.99 - ETA: 11s - loss: 0.0857 - acc:
0.9679 - auc_roc: 0.99 - ETA: 10s - loss: 0.0860 - acc: 0.9678 - auc_roc: 0.99 -
ETA: 10s - loss: 0.0861 - acc: 0.9677 - auc_roc: 0.99 - ETA: 9s - loss: 0.0862 -
acc: 0.9676 - auc_roc: 0.9904 - ETA: 8s - loss: 0.0864 - acc: 0.9676 - auc_roc:
0.990 - ETA: 8s - loss: 0.0865 - acc: 0.9676 - auc_roc: 0.990 - ETA: 7s - loss:
0.0864 - acc: 0.9676 - auc_roc: 0.990 - ETA: 6s - loss: 0.0867 - acc: 0.9674 -
auc_roc: 0.990 - ETA: 6s - loss: 0.0866 - acc: 0.9674 - auc_roc: 0.990 - ETA: 5s
- loss: 0.0865 - acc: 0.9674 - auc_roc: 0.990 - ETA: 4s - loss: 0.0865 - acc:
0.9675 - auc_roc: 0.990 - ETA: 4s - loss: 0.0871 - acc: 0.9674 - auc_roc: 0.990
- ETA: 3s - loss: 0.0872 - acc: 0.9673 - auc_roc: 0.990 - ETA: 2s - loss: 0.0873
- acc: 0.9673 - auc_roc: 0.990 - ETA: 2s - loss: 0.0875 - acc: 0.9672 - auc_roc:
0.989 - ETA: 1s - loss: 0.0875 - acc: 0.9671 - auc_roc: 0.990 - ETA: 0s - loss:
0.0875 - acc: 0.9670 - auc_roc: 0.989 - ETA: 0s - loss: 0.0871 - acc: 0.9673 -
auc_roc: 0.990 - 51s 725us/step - loss: 0.0872 - acc: 0.9672 - auc_roc: 0.9900 -
val_loss: 1.0428 - val_acc: 0.8040 - val_auc_roc: 0.6474

Epoch 00038: val_auc_roc did not improve from 0.75507
Epoch 39/50
```

```
69918/69918 [==============================] - ETA: 45s - loss: 0.0677 - acc:
0.9756 - auc_roc: 0.99 - ETA: 44s - loss: 0.0674 - acc: 0.9756 - auc_roc: 0.99 -
ETA: 44s - loss: 0.0718 - acc: 0.9714 - auc_roc: 0.99 - ETA: 43s - loss: 0.0719
- acc: 0.9702 - auc_roc: 0.99 - ETA: 42s - loss: 0.0741 - acc: 0.9705 - auc_roc:
0.99 - ETA: 42s - loss: 0.0760 - acc: 0.9697 - auc_roc: 0.99 - ETA: 40s - loss:
0.0773 - acc: 0.9686 - auc_roc: 0.99 - ETA: 40s - loss: 0.0772 - acc: 0.9690 -
auc_roc: 0.99 - ETA: 39s - loss: 0.0778 - acc: 0.9688 - auc_roc: 0.99 - ETA: 38s
- loss: 0.0762 - acc: 0.9694 - auc_roc: 0.99 - ETA: 38s - loss: 0.0760 - acc:
0.9695 - auc_roc: 0.99 - ETA: 37s - loss: 0.0761 - acc: 0.9693 - auc_roc: 0.99 -
ETA: 36s - loss: 0.0758 - acc: 0.9695 - auc_roc: 0.99 - ETA: 36s - loss: 0.0758
- acc: 0.9694 - auc_roc: 0.99 - ETA: 35s - loss: 0.0750 - acc: 0.9697 - auc_roc:
0.99 - ETA: 35s - loss: 0.0755 - acc: 0.9695 - auc_roc: 0.99 - ETA: 34s - loss:
0.0759 - acc: 0.9696 - auc_roc: 0.99 - ETA: 33s - loss: 0.0749 - acc: 0.9703 -
auc_roc: 0.99 - ETA: 33s - loss: 0.0751 - acc: 0.9703 - auc_roc: 0.99 - ETA: 32s
- loss: 0.0757 - acc: 0.9704 - auc_roc: 0.99 - ETA: 31s - loss: 0.0761 - acc:
0.9704 - auc_roc: 0.99 - ETA: 30s - loss: 0.0773 - acc: 0.9703 - auc_roc: 0.99 -
ETA: 30s - loss: 0.0772 - acc: 0.9703 - auc_roc: 0.99 - ETA: 29s - loss: 0.0768
- acc: 0.9704 - auc_roc: 0.99 - ETA: 28s - loss: 0.0775 - acc: 0.9702 - auc_roc:
0.99 - ETA: 28s - loss: 0.0770 - acc: 0.9704 - auc_roc: 0.99 - ETA: 27s - loss:
0.0767 - acc: 0.9704 - auc_roc: 0.99 - ETA: 26s - loss: 0.0775 - acc: 0.9699 -
auc_roc: 0.99 - ETA: 26s - loss: 0.0771 - acc: 0.9702 - auc_roc: 0.99 - ETA: 25s
- loss: 0.0778 - acc: 0.9698 - auc_roc: 0.99 - ETA: 24s - loss: 0.0781 - acc:
0.9698 - auc_roc: 0.99 - ETA: 24s - loss: 0.0782 - acc: 0.9696 - auc_roc: 0.99 -
ETA: 23s - loss: 0.0780 - acc: 0.9697 - auc_roc: 0.99 - ETA: 22s - loss: 0.0782
- acc: 0.9695 - auc_roc: 0.99 - ETA: 22s - loss: 0.0783 - acc: 0.9697 - auc_roc:
0.99 - ETA: 21s - loss: 0.0784 - acc: 0.9696 - auc_roc: 0.99 - ETA: 20s - loss:
0.0786 - acc: 0.9696 - auc_roc: 0.99 - ETA: 20s - loss: 0.0786 - acc: 0.9696 -
auc_roc: 0.99 - ETA: 19s - loss: 0.0790 - acc: 0.9693 - auc_roc: 0.99 - ETA: 18s
- loss: 0.0789 - acc: 0.9692 - auc_roc: 0.99 - ETA: 18s - loss: 0.0789 - acc:
0.9693 - auc_roc: 0.99 - ETA: 17s - loss: 0.0787 - acc: 0.9692 - auc_roc: 0.99 -
ETA: 16s - loss: 0.0787 - acc: 0.9693 - auc_roc: 0.99 - ETA: 16s - loss: 0.0794
- acc: 0.9692 - auc_roc: 0.99 - ETA: 15s - loss: 0.0792 - acc: 0.9692 - auc_roc:
0.99 - ETA: 14s - loss: 0.0789 - acc: 0.9695 - auc_roc: 0.99 - ETA: 14s - loss:
0.0785 - acc: 0.9697 - auc_roc: 0.99 - ETA: 13s - loss: 0.0786 - acc: 0.9696 -
auc_roc: 0.99 - ETA: 12s - loss: 0.0789 - acc: 0.9694 - auc_roc: 0.99 - ETA: 12s
- loss: 0.0788 - acc: 0.9695 - auc_roc: 0.99 - ETA: 11s - loss: 0.0787 - acc:
0.9696 - auc_roc: 0.99 - ETA: 10s - loss: 0.0789 - acc: 0.9694 - auc_roc: 0.99 -
ETA: 10s - loss: 0.0791 - acc: 0.9693 - auc_roc: 0.99 - ETA: 9s - loss: 0.0790 -
acc: 0.9694 - auc_roc: 0.9922 - ETA: 8s - loss: 0.0792 - acc: 0.9694 - auc_roc:
0.992 - ETA: 8s - loss: 0.0793 - acc: 0.9694 - auc_roc: 0.992 - ETA: 7s - loss:
0.0796 - acc: 0.9694 - auc_roc: 0.992 - ETA: 6s - loss: 0.0798 - acc: 0.9693 -
auc_roc: 0.992 - ETA: 6s - loss: 0.0797 - acc: 0.9694 - auc_roc: 0.992 - ETA: 5s
- loss: 0.0799 - acc: 0.9694 - auc_roc: 0.992 - ETA: 4s - loss: 0.0801 - acc:
0.9693 - auc_roc: 0.991 - ETA: 4s - loss: 0.0801 - acc: 0.9692 - auc_roc: 0.991
- ETA: 3s - loss: 0.0803 - acc: 0.9692 - auc_roc: 0.991 - ETA: 2s - loss: 0.0805
- acc: 0.9692 - auc_roc: 0.991 - ETA: 2s - loss: 0.0804 - acc: 0.9692 - auc_roc:
0.991 - ETA: 1s - loss: 0.0803 - acc: 0.9693 - auc_roc: 0.991 - ETA: 0s - loss:
0.0802 - acc: 0.9693 - auc_roc: 0.991 - ETA: 0s - loss: 0.0801 - acc: 0.9694 -
```

```
auc_roc: 0.991 - 51s 728us/step - loss: 0.0800 - acc: 0.9694 - auc_roc: 0.9918 -
val_loss: 1.0472 - val_acc: 0.8136 - val_auc_roc: 0.6461

Epoch 00039: val_auc_roc did not improve from 0.75507
Epoch 40/50
69918/69918 [==============================] - ETA: 42s - loss: 0.0685 - acc:
0.9785 - auc_roc: 0.99 - ETA: 42s - loss: 0.0651 - acc: 0.9761 - auc_roc: 0.99 -
ETA: 41s - loss: 0.0680 - acc: 0.9746 - auc_roc: 0.99 - ETA: 40s - loss: 0.0689
- acc: 0.9736 - auc_roc: 0.99 - ETA: 40s - loss: 0.0705 - acc: 0.9734 - auc_roc:
0.99 - ETA: 40s - loss: 0.0704 - acc: 0.9730 - auc_roc: 0.99 - ETA: 39s - loss:
0.0703 - acc: 0.9727 - auc_roc: 0.99 - ETA: 38s - loss: 0.0700 - acc: 0.9731 -
auc_roc: 0.99 - ETA: 38s - loss: 0.0682 - acc: 0.9736 - auc_roc: 0.99 - ETA: 37s
- loss: 0.0680 - acc: 0.9738 - auc_roc: 0.99 - ETA: 37s - loss: 0.0661 - acc:
0.9747 - auc_roc: 0.99 - ETA: 36s - loss: 0.0663 - acc: 0.9744 - auc_roc: 0.99 -
ETA: 35s - loss: 0.0649 - acc: 0.9747 - auc_roc: 0.99 - ETA: 35s - loss: 0.0641
- acc: 0.9752 - auc_roc: 0.99 - ETA: 34s - loss: 0.0649 - acc: 0.9749 - auc_roc:
0.99 - ETA: 34s - loss: 0.0634 - acc: 0.9755 - auc_roc: 0.99 - ETA: 33s - loss:
0.0629 - acc: 0.9758 - auc_roc: 0.99 - ETA: 33s - loss: 0.0625 - acc: 0.9762 -
auc_roc: 0.99 - ETA: 32s - loss: 0.0616 - acc: 0.9766 - auc_roc: 0.99 - ETA: 31s
- loss: 0.0623 - acc: 0.9763 - auc_roc: 0.99 - ETA: 30s - loss: 0.0620 - acc:
0.9765 - auc_roc: 0.99 - ETA: 30s - loss: 0.0622 - acc: 0.9764 - auc_roc: 0.99 -
ETA: 29s - loss: 0.0621 - acc: 0.9766 - auc_roc: 0.99 - ETA: 29s - loss: 0.0621
- acc: 0.9765 - auc_roc: 0.99 - ETA: 28s - loss: 0.0619 - acc: 0.9767 - auc_roc:
0.99 - ETA: 27s - loss: 0.0617 - acc: 0.9767 - auc_roc: 0.99 - ETA: 27s - loss:
0.0617 - acc: 0.9767 - auc_roc: 0.99 - ETA: 26s - loss: 0.0617 - acc: 0.9766 -
auc_roc: 0.99 - ETA: 25s - loss: 0.0617 - acc: 0.9765 - auc_roc: 0.99 - ETA: 25s
- loss: 0.0617 - acc: 0.9764 - auc_roc: 0.99 - ETA: 24s - loss: 0.0615 - acc:
0.9766 - auc_roc: 0.99 - ETA: 23s - loss: 0.0615 - acc: 0.9766 - auc_roc: 0.99 -
ETA: 23s - loss: 0.0622 - acc: 0.9764 - auc_roc: 0.99 - ETA: 22s - loss: 0.0621
- acc: 0.9764 - auc_roc: 0.99 - ETA: 21s - loss: 0.0625 - acc: 0.9764 - auc_roc:
0.99 - ETA: 21s - loss: 0.0623 - acc: 0.9764 - auc_roc: 0.99 - ETA: 20s - loss:
0.0624 - acc: 0.9763 - auc_roc: 0.99 - ETA: 19s - loss: 0.0628 - acc: 0.9763 -
auc_roc: 0.99 - ETA: 19s - loss: 0.0629 - acc: 0.9763 - auc_roc: 0.99 - ETA: 18s
- loss: 0.0631 - acc: 0.9762 - auc_roc: 0.99 - ETA: 17s - loss: 0.0630 - acc:
0.9762 - auc_roc: 0.99 - ETA: 17s - loss: 0.0631 - acc: 0.9761 - auc_roc: 0.99 -
ETA: 16s - loss: 0.0635 - acc: 0.9760 - auc_roc: 0.99 - ETA: 15s - loss: 0.0636
- acc: 0.9759 - auc_roc: 0.99 - ETA: 15s - loss: 0.0635 - acc: 0.9760 - auc_roc:
0.99 - ETA: 14s - loss: 0.0637 - acc: 0.9759 - auc_roc: 0.99 - ETA: 14s - loss:
0.0642 - acc: 0.9758 - auc_roc: 0.99 - ETA: 13s - loss: 0.0642 - acc: 0.9759 -
auc_roc: 0.99 - ETA: 12s - loss: 0.0646 - acc: 0.9758 - auc_roc: 0.99 - ETA: 12s
- loss: 0.0643 - acc: 0.9759 - auc_roc: 0.99 - ETA: 11s - loss: 0.0647 - acc:
0.9758 - auc_roc: 0.99 - ETA: 10s - loss: 0.0651 - acc: 0.9755 - auc_roc: 0.99 -
ETA: 10s - loss: 0.0650 - acc: 0.9755 - auc_roc: 0.99 - ETA: 9s - loss: 0.0654 -
acc: 0.9754 - auc_roc: 0.9944 - ETA: 8s - loss: 0.0655 - acc: 0.9754 - auc_roc:
0.994 - ETA: 8s - loss: 0.0655 - acc: 0.9755 - auc_roc: 0.994 - ETA: 7s - loss:
0.0657 - acc: 0.9754 - auc_roc: 0.994 - ETA: 6s - loss: 0.0664 - acc: 0.9751 -
auc_roc: 0.994 - ETA: 6s - loss: 0.0666 - acc: 0.9750 - auc_roc: 0.994 - ETA: 5s
- loss: 0.0669 - acc: 0.9749 - auc_roc: 0.994 - ETA: 4s - loss: 0.0668 - acc:
```

```
0.9749 - auc_roc: 0.994 - ETA: 4s - loss: 0.0669 - acc: 0.9748 - auc_roc: 0.994
- ETA: 3s - loss: 0.0670 - acc: 0.9747 - auc_roc: 0.994 - ETA: 2s - loss: 0.0672
- acc: 0.9747 - auc_roc: 0.994 - ETA: 2s - loss: 0.0675 - acc: 0.9746 - auc_roc:
0.994 - ETA: 1s - loss: 0.0676 - acc: 0.9747 - auc_roc: 0.994 - ETA: 0s - loss:
0.0676 - acc: 0.9745 - auc_roc: 0.994 - ETA: 0s - loss: 0.0677 - acc: 0.9745 -
auc_roc: 0.994 - 50s 720us/step - loss: 0.0676 - acc: 0.9746 - auc_roc: 0.9940 -
val_loss: 1.1563 - val_acc: 0.8208 - val_auc_roc: 0.6465

Epoch 00040: val_auc_roc did not improve from 0.75507
Epoch 41/50
69918/69918 [==============================] - ETA: 43s - loss: 0.0594 - acc:
0.9766 - auc_roc: 0.99 - ETA: 44s - loss: 0.0569 - acc: 0.9771 - auc_roc: 0.99 -
ETA: 43s - loss: 0.0607 - acc: 0.9759 - auc_roc: 0.99 - ETA: 42s - loss: 0.0620
- acc: 0.9761 - auc_roc: 0.99 - ETA: 41s - loss: 0.0646 - acc: 0.9750 - auc_roc:
0.99 - ETA: 41s - loss: 0.0645 - acc: 0.9754 - auc_roc: 0.99 - ETA: 41s - loss:
0.0656 - acc: 0.9749 - auc_roc: 0.99 - ETA: 40s - loss: 0.0643 - acc: 0.9756 -
auc_roc: 0.99 - ETA: 39s - loss: 0.0649 - acc: 0.9750 - auc_roc: 0.99 - ETA: 38s
- loss: 0.0633 - acc: 0.9756 - auc_roc: 0.99 - ETA: 38s - loss: 0.0646 - acc:
0.9750 - auc_roc: 0.99 - ETA: 37s - loss: 0.0658 - acc: 0.9748 - auc_roc: 0.99 -
ETA: 36s - loss: 0.0657 - acc: 0.9748 - auc_roc: 0.99 - ETA: 36s - loss: 0.0652
- acc: 0.9750 - auc_roc: 0.99 - ETA: 35s - loss: 0.0667 - acc: 0.9747 - auc_roc:
0.99 - ETA: 34s - loss: 0.0672 - acc: 0.9747 - auc_roc: 0.99 - ETA: 34s - loss:
0.0677 - acc: 0.9745 - auc_roc: 0.99 - ETA: 33s - loss: 0.0684 - acc: 0.9740 -
auc_roc: 0.99 - ETA: 32s - loss: 0.0688 - acc: 0.9739 - auc_roc: 0.99 - ETA: 32s
- loss: 0.0689 - acc: 0.9739 - auc_roc: 0.99 - ETA: 31s - loss: 0.0698 - acc:
0.9739 - auc_roc: 0.99 - ETA: 30s - loss: 0.0704 - acc: 0.9735 - auc_roc: 0.99 -
ETA: 30s - loss: 0.0703 - acc: 0.9735 - auc_roc: 0.99 - ETA: 29s - loss: 0.0704
- acc: 0.9736 - auc_roc: 0.99 - ETA: 28s - loss: 0.0715 - acc: 0.9732 - auc_roc:
0.99 - ETA: 28s - loss: 0.0706 - acc: 0.9734 - auc_roc: 0.99 - ETA: 27s - loss:
0.0708 - acc: 0.9736 - auc_roc: 0.99 - ETA: 26s - loss: 0.0714 - acc: 0.9733 -
auc_roc: 0.99 - ETA: 26s - loss: 0.0713 - acc: 0.9731 - auc_roc: 0.99 - ETA: 25s
- loss: 0.0715 - acc: 0.9731 - auc_roc: 0.99 - ETA: 24s - loss: 0.0720 - acc:
0.9728 - auc_roc: 0.99 - ETA: 24s - loss: 0.0722 - acc: 0.9727 - auc_roc: 0.99 -
ETA: 23s - loss: 0.0727 - acc: 0.9722 - auc_roc: 0.99 - ETA: 22s - loss: 0.0730
- acc: 0.9721 - auc_roc: 0.99 - ETA: 22s - loss: 0.0735 - acc: 0.9722 - auc_roc:
0.99 - ETA: 21s - loss: 0.0744 - acc: 0.9719 - auc_roc: 0.99 - ETA: 20s - loss:
0.0742 - acc: 0.9720 - auc_roc: 0.99 - ETA: 20s - loss: 0.0742 - acc: 0.9721 -
auc_roc: 0.99 - ETA: 19s - loss: 0.0742 - acc: 0.9720 - auc_roc: 0.99 - ETA: 18s
- loss: 0.0738 - acc: 0.9721 - auc_roc: 0.99 - ETA: 18s - loss: 0.0736 - acc:
0.9721 - auc_roc: 0.99 - ETA: 17s - loss: 0.0735 - acc: 0.9723 - auc_roc: 0.99 -
ETA: 16s - loss: 0.0735 - acc: 0.9722 - auc_roc: 0.99 - ETA: 16s - loss: 0.0738
- acc: 0.9719 - auc_roc: 0.99 - ETA: 15s - loss: 0.0739 - acc: 0.9720 - auc_roc:
0.99 - ETA: 14s - loss: 0.0744 - acc: 0.9718 - auc_roc: 0.99 - ETA: 14s - loss:
0.0743 - acc: 0.9718 - auc_roc: 0.99 - ETA: 13s - loss: 0.0739 - acc: 0.9719 -
auc_roc: 0.99 - ETA: 12s - loss: 0.0736 - acc: 0.9720 - auc_roc: 0.99 - ETA: 12s
- loss: 0.0743 - acc: 0.9717 - auc_roc: 0.99 - ETA: 11s - loss: 0.0743 - acc:
0.9718 - auc_roc: 0.99 - ETA: 10s - loss: 0.0742 - acc: 0.9718 - auc_roc: 0.99 -
ETA: 10s - loss: 0.0742 - acc: 0.9717 - auc_roc: 0.99 - ETA: 9s - loss: 0.0744 -
```

```
acc: 0.9716 - auc_roc: 0.9929 - ETA: 8s - loss: 0.0743 - acc: 0.9717 - auc_roc:
0.993 - ETA: 8s - loss: 0.0744 - acc: 0.9716 - auc_roc: 0.993 - ETA: 7s - loss:
0.0745 - acc: 0.9716 - auc_roc: 0.992 - ETA: 6s - loss: 0.0747 - acc: 0.9714 -
auc_roc: 0.992 - ETA: 6s - loss: 0.0750 - acc: 0.9714 - auc_roc: 0.992 - ETA: 5s
- loss: 0.0748 - acc: 0.9715 - auc_roc: 0.992 - ETA: 4s - loss: 0.0747 - acc:
0.9716 - auc_roc: 0.992 - ETA: 4s - loss: 0.0747 - acc: 0.9716 - auc_roc: 0.992
- ETA: 3s - loss: 0.0745 - acc: 0.9717 - auc_roc: 0.992 - ETA: 2s - loss: 0.0744
- acc: 0.9716 - auc_roc: 0.992 - ETA: 2s - loss: 0.0746 - acc: 0.9716 - auc_roc:
0.992 - ETA: 1s - loss: 0.0745 - acc: 0.9717 - auc_roc: 0.992 - ETA: 0s - loss:
0.0747 - acc: 0.9717 - auc_roc: 0.992 - ETA: 0s - loss: 0.0745 - acc: 0.9717 -
auc_roc: 0.992 - 51s 732us/step - loss: 0.0746 - acc: 0.9717 - auc_roc: 0.9928 -
val_loss: 1.1290 - val_acc: 0.8215 - val_auc_roc: 0.6471

Epoch 00041: val_auc_roc did not improve from 0.75507
Epoch 42/50
69918/69918 [==============================] - ETA: 44s - loss: 0.0593 - acc:
0.9785 - auc_roc: 0.99 - ETA: 44s - loss: 0.0604 - acc: 0.9746 - auc_roc: 0.99 -
ETA: 43s - loss: 0.0635 - acc: 0.9746 - auc_roc: 0.99 - ETA: 42s - loss: 0.0655
- acc: 0.9758 - auc_roc: 0.99 - ETA: 42s - loss: 0.0681 - acc: 0.9746 - auc_roc:
0.99 - ETA: 41s - loss: 0.0678 - acc: 0.9753 - auc_roc: 0.99 - ETA: 41s - loss:
0.0695 - acc: 0.9742 - auc_roc: 0.99 - ETA: 40s - loss: 0.0676 - acc: 0.9752 -
auc_roc: 0.99 - ETA: 39s - loss: 0.0658 - acc: 0.9759 - auc_roc: 0.99 - ETA: 38s
- loss: 0.0660 - acc: 0.9754 - auc_roc: 0.99 - ETA: 38s - loss: 0.0669 - acc:
0.9745 - auc_roc: 0.99 - ETA: 37s - loss: 0.0667 - acc: 0.9749 - auc_roc: 0.99 -
ETA: 36s - loss: 0.0655 - acc: 0.9752 - auc_roc: 0.99 - ETA: 35s - loss: 0.0652
- acc: 0.9753 - auc_roc: 0.99 - ETA: 35s - loss: 0.0645 - acc: 0.9757 - auc_roc:
0.99 - ETA: 34s - loss: 0.0650 - acc: 0.9753 - auc_roc: 0.99 - ETA: 33s - loss:
0.0651 - acc: 0.9754 - auc_roc: 0.99 - ETA: 33s - loss: 0.0650 - acc: 0.9752 -
auc_roc: 0.99 - ETA: 32s - loss: 0.0656 - acc: 0.9749 - auc_roc: 0.99 - ETA: 31s
- loss: 0.0655 - acc: 0.9749 - auc_roc: 0.99 - ETA: 31s - loss: 0.0650 - acc:
0.9751 - auc_roc: 0.99 - ETA: 30s - loss: 0.0647 - acc: 0.9752 - auc_roc: 0.99 -
ETA: 29s - loss: 0.0640 - acc: 0.9755 - auc_roc: 0.99 - ETA: 29s - loss: 0.0640
- acc: 0.9754 - auc_roc: 0.99 - ETA: 28s - loss: 0.0636 - acc: 0.9755 - auc_roc:
0.99 - ETA: 27s - loss: 0.0633 - acc: 0.9758 - auc_roc: 0.99 - ETA: 27s - loss:
0.0638 - acc: 0.9755 - auc_roc: 0.99 - ETA: 26s - loss: 0.0635 - acc: 0.9756 -
auc_roc: 0.99 - ETA: 25s - loss: 0.0632 - acc: 0.9757 - auc_roc: 0.99 - ETA: 25s
- loss: 0.0633 - acc: 0.9757 - auc_roc: 0.99 - ETA: 24s - loss: 0.0638 - acc:
0.9756 - auc_roc: 0.99 - ETA: 23s - loss: 0.0634 - acc: 0.9758 - auc_roc: 0.99 -
ETA: 23s - loss: 0.0633 - acc: 0.9760 - auc_roc: 0.99 - ETA: 22s - loss: 0.0636
- acc: 0.9761 - auc_roc: 0.99 - ETA: 21s - loss: 0.0640 - acc: 0.9759 - auc_roc:
0.99 - ETA: 21s - loss: 0.0638 - acc: 0.9762 - auc_roc: 0.99 - ETA: 20s - loss:
0.0636 - acc: 0.9763 - auc_roc: 0.99 - ETA: 19s - loss: 0.0633 - acc: 0.9765 -
auc_roc: 0.99 - ETA: 19s - loss: 0.0629 - acc: 0.9767 - auc_roc: 0.99 - ETA: 18s
- loss: 0.0631 - acc: 0.9767 - auc_roc: 0.99 - ETA: 18s - loss: 0.0633 - acc:
0.9765 - auc_roc: 0.99 - ETA: 17s - loss: 0.0630 - acc: 0.9766 - auc_roc: 0.99 -
ETA: 16s - loss: 0.0627 - acc: 0.9766 - auc_roc: 0.99 - ETA: 16s - loss: 0.0631
- acc: 0.9764 - auc_roc: 0.99 - ETA: 15s - loss: 0.0634 - acc: 0.9762 - auc_roc:
0.99 - ETA: 14s - loss: 0.0637 - acc: 0.9761 - auc_roc: 0.99 - ETA: 14s - loss:
```

```
0.0638 - acc: 0.9758 - auc_roc: 0.99 - ETA: 13s - loss: 0.0638 - acc: 0.9758 -
auc_roc: 0.99 - ETA: 12s - loss: 0.0639 - acc: 0.9757 - auc_roc: 0.99 - ETA: 12s
- loss: 0.0638 - acc: 0.9757 - auc_roc: 0.99 - ETA: 11s - loss: 0.0637 - acc:
0.9757 - auc_roc: 0.99 - ETA: 10s - loss: 0.0646 - acc: 0.9753 - auc_roc: 0.99 -
ETA: 10s - loss: 0.0646 - acc: 0.9753 - auc_roc: 0.99 - ETA: 9s - loss: 0.0644 -
acc: 0.9754 - auc_roc: 0.9946 - ETA: 8s - loss: 0.0645 - acc: 0.9753 - auc_roc:
0.994 - ETA: 8s - loss: 0.0648 - acc: 0.9752 - auc_roc: 0.994 - ETA: 7s - loss:
0.0649 - acc: 0.9752 - auc_roc: 0.994 - ETA: 6s - loss: 0.0645 - acc: 0.9754 -
auc_roc: 0.994 - ETA: 6s - loss: 0.0646 - acc: 0.9754 - auc_roc: 0.994 - ETA: 5s
- loss: 0.0650 - acc: 0.9751 - auc_roc: 0.994 - ETA: 4s - loss: 0.0651 - acc:
0.9751 - auc_roc: 0.994 - ETA: 4s - loss: 0.0650 - acc: 0.9752 - auc_roc: 0.994
- ETA: 3s - loss: 0.0651 - acc: 0.9752 - auc_roc: 0.994 - ETA: 2s - loss: 0.0654
- acc: 0.9750 - auc_roc: 0.994 - ETA: 2s - loss: 0.0658 - acc: 0.9748 - auc_roc:
0.994 - ETA: 1s - loss: 0.0659 - acc: 0.9748 - auc_roc: 0.994 - ETA: 0s - loss:
0.0661 - acc: 0.9747 - auc_roc: 0.994 - ETA: 0s - loss: 0.0663 - acc: 0.9746 -
auc_roc: 0.994 - 51s 727us/step - loss: 0.0662 - acc: 0.9746 - auc_roc: 0.9944 -
val_loss: 1.1301 - val_acc: 0.8106 - val_auc_roc: 0.6445

Epoch 00042: val_auc_roc did not improve from 0.75507
Epoch 43/50
69918/69918 [==============================] - ETA: 44s - loss: 0.0605 - acc:
0.9746 - auc_roc: 0.99 - ETA: 44s - loss: 0.0568 - acc: 0.9780 - auc_roc: 0.99 -
ETA: 43s - loss: 0.0546 - acc: 0.9792 - auc_roc: 0.99 - ETA: 42s - loss: 0.0559
- acc: 0.9785 - auc_roc: 0.99 - ETA: 42s - loss: 0.0586 - acc: 0.9775 - auc_roc:
0.99 - ETA: 41s - loss: 0.0586 - acc: 0.9780 - auc_roc: 0.99 - ETA: 40s - loss:
0.0578 - acc: 0.9782 - auc_roc: 0.99 - ETA: 39s - loss: 0.0565 - acc: 0.9784 -
auc_roc: 0.99 - ETA: 39s - loss: 0.0579 - acc: 0.9784 - auc_roc: 0.99 - ETA: 38s
- loss: 0.0583 - acc: 0.9782 - auc_roc: 0.99 - ETA: 38s - loss: 0.0574 - acc:
0.9790 - auc_roc: 0.99 - ETA: 37s - loss: 0.0575 - acc: 0.9789 - auc_roc: 0.99 -
ETA: 36s - loss: 0.0573 - acc: 0.9794 - auc_roc: 0.99 - ETA: 35s - loss: 0.0569
- acc: 0.9793 - auc_roc: 0.99 - ETA: 35s - loss: 0.0563 - acc: 0.9794 - auc_roc:
0.99 - ETA: 34s - loss: 0.0571 - acc: 0.9791 - auc_roc: 0.99 - ETA: 34s - loss:
0.0562 - acc: 0.9795 - auc_roc: 0.99 - ETA: 33s - loss: 0.0556 - acc: 0.9795 -
auc_roc: 0.99 - ETA: 32s - loss: 0.0550 - acc: 0.9799 - auc_roc: 0.99 - ETA: 31s
- loss: 0.0546 - acc: 0.9799 - auc_roc: 0.99 - ETA: 31s - loss: 0.0553 - acc:
0.9799 - auc_roc: 0.99 - ETA: 30s - loss: 0.0558 - acc: 0.9797 - auc_roc: 0.99 -
ETA: 29s - loss: 0.0561 - acc: 0.9796 - auc_roc: 0.99 - ETA: 29s - loss: 0.0564
- acc: 0.9794 - auc_roc: 0.99 - ETA: 28s - loss: 0.0565 - acc: 0.9794 - auc_roc:
0.99 - ETA: 27s - loss: 0.0571 - acc: 0.9790 - auc_roc: 0.99 - ETA: 27s - loss:
0.0575 - acc: 0.9789 - auc_roc: 0.99 - ETA: 26s - loss: 0.0577 - acc: 0.9789 -
auc_roc: 0.99 - ETA: 26s - loss: 0.0577 - acc: 0.9791 - auc_roc: 0.99 - ETA: 25s
- loss: 0.0576 - acc: 0.9791 - auc_roc: 0.99 - ETA: 24s - loss: 0.0574 - acc:
0.9791 - auc_roc: 0.99 - ETA: 24s - loss: 0.0573 - acc: 0.9791 - auc_roc: 0.99 -
ETA: 23s - loss: 0.0571 - acc: 0.9791 - auc_roc: 0.99 - ETA: 22s - loss: 0.0575
- acc: 0.9789 - auc_roc: 0.99 - ETA: 22s - loss: 0.0582 - acc: 0.9785 - auc_roc:
0.99 - ETA: 21s - loss: 0.0582 - acc: 0.9784 - auc_roc: 0.99 - ETA: 20s - loss:
0.0586 - acc: 0.9782 - auc_roc: 0.99 - ETA: 20s - loss: 0.0587 - acc: 0.9782 -
auc_roc: 0.99 - ETA: 19s - loss: 0.0587 - acc: 0.9781 - auc_roc: 0.99 - ETA: 18s
```

- loss: 0.0589 - acc: 0.9781 - auc_roc: 0.99 - ETA: 18s - loss: 0.0592 - acc:
0.9781 - auc_roc: 0.99 - ETA: 17s - loss: 0.0592 - acc: 0.9780 - auc_roc: 0.99 -
ETA: 16s - loss: 0.0594 - acc: 0.9779 - auc_roc: 0.99 - ETA: 16s - loss: 0.0596
- acc: 0.9778 - auc_roc: 0.99 - ETA: 15s - loss: 0.0597 - acc: 0.9779 - auc_roc:
0.99 - ETA: 14s - loss: 0.0601 - acc: 0.9778 - auc_roc: 0.99 - ETA: 14s - loss:
0.0603 - acc: 0.9778 - auc_roc: 0.99 - ETA: 13s - loss: 0.0603 - acc: 0.9778 -
auc_roc: 0.99 - ETA: 12s - loss: 0.0607 - acc: 0.9778 - auc_roc: 0.99 - ETA: 12s
- loss: 0.0605 - acc: 0.9778 - auc_roc: 0.99 - ETA: 11s - loss: 0.0603 - acc:
0.9778 - auc_roc: 0.99 - ETA: 10s - loss: 0.0601 - acc: 0.9778 - auc_roc: 0.99 -
ETA: 10s - loss: 0.0601 - acc: 0.9778 - auc_roc: 0.99 - ETA: 9s - loss: 0.0600 -
acc: 0.9779 - auc_roc: 0.9951 - ETA: 8s - loss: 0.0600 - acc: 0.9778 - auc_roc:
0.995 - ETA: 8s - loss: 0.0600 - acc: 0.9778 - auc_roc: 0.995 - ETA: 7s - loss:
0.0600 - acc: 0.9778 - auc_roc: 0.995 - ETA: 6s - loss: 0.0599 - acc: 0.9779 -
auc_roc: 0.995 - ETA: 6s - loss: 0.0599 - acc: 0.9779 - auc_roc: 0.995 - ETA: 5s
- loss: 0.0598 - acc: 0.9779 - auc_roc: 0.995 - ETA: 4s - loss: 0.0598 - acc:
0.9778 - auc_roc: 0.995 - ETA: 4s - loss: 0.0599 - acc: 0.9779 - auc_roc: 0.995
- ETA: 3s - loss: 0.0599 - acc: 0.9779 - auc_roc: 0.995 - ETA: 2s - loss: 0.0599
- acc: 0.9778 - auc_roc: 0.995 - ETA: 2s - loss: 0.0600 - acc: 0.9777 - auc_roc:
0.995 - ETA: 1s - loss: 0.0601 - acc: 0.9776 - auc_roc: 0.995 - ETA: 0s - loss:
0.0605 - acc: 0.9776 - auc_roc: 0.995 - ETA: 0s - loss: 0.0605 - acc: 0.9776 -
auc_roc: 0.995 - 50s 721us/step - loss: 0.0605 - acc: 0.9776 - auc_roc: 0.9950 -
val_loss: 1.2248 - val_acc: 0.8116 - val_auc_roc: 0.6536

Epoch 00043: val_auc_roc did not improve from 0.75507
Epoch 44/50
69918/69918 [==============================] - ETA: 44s - loss: 0.0523 - acc:
0.9814 - auc_roc: 0.99 - ETA: 43s - loss: 0.0505 - acc: 0.9800 - auc_roc: 0.99 -
ETA: 42s - loss: 0.0503 - acc: 0.9808 - auc_roc: 0.99 - ETA: 41s - loss: 0.0520
- acc: 0.9810 - auc_roc: 0.99 - ETA: 41s - loss: 0.0539 - acc: 0.9793 - auc_roc:
0.99 - ETA: 40s - loss: 0.0528 - acc: 0.9800 - auc_roc: 0.99 - ETA: 39s - loss:
0.0540 - acc: 0.9799 - auc_roc: 0.99 - ETA: 39s - loss: 0.0553 - acc: 0.9795 -
auc_roc: 0.99 - ETA: 38s - loss: 0.0540 - acc: 0.9799 - auc_roc: 0.99 - ETA: 38s
- loss: 0.0535 - acc: 0.9801 - auc_roc: 0.99 - ETA: 37s - loss: 0.0542 - acc:
0.9801 - auc_roc: 0.99 - ETA: 36s - loss: 0.0535 - acc: 0.9801 - auc_roc: 0.99 -
ETA: 36s - loss: 0.0532 - acc: 0.9805 - auc_roc: 0.99 - ETA: 35s - loss: 0.0531
- acc: 0.9803 - auc_roc: 0.99 - ETA: 35s - loss: 0.0539 - acc: 0.9798 - auc_roc:
0.99 - ETA: 34s - loss: 0.0536 - acc: 0.9800 - auc_roc: 0.99 - ETA: 33s - loss:
0.0536 - acc: 0.9799 - auc_roc: 0.99 - ETA: 33s - loss: 0.0540 - acc: 0.9797 -
auc_roc: 0.99 - ETA: 32s - loss: 0.0535 - acc: 0.9799 - auc_roc: 0.99 - ETA: 31s
- loss: 0.0537 - acc: 0.9798 - auc_roc: 0.99 - ETA: 30s - loss: 0.0537 - acc:
0.9799 - auc_roc: 0.99 - ETA: 30s - loss: 0.0539 - acc: 0.9799 - auc_roc: 0.99 -
ETA: 29s - loss: 0.0537 - acc: 0.9799 - auc_roc: 0.99 - ETA: 29s - loss: 0.0533
- acc: 0.9800 - auc_roc: 0.99 - ETA: 28s - loss: 0.0536 - acc: 0.9799 - auc_roc:
0.99 - ETA: 27s - loss: 0.0539 - acc: 0.9799 - auc_roc: 0.99 - ETA: 27s - loss:
0.0544 - acc: 0.9799 - auc_roc: 0.99 - ETA: 26s - loss: 0.0546 - acc: 0.9798 -
auc_roc: 0.99 - ETA: 25s - loss: 0.0548 - acc: 0.9797 - auc_roc: 0.99 - ETA: 25s
- loss: 0.0551 - acc: 0.9794 - auc_roc: 0.99 - ETA: 24s - loss: 0.0553 - acc:
0.9794 - auc_roc: 0.99 - ETA: 23s - loss: 0.0553 - acc: 0.9793 - auc_roc: 0.99 -

```
ETA: 23s - loss: 0.0555 - acc: 0.9792 - auc_roc: 0.99 - ETA: 22s - loss: 0.0555
- acc: 0.9793 - auc_roc: 0.99 - ETA: 21s - loss: 0.0556 - acc: 0.9794 - auc_roc:
0.99 - ETA: 21s - loss: 0.0561 - acc: 0.9791 - auc_roc: 0.99 - ETA: 20s - loss:
0.0561 - acc: 0.9789 - auc_roc: 0.99 - ETA: 19s - loss: 0.0558 - acc: 0.9790 -
auc_roc: 0.99 - ETA: 19s - loss: 0.0561 - acc: 0.9789 - auc_roc: 0.99 - ETA: 18s
- loss: 0.0562 - acc: 0.9788 - auc_roc: 0.99 - ETA: 17s - loss: 0.0559 - acc:
0.9790 - auc_roc: 0.99 - ETA: 17s - loss: 0.0558 - acc: 0.9790 - auc_roc: 0.99 -
ETA: 16s - loss: 0.0558 - acc: 0.9789 - auc_roc: 0.99 - ETA: 15s - loss: 0.0558
- acc: 0.9789 - auc_roc: 0.99 - ETA: 15s - loss: 0.0556 - acc: 0.9791 - auc_roc:
0.99 - ETA: 14s - loss: 0.0556 - acc: 0.9791 - auc_roc: 0.99 - ETA: 13s - loss:
0.0556 - acc: 0.9790 - auc_roc: 0.99 - ETA: 13s - loss: 0.0558 - acc: 0.9789 -
auc_roc: 0.99 - ETA: 12s - loss: 0.0559 - acc: 0.9789 - auc_roc: 0.99 - ETA: 11s
- loss: 0.0558 - acc: 0.9788 - auc_roc: 0.99 - ETA: 11s - loss: 0.0561 - acc:
0.9787 - auc_roc: 0.99 - ETA: 10s - loss: 0.0564 - acc: 0.9786 - auc_roc: 0.99 -
ETA: 10s - loss: 0.0562 - acc: 0.9787 - auc_roc: 0.99 - ETA: 9s - loss: 0.0564 -
acc: 0.9787 - auc_roc: 0.9959 - ETA: 8s - loss: 0.0568 - acc: 0.9786 - auc_roc:
0.995 - ETA: 8s - loss: 0.0570 - acc: 0.9785 - auc_roc: 0.995 - ETA: 7s - loss:
0.0571 - acc: 0.9784 - auc_roc: 0.995 - ETA: 6s - loss: 0.0572 - acc: 0.9783 -
auc_roc: 0.995 - ETA: 6s - loss: 0.0573 - acc: 0.9782 - auc_roc: 0.995 - ETA: 5s
- loss: 0.0576 - acc: 0.9781 - auc_roc: 0.995 - ETA: 4s - loss: 0.0575 - acc:
0.9781 - auc_roc: 0.995 - ETA: 4s - loss: 0.0576 - acc: 0.9781 - auc_roc: 0.995
- ETA: 3s - loss: 0.0576 - acc: 0.9781 - auc_roc: 0.995 - ETA: 2s - loss: 0.0578
- acc: 0.9780 - auc_roc: 0.995 - ETA: 2s - loss: 0.0579 - acc: 0.9779 - auc_roc:
0.995 - ETA: 1s - loss: 0.0579 - acc: 0.9780 - auc_roc: 0.995 - ETA: 0s - loss:
0.0580 - acc: 0.9779 - auc_roc: 0.995 - ETA: 0s - loss: 0.0580 - acc: 0.9779 -
auc_roc: 0.995 - 51s 723us/step - loss: 0.0580 - acc: 0.9779 - auc_roc: 0.9956 -
val_loss: 1.2460 - val_acc: 0.8119 - val_auc_roc: 0.6569

Epoch 00044: val_auc_roc did not improve from 0.75507
Epoch 45/50
69918/69918 [==============================] - ETA: 44s - loss: 0.0432 - acc:
0.9873 - auc_roc: 0.99 - ETA: 44s - loss: 0.0537 - acc: 0.9829 - auc_roc: 0.99 -
ETA: 43s - loss: 0.0502 - acc: 0.9831 - auc_roc: 0.99 - ETA: 42s - loss: 0.0516
- acc: 0.9817 - auc_roc: 0.99 - ETA: 42s - loss: 0.0517 - acc: 0.9822 - auc_roc:
0.99 - ETA: 41s - loss: 0.0526 - acc: 0.9821 - auc_roc: 0.99 - ETA: 40s - loss:
0.0517 - acc: 0.9819 - auc_roc: 0.99 - ETA: 39s - loss: 0.0522 - acc: 0.9818 -
auc_roc: 0.99 - ETA: 39s - loss: 0.0515 - acc: 0.9821 - auc_roc: 0.99 - ETA: 38s
- loss: 0.0558 - acc: 0.9805 - auc_roc: 0.99 - ETA: 37s - loss: 0.0552 - acc:
0.9806 - auc_roc: 0.99 - ETA: 37s - loss: 0.0554 - acc: 0.9802 - auc_roc: 0.99 -
ETA: 36s - loss: 0.0580 - acc: 0.9792 - auc_roc: 0.99 - ETA: 36s - loss: 0.0584
- acc: 0.9791 - auc_roc: 0.99 - ETA: 35s - loss: 0.0586 - acc: 0.9789 - auc_roc:
0.99 - ETA: 34s - loss: 0.0577 - acc: 0.9791 - auc_roc: 0.99 - ETA: 33s - loss:
0.0569 - acc: 0.9790 - auc_roc: 0.99 - ETA: 33s - loss: 0.0565 - acc: 0.9791 -
auc_roc: 0.99 - ETA: 32s - loss: 0.0559 - acc: 0.9791 - auc_roc: 0.99 - ETA: 32s
- loss: 0.0571 - acc: 0.9784 - auc_roc: 0.99 - ETA: 31s - loss: 0.0573 - acc:
0.9782 - auc_roc: 0.99 - ETA: 30s - loss: 0.0572 - acc: 0.9782 - auc_roc: 0.99 -
ETA: 29s - loss: 0.0570 - acc: 0.9782 - auc_roc: 0.99 - ETA: 29s - loss: 0.0566
- acc: 0.9784 - auc_roc: 0.99 - ETA: 28s - loss: 0.0559 - acc: 0.9788 - auc_roc:
```

```
0.99 - ETA: 28s - loss: 0.0557 - acc: 0.9790 - auc_roc: 0.99 - ETA: 27s - loss:
0.0557 - acc: 0.9789 - auc_roc: 0.99 - ETA: 26s - loss: 0.0557 - acc: 0.9791 -
auc_roc: 0.99 - ETA: 25s - loss: 0.0555 - acc: 0.9791 - auc_roc: 0.99 - ETA: 25s
- loss: 0.0548 - acc: 0.9794 - auc_roc: 0.99 - ETA: 24s - loss: 0.0545 - acc:
0.9797 - auc_roc: 0.99 - ETA: 24s - loss: 0.0547 - acc: 0.9796 - auc_roc: 0.99 -
ETA: 23s - loss: 0.0546 - acc: 0.9797 - auc_roc: 0.99 - ETA: 22s - loss: 0.0542
- acc: 0.9799 - auc_roc: 0.99 - ETA: 22s - loss: 0.0546 - acc: 0.9798 - auc_roc:
0.99 - ETA: 21s - loss: 0.0544 - acc: 0.9798 - auc_roc: 0.99 - ETA: 20s - loss:
0.0543 - acc: 0.9798 - auc_roc: 0.99 - ETA: 20s - loss: 0.0541 - acc: 0.9798 -
auc_roc: 0.99 - ETA: 19s - loss: 0.0544 - acc: 0.9797 - auc_roc: 0.99 - ETA: 18s
- loss: 0.0545 - acc: 0.9797 - auc_roc: 0.99 - ETA: 18s - loss: 0.0546 - acc:
0.9798 - auc_roc: 0.99 - ETA: 17s - loss: 0.0542 - acc: 0.9800 - auc_roc: 0.99 -
ETA: 16s - loss: 0.0540 - acc: 0.9801 - auc_roc: 0.99 - ETA: 16s - loss: 0.0540
- acc: 0.9801 - auc_roc: 0.99 - ETA: 15s - loss: 0.0540 - acc: 0.9800 - auc_roc:
0.99 - ETA: 14s - loss: 0.0541 - acc: 0.9800 - auc_roc: 0.99 - ETA: 14s - loss:
0.0544 - acc: 0.9798 - auc_roc: 0.99 - ETA: 13s - loss: 0.0544 - acc: 0.9798 -
auc_roc: 0.99 - ETA: 12s - loss: 0.0544 - acc: 0.9799 - auc_roc: 0.99 - ETA: 12s
- loss: 0.0542 - acc: 0.9800 - auc_roc: 0.99 - ETA: 11s - loss: 0.0546 - acc:
0.9798 - auc_roc: 0.99 - ETA: 10s - loss: 0.0550 - acc: 0.9797 - auc_roc: 0.99 -
ETA: 10s - loss: 0.0549 - acc: 0.9798 - auc_roc: 0.99 - ETA: 9s - loss: 0.0548 -
acc: 0.9798 - auc_roc: 0.9963 - ETA: 8s - loss: 0.0549 - acc: 0.9797 - auc_roc:
0.996 - ETA: 8s - loss: 0.0549 - acc: 0.9797 - auc_roc: 0.996 - ETA: 7s - loss:
0.0549 - acc: 0.9798 - auc_roc: 0.996 - ETA: 6s - loss: 0.0550 - acc: 0.9797 -
auc_roc: 0.996 - ETA: 6s - loss: 0.0550 - acc: 0.9797 - auc_roc: 0.996 - ETA: 5s
- loss: 0.0551 - acc: 0.9796 - auc_roc: 0.996 - ETA: 4s - loss: 0.0553 - acc:
0.9796 - auc_roc: 0.996 - ETA: 4s - loss: 0.0553 - acc: 0.9796 - auc_roc: 0.996
- ETA: 3s - loss: 0.0554 - acc: 0.9796 - auc_roc: 0.996 - ETA: 2s - loss: 0.0555
- acc: 0.9795 - auc_roc: 0.996 - ETA: 2s - loss: 0.0558 - acc: 0.9794 - auc_roc:
0.996 - ETA: 1s - loss: 0.0559 - acc: 0.9793 - auc_roc: 0.996 - ETA: 0s - loss:
0.0561 - acc: 0.9793 - auc_roc: 0.996 - ETA: 0s - loss: 0.0560 - acc: 0.9794 -
auc_roc: 0.996 - 51s 725us/step - loss: 0.0560 - acc: 0.9794 - auc_roc: 0.9960 -
val_loss: 1.2202 - val_acc: 0.8074 - val_auc_roc: 0.6430

Epoch 00045: val_auc_roc did not improve from 0.75507
Epoch 46/50
69918/69918 [==============================] - ETA: 43s - loss: 0.0436 - acc:
0.9863 - auc_roc: 0.99 - ETA: 42s - loss: 0.0505 - acc: 0.9824 - auc_roc: 0.99 -
ETA: 41s - loss: 0.0528 - acc: 0.9821 - auc_roc: 0.99 - ETA: 41s - loss: 0.0515
- acc: 0.9827 - auc_roc: 0.99 - ETA: 40s - loss: 0.0501 - acc: 0.9832 - auc_roc:
0.99 - ETA: 40s - loss: 0.0482 - acc: 0.9837 - auc_roc: 0.99 - ETA: 39s - loss:
0.0491 - acc: 0.9830 - auc_roc: 0.99 - ETA: 39s - loss: 0.0500 - acc: 0.9827 -
auc_roc: 0.99 - ETA: 38s - loss: 0.0481 - acc: 0.9834 - auc_roc: 0.99 - ETA: 38s
- loss: 0.0506 - acc: 0.9826 - auc_roc: 0.99 - ETA: 37s - loss: 0.0514 - acc:
0.9825 - auc_roc: 0.99 - ETA: 36s - loss: 0.0514 - acc: 0.9823 - auc_roc: 0.99 -
ETA: 36s - loss: 0.0525 - acc: 0.9816 - auc_roc: 0.99 - ETA: 35s - loss: 0.0515
- acc: 0.9817 - auc_roc: 0.99 - ETA: 34s - loss: 0.0528 - acc: 0.9811 - auc_roc:
0.99 - ETA: 34s - loss: 0.0519 - acc: 0.9814 - auc_roc: 0.99 - ETA: 33s - loss:
0.0516 - acc: 0.9816 - auc_roc: 0.99 - ETA: 32s - loss: 0.0514 - acc: 0.9816 -
```

```
auc_roc: 0.99 - ETA: 32s - loss: 0.0503 - acc: 0.9820 - auc_roc: 0.99 - ETA: 31s
- loss: 0.0499 - acc: 0.9823 - auc_roc: 0.99 - ETA: 31s - loss: 0.0505 - acc:
0.9818 - auc_roc: 0.99 - ETA: 30s - loss: 0.0513 - acc: 0.9817 - auc_roc: 0.99 -
ETA: 29s - loss: 0.0517 - acc: 0.9815 - auc_roc: 0.99 - ETA: 29s - loss: 0.0521
- acc: 0.9814 - auc_roc: 0.99 - ETA: 28s - loss: 0.0518 - acc: 0.9815 - auc_roc:
0.99 - ETA: 27s - loss: 0.0519 - acc: 0.9813 - auc_roc: 0.99 - ETA: 27s - loss:
0.0514 - acc: 0.9816 - auc_roc: 0.99 - ETA: 26s - loss: 0.0514 - acc: 0.9817 -
auc_roc: 0.99 - ETA: 25s - loss: 0.0513 - acc: 0.9818 - auc_roc: 0.99 - ETA: 25s
- loss: 0.0509 - acc: 0.9820 - auc_roc: 0.99 - ETA: 24s - loss: 0.0509 - acc:
0.9820 - auc_roc: 0.99 - ETA: 23s - loss: 0.0513 - acc: 0.9818 - auc_roc: 0.99 -
ETA: 23s - loss: 0.0514 - acc: 0.9817 - auc_roc: 0.99 - ETA: 22s - loss: 0.0517
- acc: 0.9813 - auc_roc: 0.99 - ETA: 21s - loss: 0.0514 - acc: 0.9815 - auc_roc:
0.99 - ETA: 21s - loss: 0.0515 - acc: 0.9814 - auc_roc: 0.99 - ETA: 20s - loss:
0.0516 - acc: 0.9814 - auc_roc: 0.99 - ETA: 19s - loss: 0.0517 - acc: 0.9813 -
auc_roc: 0.99 - ETA: 19s - loss: 0.0517 - acc: 0.9812 - auc_roc: 0.99 - ETA: 18s
- loss: 0.0517 - acc: 0.9811 - auc_roc: 0.99 - ETA: 17s - loss: 0.0518 - acc:
0.9810 - auc_roc: 0.99 - ETA: 17s - loss: 0.0519 - acc: 0.9810 - auc_roc: 0.99 -
ETA: 16s - loss: 0.0517 - acc: 0.9809 - auc_roc: 0.99 - ETA: 16s - loss: 0.0518
- acc: 0.9808 - auc_roc: 0.99 - ETA: 15s - loss: 0.0519 - acc: 0.9808 - auc_roc:
0.99 - ETA: 14s - loss: 0.0522 - acc: 0.9807 - auc_roc: 0.99 - ETA: 14s - loss:
0.0522 - acc: 0.9807 - auc_roc: 0.99 - ETA: 13s - loss: 0.0522 - acc: 0.9807 -
auc_roc: 0.99 - ETA: 12s - loss: 0.0522 - acc: 0.9807 - auc_roc: 0.99 - ETA: 12s
- loss: 0.0527 - acc: 0.9804 - auc_roc: 0.99 - ETA: 11s - loss: 0.0528 - acc:
0.9804 - auc_roc: 0.99 - ETA: 10s - loss: 0.0529 - acc: 0.9803 - auc_roc: 0.99 -
ETA: 10s - loss: 0.0531 - acc: 0.9803 - auc_roc: 0.99 - ETA: 9s - loss: 0.0532 -
acc: 0.9802 - auc_roc: 0.9964 - ETA: 8s - loss: 0.0528 - acc: 0.9803 - auc_roc:
0.996 - ETA: 8s - loss: 0.0530 - acc: 0.9802 - auc_roc: 0.996 - ETA: 7s - loss:
0.0530 - acc: 0.9801 - auc_roc: 0.996 - ETA: 6s - loss: 0.0529 - acc: 0.9802 -
auc_roc: 0.996 - ETA: 6s - loss: 0.0530 - acc: 0.9802 - auc_roc: 0.996 - ETA: 5s
- loss: 0.0527 - acc: 0.9803 - auc_roc: 0.996 - ETA: 4s - loss: 0.0530 - acc:
0.9802 - auc_roc: 0.996 - ETA: 4s - loss: 0.0531 - acc: 0.9802 - auc_roc: 0.996
- ETA: 3s - loss: 0.0532 - acc: 0.9801 - auc_roc: 0.996 - ETA: 2s - loss: 0.0533
- acc: 0.9800 - auc_roc: 0.996 - ETA: 2s - loss: 0.0535 - acc: 0.9800 - auc_roc:
0.996 - ETA: 1s - loss: 0.0534 - acc: 0.9800 - auc_roc: 0.996 - ETA: 0s - loss:
0.0537 - acc: 0.9798 - auc_roc: 0.996 - ETA: 0s - loss: 0.0539 - acc: 0.9797 -
auc_roc: 0.996 - 51s 724us/step - loss: 0.0540 - acc: 0.9797 - auc_roc: 0.9963 -
val_loss: 1.2315 - val_acc: 0.8067 - val_auc_roc: 0.6467

Epoch 00046: val_auc_roc did not improve from 0.75507
Epoch 47/50
69918/69918 [==============================] - ETA: 42s - loss: 0.0460 - acc:
0.9805 - auc_roc: 0.99 - ETA: 43s - loss: 0.0437 - acc: 0.9834 - auc_roc: 0.99 -
ETA: 42s - loss: 0.0459 - acc: 0.9814 - auc_roc: 0.99 - ETA: 42s - loss: 0.0467
- acc: 0.9812 - auc_roc: 0.99 - ETA: 41s - loss: 0.0462 - acc: 0.9816 - auc_roc:
0.99 - ETA: 40s - loss: 0.0474 - acc: 0.9813 - auc_roc: 0.99 - ETA: 40s - loss:
0.0494 - acc: 0.9807 - auc_roc: 0.99 - ETA: 39s - loss: 0.0488 - acc: 0.9811 -
auc_roc: 0.99 - ETA: 38s - loss: 0.0480 - acc: 0.9813 - auc_roc: 0.99 - ETA: 38s
- loss: 0.0474 - acc: 0.9817 - auc_roc: 0.99 - ETA: 37s - loss: 0.0497 - acc:
```

```
0.9810 - auc_roc: 0.99 - ETA: 37s - loss: 0.0487 - acc: 0.9816 - auc_roc: 0.99 -
ETA: 36s - loss: 0.0488 - acc: 0.9815 - auc_roc: 0.99 - ETA: 35s - loss: 0.0479
- acc: 0.9818 - auc_roc: 0.99 - ETA: 35s - loss: 0.0481 - acc: 0.9819 - auc_roc:
0.99 - ETA: 34s - loss: 0.0490 - acc: 0.9818 - auc_roc: 0.99 - ETA: 33s - loss:
0.0500 - acc: 0.9812 - auc_roc: 0.99 - ETA: 33s - loss: 0.0501 - acc: 0.9814 -
auc_roc: 0.99 - ETA: 32s - loss: 0.0506 - acc: 0.9811 - auc_roc: 0.99 - ETA: 31s
- loss: 0.0509 - acc: 0.9808 - auc_roc: 0.99 - ETA: 31s - loss: 0.0510 - acc:
0.9808 - auc_roc: 0.99 - ETA: 30s - loss: 0.0506 - acc: 0.9807 - auc_roc: 0.99 -
ETA: 29s - loss: 0.0505 - acc: 0.9809 - auc_roc: 0.99 - ETA: 29s - loss: 0.0503
- acc: 0.9810 - auc_roc: 0.99 - ETA: 28s - loss: 0.0505 - acc: 0.9810 - auc_roc:
0.99 - ETA: 27s - loss: 0.0504 - acc: 0.9810 - auc_roc: 0.99 - ETA: 27s - loss:
0.0501 - acc: 0.9810 - auc_roc: 0.99 - ETA: 26s - loss: 0.0505 - acc: 0.9810 -
auc_roc: 0.99 - ETA: 25s - loss: 0.0500 - acc: 0.9811 - auc_roc: 0.99 - ETA: 25s
- loss: 0.0495 - acc: 0.9813 - auc_roc: 0.99 - ETA: 24s - loss: 0.0492 - acc:
0.9814 - auc_roc: 0.99 - ETA: 24s - loss: 0.0493 - acc: 0.9813 - auc_roc: 0.99 -
ETA: 23s - loss: 0.0493 - acc: 0.9814 - auc_roc: 0.99 - ETA: 22s - loss: 0.0495
- acc: 0.9813 - auc_roc: 0.99 - ETA: 22s - loss: 0.0497 - acc: 0.9813 - auc_roc:
0.99 - ETA: 21s - loss: 0.0496 - acc: 0.9813 - auc_roc: 0.99 - ETA: 20s - loss:
0.0491 - acc: 0.9814 - auc_roc: 0.99 - ETA: 20s - loss: 0.0494 - acc: 0.9813 -
auc_roc: 0.99 - ETA: 19s - loss: 0.0492 - acc: 0.9815 - auc_roc: 0.99 - ETA: 18s
- loss: 0.0489 - acc: 0.9815 - auc_roc: 0.99 - ETA: 18s - loss: 0.0486 - acc:
0.9817 - auc_roc: 0.99 - ETA: 17s - loss: 0.0486 - acc: 0.9817 - auc_roc: 0.99 -
ETA: 16s - loss: 0.0485 - acc: 0.9817 - auc_roc: 0.99 - ETA: 16s - loss: 0.0486
- acc: 0.9818 - auc_roc: 0.99 - ETA: 15s - loss: 0.0485 - acc: 0.9818 - auc_roc:
0.99 - ETA: 14s - loss: 0.0483 - acc: 0.9819 - auc_roc: 0.99 - ETA: 14s - loss:
0.0481 - acc: 0.9819 - auc_roc: 0.99 - ETA: 13s - loss: 0.0481 - acc: 0.9819 -
auc_roc: 0.99 - ETA: 12s - loss: 0.0482 - acc: 0.9819 - auc_roc: 0.99 - ETA: 12s
- loss: 0.0480 - acc: 0.9819 - auc_roc: 0.99 - ETA: 11s - loss: 0.0480 - acc:
0.9820 - auc_roc: 0.99 - ETA: 10s - loss: 0.0481 - acc: 0.9820 - auc_roc: 0.99 -
ETA: 10s - loss: 0.0481 - acc: 0.9820 - auc_roc: 0.99 - ETA: 9s - loss: 0.0480 -
acc: 0.9820 - auc_roc: 0.9970 - ETA: 8s - loss: 0.0479 - acc: 0.9820 - auc_roc:
0.997 - ETA: 8s - loss: 0.0477 - acc: 0.9821 - auc_roc: 0.997 - ETA: 7s - loss:
0.0478 - acc: 0.9821 - auc_roc: 0.997 - ETA: 6s - loss: 0.0478 - acc: 0.9821 -
auc_roc: 0.997 - ETA: 6s - loss: 0.0478 - acc: 0.9821 - auc_roc: 0.997 - ETA: 5s
- loss: 0.0477 - acc: 0.9822 - auc_roc: 0.997 - ETA: 4s - loss: 0.0478 - acc:
0.9821 - auc_roc: 0.997 - ETA: 4s - loss: 0.0478 - acc: 0.9821 - auc_roc: 0.997
- ETA: 3s - loss: 0.0476 - acc: 0.9822 - auc_roc: 0.997 - ETA: 2s - loss: 0.0476
- acc: 0.9821 - auc_roc: 0.997 - ETA: 2s - loss: 0.0475 - acc: 0.9822 - auc_roc:
0.997 - ETA: 1s - loss: 0.0475 - acc: 0.9822 - auc_roc: 0.997 - ETA: 0s - loss:
0.0475 - acc: 0.9822 - auc_roc: 0.997 - ETA: 0s - loss: 0.0476 - acc: 0.9822 -
auc_roc: 0.997 - 51s 727us/step - loss: 0.0476 - acc: 0.9822 - auc_roc: 0.9970 -
val_loss: 1.3346 - val_acc: 0.8112 - val_auc_roc: 0.6512

Epoch 00047: val_auc_roc did not improve from 0.75507
Epoch 48/50
69918/69918 [==============================] - ETA: 42s - loss: 0.0311 - acc:
0.9902 - auc_roc: 0.99 - ETA: 42s - loss: 0.0384 - acc: 0.9883 - auc_roc: 0.99 -
ETA: 41s - loss: 0.0373 - acc: 0.9880 - auc_roc: 0.99 - ETA: 41s - loss: 0.0383
```

- acc: 0.9875 - auc_roc: 0.99 - ETA: 40s - loss: 0.0379 - acc: 0.9871 - auc_roc: 0.99 - ETA: 40s - loss: 0.0377 - acc: 0.9873 - auc_roc: 0.99 - ETA: 40s - loss: 0.0401 - acc: 0.9860 - auc_roc: 0.99 - ETA: 39s - loss: 0.0395 - acc: 0.9857 - auc_roc: 0.99 - ETA: 38s - loss: 0.0412 - acc: 0.9852 - auc_roc: 0.99 - ETA: 38s - loss: 0.0408 - acc: 0.9851 - auc_roc: 0.99 - ETA: 37s - loss: 0.0409 - acc: 0.9849 - auc_roc: 0.99 - ETA: 36s - loss: 0.0414 - acc: 0.9845 - auc_roc: 0.99 - ETA: 36s - loss: 0.0419 - acc: 0.9845 - auc_roc: 0.99 - ETA: 35s - loss: 0.0414 - acc: 0.9848 - auc_roc: 0.99 - ETA: 34s - loss: 0.0416 - acc: 0.9846 - auc_roc: 0.99 - ETA: 34s - loss: 0.0415 - acc: 0.9845 - auc_roc: 0.99 - ETA: 33s - loss: 0.0411 - acc: 0.9848 - auc_roc: 0.99 - ETA: 32s - loss: 0.0418 - acc: 0.9845 - auc_roc: 0.99 - ETA: 32s - loss: 0.0418 - acc: 0.9845 - auc_roc: 0.99 - ETA: 31s - loss: 0.0426 - acc: 0.9841 - auc_roc: 0.99 - ETA: 30s - loss: 0.0427 - acc: 0.9842 - auc_roc: 0.99 - ETA: 30s - loss: 0.0434 - acc: 0.9840 - auc_roc: 0.99 - ETA: 29s - loss: 0.0435 - acc: 0.9838 - auc_roc: 0.99 - ETA: 29s - loss: 0.0430 - acc: 0.9840 - auc_roc: 0.99 - ETA: 28s - loss: 0.0432 - acc: 0.9839 - auc_roc: 0.99 - ETA: 27s - loss: 0.0436 - acc: 0.9839 - auc_roc: 0.99 - ETA: 27s - loss: 0.0435 - acc: 0.9840 - auc_roc: 0.99 - ETA: 26s - loss: 0.0433 - acc: 0.9840 - auc_roc: 0.99 - ETA: 25s - loss: 0.0434 - acc: 0.9840 - auc_roc: 0.99 - ETA: 25s - loss: 0.0435 - acc: 0.9839 - auc_roc: 0.99 - ETA: 24s - loss: 0.0440 - acc: 0.9837 - auc_roc: 0.99 - ETA: 23s - loss: 0.0434 - acc: 0.9840 - auc_roc: 0.99 - ETA: 23s - loss: 0.0440 - acc: 0.9836 - auc_roc: 0.99 - ETA: 22s - loss: 0.0442 - acc: 0.9835 - auc_roc: 0.99 - ETA: 21s - loss: 0.0445 - acc: 0.9833 - auc_roc: 0.99 - ETA: 21s - loss: 0.0448 - acc: 0.9832 - auc_roc: 0.99 - ETA: 20s - loss: 0.0447 - acc: 0.9833 - auc_roc: 0.99 - ETA: 19s - loss: 0.0450 - acc: 0.9831 - auc_roc: 0.99 - ETA: 19s - loss: 0.0454 - acc: 0.9830 - auc_roc: 0.99 - ETA: 18s - loss: 0.0455 - acc: 0.9830 - auc_roc: 0.99 - ETA: 17s - loss: 0.0453 - acc: 0.9831 - auc_roc: 0.99 - ETA: 17s - loss: 0.0454 - acc: 0.9831 - auc_roc: 0.99 - ETA: 16s - loss: 0.0465 - acc: 0.9828 - auc_roc: 0.99 - ETA: 16s - loss: 0.0465 - acc: 0.9829 - auc_roc: 0.99 - ETA: 15s - loss: 0.0470 - acc: 0.9826 - auc_roc: 0.99 - ETA: 14s - loss: 0.0468 - acc: 0.9826 - auc_roc: 0.99 - ETA: 14s - loss: 0.0468 - acc: 0.9826 - auc_roc: 0.99 - ETA: 13s - loss: 0.0466 - acc: 0.9826 - auc_roc: 0.99 - ETA: 12s - loss: 0.0465 - acc: 0.9825 - auc_roc: 0.99 - ETA: 12s - loss: 0.0465 - acc: 0.9825 - auc_roc: 0.99 - ETA: 11s - loss: 0.0465 - acc: 0.9826 - auc_roc: 0.99 - ETA: 10s - loss: 0.0463 - acc: 0.9827 - auc_roc: 0.99 - ETA: 10s - loss: 0.0463 - acc: 0.9827 - auc_roc: 0.99 - ETA: 9s - loss: 0.0464 - acc: 0.9827 - auc_roc: 0.9971 - ETA: 8s - loss: 0.0465 - acc: 0.9827 - auc_roc: 0.997 - ETA: 8s - loss: 0.0465 - acc: 0.9826 - auc_roc: 0.997 - ETA: 7s - loss: 0.0468 - acc: 0.9825 - auc_roc: 0.997 - ETA: 6s - loss: 0.0471 - acc: 0.9824 - auc_roc: 0.997 - ETA: 6s - loss: 0.0474 - acc: 0.9824 - auc_roc: 0.997 - ETA: 5s - loss: 0.0473 - acc: 0.9823 - auc_roc: 0.997 - ETA: 4s - loss: 0.0473 - acc: 0.9823 - auc_roc: 0.997 - ETA: 4s - loss: 0.0474 - acc: 0.9822 - auc_roc: 0.997 - ETA: 3s - loss: 0.0473 - acc: 0.9823 - auc_roc: 0.997 - ETA: 2s - loss: 0.0474 - acc: 0.9823 - auc_roc: 0.997 - ETA: 2s - loss: 0.0474 - acc: 0.9823 - auc_roc: 0.997 - ETA: 1s - loss: 0.0475 - acc: 0.9823 - auc_roc: 0.997 - ETA: 0s - loss: 0.0475 - acc: 0.9823 - auc_roc: 0.997 - ETA: 0s - loss: 0.0473 - acc: 0.9823 - auc_roc: 0.997 - 51s 723us/step - loss: 0.0473 - acc: 0.9823 - auc_roc: 0.9971 - val_loss: 1.2985 - val_acc: 0.8170 - val_auc_roc: 0.6519

```
Epoch 00048: val_auc_roc did not improve from 0.75507
Epoch 49/50
69918/69918 [==============================] - ETA: 43s - loss: 0.0348 - acc:
0.9893 - auc_roc: 0.99 - ETA: 43s - loss: 0.0411 - acc: 0.9868 - auc_roc: 0.99 -
ETA: 42s - loss: 0.0446 - acc: 0.9854 - auc_roc: 0.99 - ETA: 42s - loss: 0.0455
- acc: 0.9846 - auc_roc: 0.99 - ETA: 41s - loss: 0.0473 - acc: 0.9834 - auc_roc:
0.99 - ETA: 41s - loss: 0.0455 - acc: 0.9844 - auc_roc: 0.99 - ETA: 40s - loss:
0.0458 - acc: 0.9840 - auc_roc: 0.99 - ETA: 39s - loss: 0.0486 - acc: 0.9829 -
auc_roc: 0.99 - ETA: 39s - loss: 0.0478 - acc: 0.9830 - auc_roc: 0.99 - ETA: 38s
- loss: 0.0465 - acc: 0.9831 - auc_roc: 0.99 - ETA: 37s - loss: 0.0455 - acc:
0.9835 - auc_roc: 0.99 - ETA: 37s - loss: 0.0455 - acc: 0.9832 - auc_roc: 0.99 -
ETA: 36s - loss: 0.0455 - acc: 0.9829 - auc_roc: 0.99 - ETA: 35s - loss: 0.0456
- acc: 0.9826 - auc_roc: 0.99 - ETA: 34s - loss: 0.0458 - acc: 0.9824 - auc_roc:
0.99 - ETA: 34s - loss: 0.0460 - acc: 0.9824 - auc_roc: 0.99 - ETA: 33s - loss:
0.0448 - acc: 0.9830 - auc_roc: 0.99 - ETA: 33s - loss: 0.0446 - acc: 0.9831 -
auc_roc: 0.99 - ETA: 32s - loss: 0.0445 - acc: 0.9832 - auc_roc: 0.99 - ETA: 31s
- loss: 0.0443 - acc: 0.9833 - auc_roc: 0.99 - ETA: 31s - loss: 0.0448 - acc:
0.9832 - auc_roc: 0.99 - ETA: 30s - loss: 0.0448 - acc: 0.9831 - auc_roc: 0.99 -
ETA: 29s - loss: 0.0451 - acc: 0.9830 - auc_roc: 0.99 - ETA: 29s - loss: 0.0449
- acc: 0.9830 - auc_roc: 0.99 - ETA: 28s - loss: 0.0450 - acc: 0.9832 - auc_roc:
0.99 - ETA: 27s - loss: 0.0456 - acc: 0.9830 - auc_roc: 0.99 - ETA: 27s - loss:
0.0456 - acc: 0.9829 - auc_roc: 0.99 - ETA: 26s - loss: 0.0457 - acc: 0.9829 -
auc_roc: 0.99 - ETA: 25s - loss: 0.0455 - acc: 0.9830 - auc_roc: 0.99 - ETA: 25s
- loss: 0.0454 - acc: 0.9830 - auc_roc: 0.99 - ETA: 24s - loss: 0.0453 - acc:
0.9831 - auc_roc: 0.99 - ETA: 24s - loss: 0.0452 - acc: 0.9832 - auc_roc: 0.99 -
ETA: 23s - loss: 0.0452 - acc: 0.9831 - auc_roc: 0.99 - ETA: 22s - loss: 0.0452
- acc: 0.9831 - auc_roc: 0.99 - ETA: 22s - loss: 0.0452 - acc: 0.9832 - auc_roc:
0.99 - ETA: 21s - loss: 0.0452 - acc: 0.9832 - auc_roc: 0.99 - ETA: 20s - loss:
0.0456 - acc: 0.9831 - auc_roc: 0.99 - ETA: 20s - loss: 0.0457 - acc: 0.9831 -
auc_roc: 0.99 - ETA: 19s - loss: 0.0457 - acc: 0.9830 - auc_roc: 0.99 - ETA: 18s
- loss: 0.0456 - acc: 0.9829 - auc_roc: 0.99 - ETA: 18s - loss: 0.0456 - acc:
0.9829 - auc_roc: 0.99 - ETA: 17s - loss: 0.0456 - acc: 0.9828 - auc_roc: 0.99 -
ETA: 16s - loss: 0.0456 - acc: 0.9828 - auc_roc: 0.99 - ETA: 16s - loss: 0.0455
- acc: 0.9828 - auc_roc: 0.99 - ETA: 15s - loss: 0.0453 - acc: 0.9829 - auc_roc:
0.99 - ETA: 14s - loss: 0.0457 - acc: 0.9828 - auc_roc: 0.99 - ETA: 14s - loss:
0.0459 - acc: 0.9828 - auc_roc: 0.99 - ETA: 13s - loss: 0.0458 - acc: 0.9829 -
auc_roc: 0.99 - ETA: 12s - loss: 0.0459 - acc: 0.9829 - auc_roc: 0.99 - ETA: 12s
- loss: 0.0458 - acc: 0.9829 - auc_roc: 0.99 - ETA: 11s - loss: 0.0459 - acc:
0.9829 - auc_roc: 0.99 - ETA: 10s - loss: 0.0458 - acc: 0.9829 - auc_roc: 0.99 -
ETA: 10s - loss: 0.0457 - acc: 0.9830 - auc_roc: 0.99 - ETA: 9s - loss: 0.0460 -
acc: 0.9829 - auc_roc: 0.9974 - ETA: 8s - loss: 0.0458 - acc: 0.9830 - auc_roc:
0.997 - ETA: 8s - loss: 0.0460 - acc: 0.9829 - auc_roc: 0.997 - ETA: 7s - loss:
0.0459 - acc: 0.9830 - auc_roc: 0.997 - ETA: 6s - loss: 0.0461 - acc: 0.9828 -
auc_roc: 0.997 - ETA: 6s - loss: 0.0461 - acc: 0.9828 - auc_roc: 0.997 - ETA: 5s
- loss: 0.0465 - acc: 0.9826 - auc_roc: 0.997 - ETA: 4s - loss: 0.0464 - acc:
0.9825 - auc_roc: 0.997 - ETA: 4s - loss: 0.0465 - acc: 0.9825 - auc_roc: 0.997
- ETA: 3s - loss: 0.0468 - acc: 0.9825 - auc_roc: 0.997 - ETA: 2s - loss: 0.0468
- acc: 0.9824 - auc_roc: 0.997 - ETA: 2s - loss: 0.0470 - acc: 0.9823 - auc_roc:
```

```
0.997 - ETA: 1s - loss: 0.0470 - acc: 0.9823 - auc_roc: 0.997 - ETA: 0s - loss:
0.0468 - acc: 0.9823 - auc_roc: 0.997 - ETA: 0s - loss: 0.0467 - acc: 0.9824 -
auc_roc: 0.997 - 51s 728us/step - loss: 0.0466 - acc: 0.9824 - auc_roc: 0.9973 -
val_loss: 1.3705 - val_acc: 0.8212 - val_auc_roc: 0.6552

Epoch 00049: val_auc_roc did not improve from 0.75507
Epoch 50/50
69918/69918 [==============================] - ETA: 44s - loss: 0.0462 - acc:
0.9863 - auc_roc: 0.99 - ETA: 44s - loss: 0.0402 - acc: 0.9849 - auc_roc: 0.99 -
ETA: 43s - loss: 0.0401 - acc: 0.9854 - auc_roc: 0.99 - ETA: 43s - loss: 0.0398
- acc: 0.9856 - auc_roc: 0.99 - ETA: 41s - loss: 0.0398 - acc: 0.9854 - auc_roc:
0.99 - ETA: 41s - loss: 0.0405 - acc: 0.9845 - auc_roc: 0.99 - ETA: 41s - loss:
0.0406 - acc: 0.9851 - auc_roc: 0.99 - ETA: 40s - loss: 0.0399 - acc: 0.9852 -
auc_roc: 0.99 - ETA: 39s - loss: 0.0407 - acc: 0.9848 - auc_roc: 0.99 - ETA: 38s
- loss: 0.0403 - acc: 0.9848 - auc_roc: 0.99 - ETA: 37s - loss: 0.0400 - acc:
0.9853 - auc_roc: 0.99 - ETA: 37s - loss: 0.0393 - acc: 0.9855 - auc_roc: 0.99 -
ETA: 36s - loss: 0.0393 - acc: 0.9856 - auc_roc: 0.99 - ETA: 35s - loss: 0.0397
- acc: 0.9856 - auc_roc: 0.99 - ETA: 35s - loss: 0.0396 - acc: 0.9858 - auc_roc:
0.99 - ETA: 34s - loss: 0.0401 - acc: 0.9853 - auc_roc: 0.99 - ETA: 33s - loss:
0.0402 - acc: 0.9855 - auc_roc: 0.99 - ETA: 33s - loss: 0.0406 - acc: 0.9851 -
auc_roc: 0.99 - ETA: 32s - loss: 0.0403 - acc: 0.9852 - auc_roc: 0.99 - ETA: 32s
- loss: 0.0407 - acc: 0.9851 - auc_roc: 0.99 - ETA: 31s - loss: 0.0407 - acc:
0.9851 - auc_roc: 0.99 - ETA: 30s - loss: 0.0405 - acc: 0.9849 - auc_roc: 0.99 -
ETA: 29s - loss: 0.0405 - acc: 0.9849 - auc_roc: 0.99 - ETA: 29s - loss: 0.0402
- acc: 0.9849 - auc_roc: 0.99 - ETA: 28s - loss: 0.0404 - acc: 0.9849 - auc_roc:
0.99 - ETA: 27s - loss: 0.0405 - acc: 0.9848 - auc_roc: 0.99 - ETA: 27s - loss:
0.0404 - acc: 0.9848 - auc_roc: 0.99 - ETA: 26s - loss: 0.0406 - acc: 0.9846 -
auc_roc: 0.99 - ETA: 25s - loss: 0.0408 - acc: 0.9845 - auc_roc: 0.99 - ETA: 25s
- loss: 0.0403 - acc: 0.9846 - auc_roc: 0.99 - ETA: 24s - loss: 0.0402 - acc:
0.9847 - auc_roc: 0.99 - ETA: 23s - loss: 0.0407 - acc: 0.9846 - auc_roc: 0.99 -
ETA: 23s - loss: 0.0408 - acc: 0.9847 - auc_roc: 0.99 - ETA: 22s - loss: 0.0413
- acc: 0.9847 - auc_roc: 0.99 - ETA: 21s - loss: 0.0413 - acc: 0.9847 - auc_roc:
0.99 - ETA: 21s - loss: 0.0413 - acc: 0.9848 - auc_roc: 0.99 - ETA: 20s - loss:
0.0416 - acc: 0.9847 - auc_roc: 0.99 - ETA: 19s - loss: 0.0418 - acc: 0.9846 -
auc_roc: 0.99 - ETA: 19s - loss: 0.0418 - acc: 0.9845 - auc_roc: 0.99 - ETA: 18s
- loss: 0.0419 - acc: 0.9845 - auc_roc: 0.99 - ETA: 17s - loss: 0.0422 - acc:
0.9844 - auc_roc: 0.99 - ETA: 17s - loss: 0.0423 - acc: 0.9842 - auc_roc: 0.99 -
ETA: 16s - loss: 0.0422 - acc: 0.9842 - auc_roc: 0.99 - ETA: 16s - loss: 0.0420
- acc: 0.9843 - auc_roc: 0.99 - ETA: 15s - loss: 0.0424 - acc: 0.9842 - auc_roc:
0.99 - ETA: 14s - loss: 0.0424 - acc: 0.9842 - auc_roc: 0.99 - ETA: 14s - loss:
0.0425 - acc: 0.9843 - auc_roc: 0.99 - ETA: 13s - loss: 0.0427 - acc: 0.9841 -
auc_roc: 0.99 - ETA: 12s - loss: 0.0429 - acc: 0.9841 - auc_roc: 0.99 - ETA: 12s
- loss: 0.0430 - acc: 0.9840 - auc_roc: 0.99 - ETA: 11s - loss: 0.0434 - acc:
0.9839 - auc_roc: 0.99 - ETA: 10s - loss: 0.0437 - acc: 0.9838 - auc_roc: 0.99 -
ETA: 10s - loss: 0.0441 - acc: 0.9837 - auc_roc: 0.99 - ETA: 9s - loss: 0.0441 -
acc: 0.9838 - auc_roc: 0.9975 - ETA: 8s - loss: 0.0442 - acc: 0.9837 - auc_roc:
0.997 - ETA: 8s - loss: 0.0442 - acc: 0.9837 - auc_roc: 0.997 - ETA: 7s - loss:
0.0444 - acc: 0.9836 - auc_roc: 0.997 - ETA: 6s - loss: 0.0446 - acc: 0.9836 -
```

```
auc_roc: 0.997 - ETA: 6s - loss: 0.0448 - acc: 0.9835 - auc_roc: 0.997 - ETA: 5s
- loss: 0.0450 - acc: 0.9834 - auc_roc: 0.997 - ETA: 4s - loss: 0.0453 - acc:
0.9833 - auc_roc: 0.997 - ETA: 4s - loss: 0.0456 - acc: 0.9831 - auc_roc: 0.997
- ETA: 3s - loss: 0.0459 - acc: 0.9830 - auc_roc: 0.997 - ETA: 2s - loss: 0.0460
- acc: 0.9829 - auc_roc: 0.997 - ETA: 2s - loss: 0.0460 - acc: 0.9829 - auc_roc:
0.997 - ETA: 1s - loss: 0.0462 - acc: 0.9829 - auc_roc: 0.997 - ETA: 0s - loss:
0.0465 - acc: 0.9827 - auc_roc: 0.997 - ETA: 0s - loss: 0.0465 - acc: 0.9827 -
auc_roc: 0.997 - 51s 725us/step - loss: 0.0466 - acc: 0.9827 - auc_roc: 0.9972 -
val_loss: 1.2680 - val_acc: 0.8086 - val_auc_roc: 0.6542

Epoch 00050: val_auc_roc did not improve from 0.75507
```

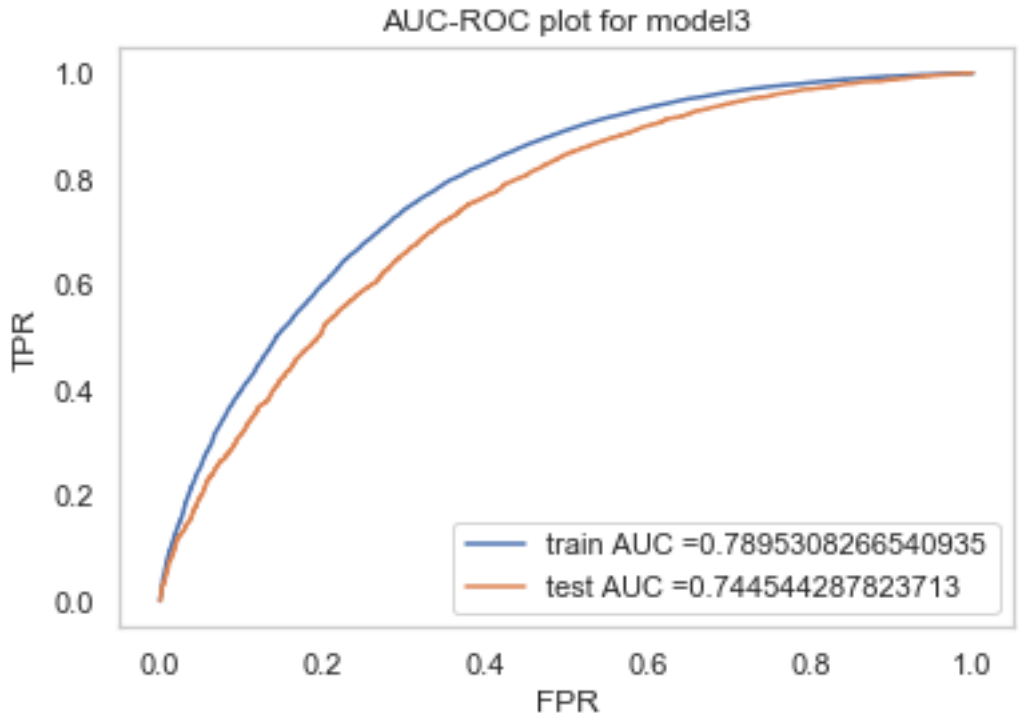
[55]:
```
<keras.callbacks.History at 0x1e1620b7e80>
```

[56]:
```
merged_model3 = load_model('weights-improvement-model3.hdf5',␣
↪custom_objects={'auc_roc': auc_roc})
```

[57]:
```
result3_test = merged_model3.predict(x=[padded_docs_text_test,␣
↪model3_other_than_text_test])
```

[58]:
```
result3_train = merged_model3.predict(x=[padded_docs_text_train,␣
↪model3_other_than_text_train])
```

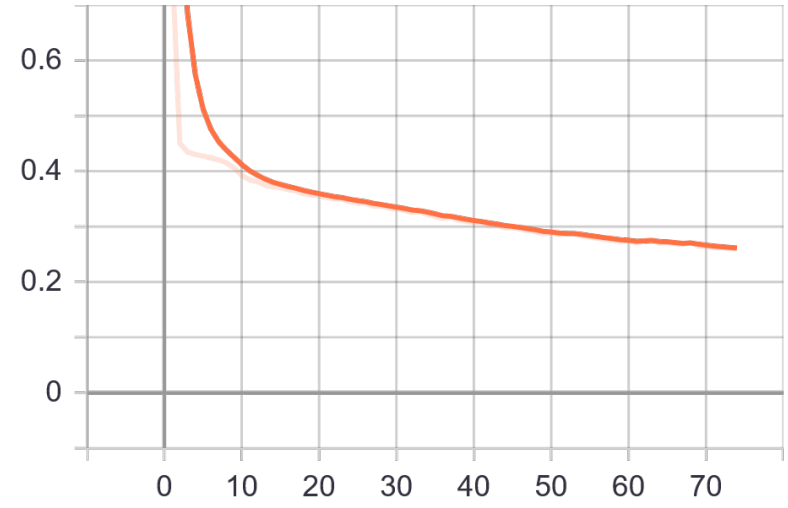
[59]:
```
# https://scikit-learn.org/stable/modules/generated/sklearn.metrics.roc_curve.
↪html#sklearn.metrics.roc_curve
import matplotlib.pyplot as plt
from sklearn.metrics import roc_curve, auc

train_fpr, train_tpr, tr_thresholds = roc_curve(y_train, result3_train)
test_fpr, test_tpr, te_thresholds = roc_curve(y_test, result3_test)

plt.plot(train_fpr, train_tpr, label="train AUC ="+str(auc(train_fpr,␣
↪train_tpr)))
plt.plot(test_fpr, test_tpr, label="test AUC ="+str(auc(test_fpr, test_tpr)))
plt.legend()
plt.xlabel("FPR")
plt.ylabel("TPR")
plt.title("AUC-ROC plot for model3")
plt.grid()
plt.show()
```



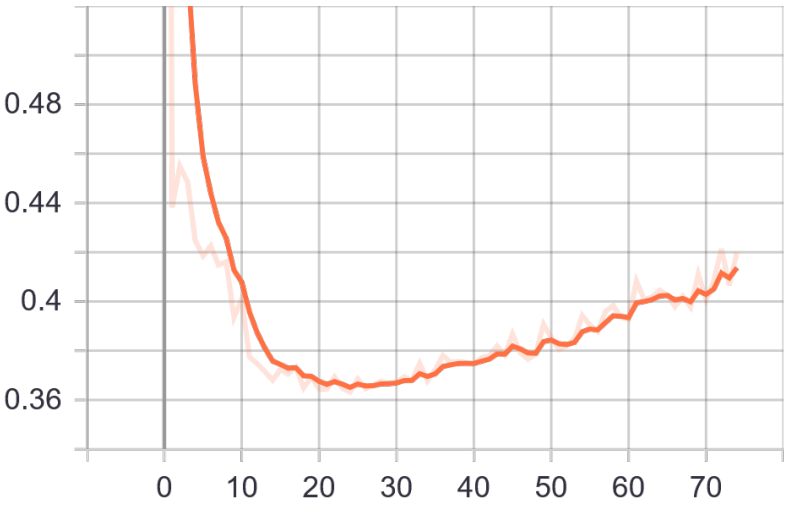
[60]:
```
from prettytable import PrettyTable
x = PrettyTable()
x.field_names = ["Model", "train auc","test auc"]
x.add_row(["Model 1", 0.79, 0.75])
x.add_row(["Model 2", 0.77, 0.73])
x.add_row(["Model 3", 0.78, 0.74])

x.border=True
print(x)
```

```
+---------+-----------+----------+
|  Model  | train auc | test auc |
+---------+-----------+----------+
| Model 1 |    0.79   |   0.75   |
| Model 2 |    0.77   |   0.73   |
| Model 3 |    0.78   |   0.74   |
+---------+-----------+----------+
```

4.0.1 Error plots generated in tensorboard

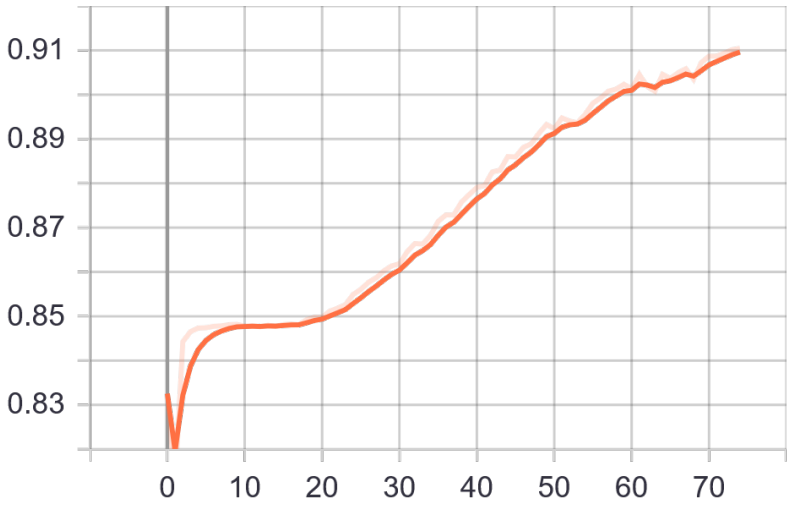


Model1 train loss

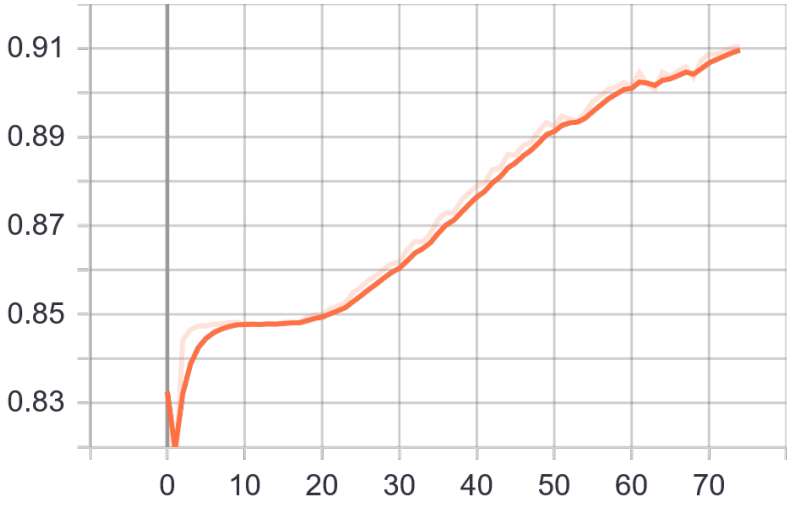


Model1 validation loss

Model1 loss (train -test)

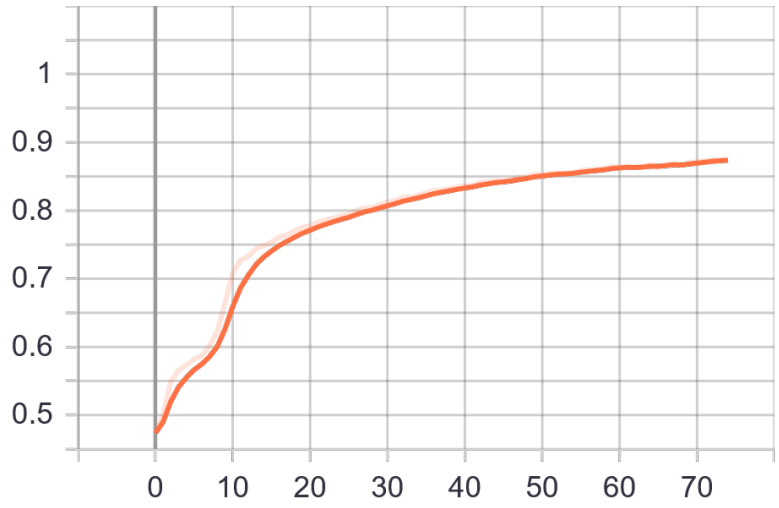


Model1 train accuracy

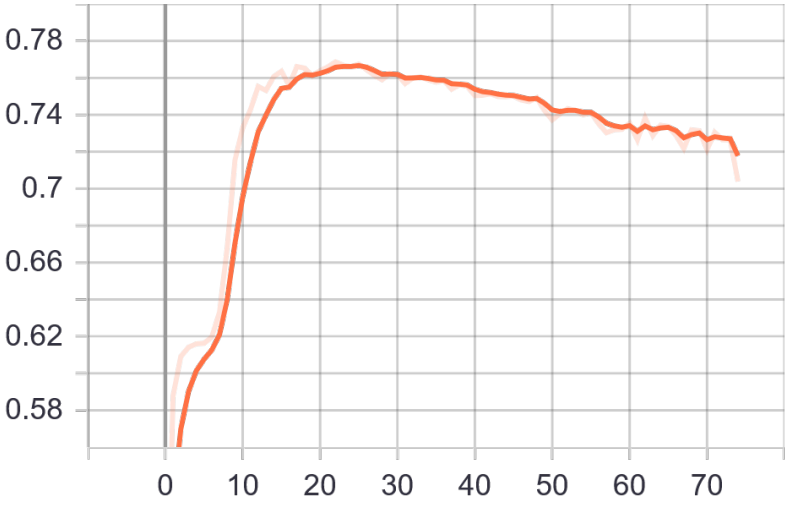


Model1 validation accuracy

Model1 accuracy (train -test)

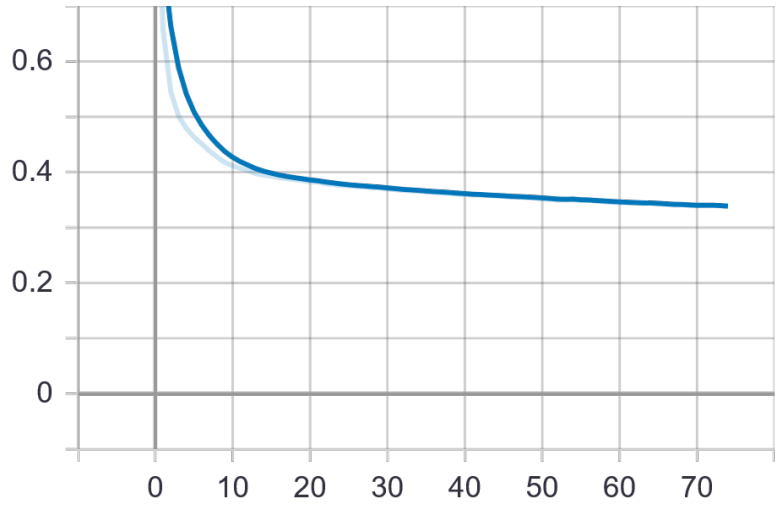


Model1 train auc

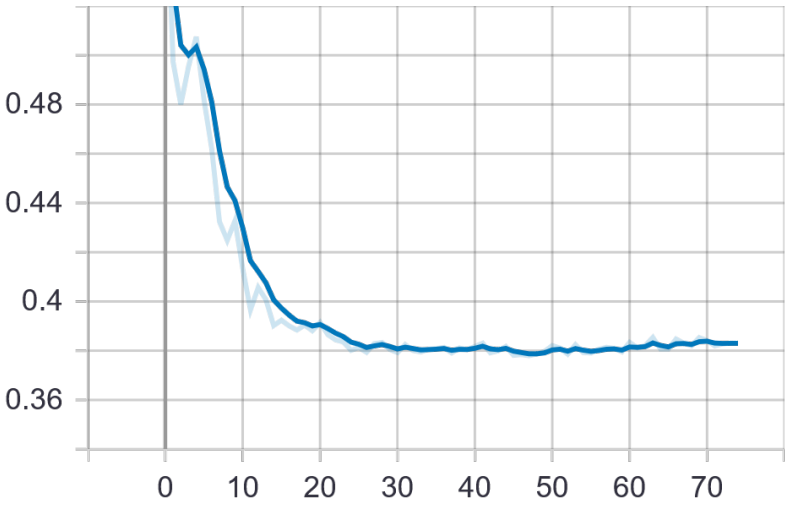


Model1 validation auc

Model1 auc-roc (train -test)

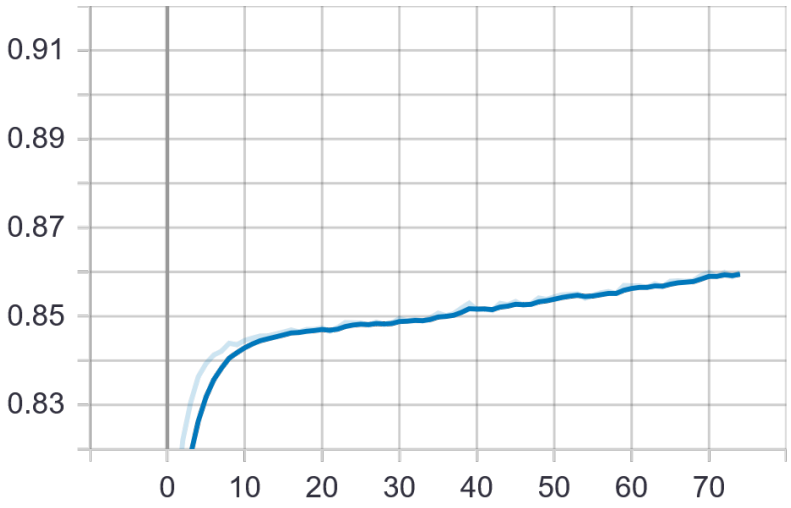


Model2 train loss

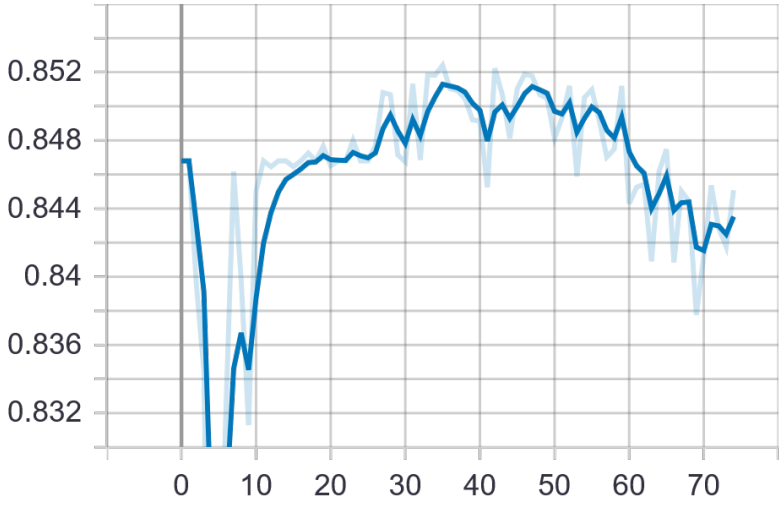


Model2 validation loss

Model2 loss (train -test)

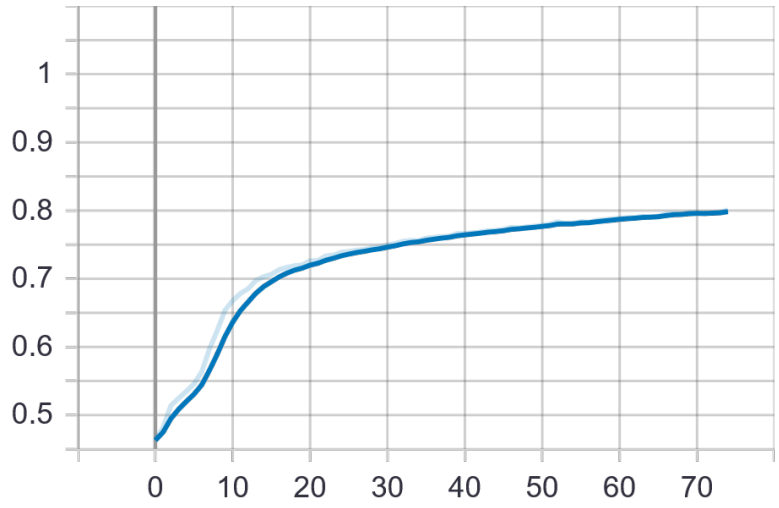


Model2 train accuaracy

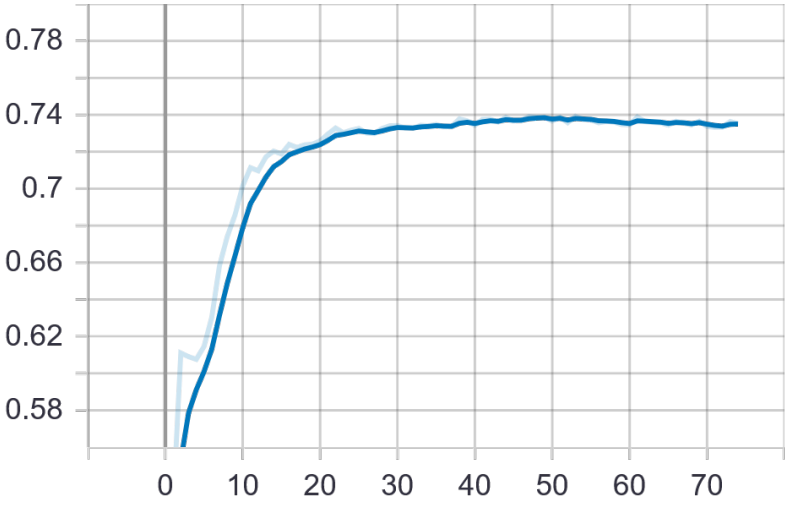


Model2 validation accuracy

Model2 accuracy (train -test)

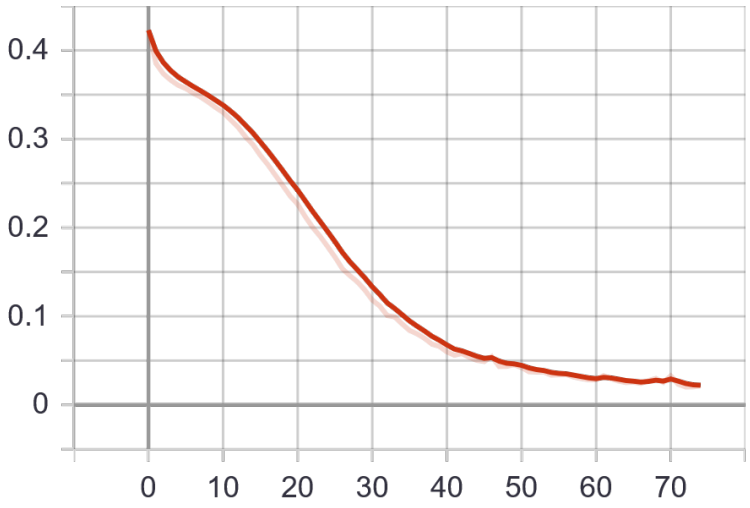


Model2 train auc

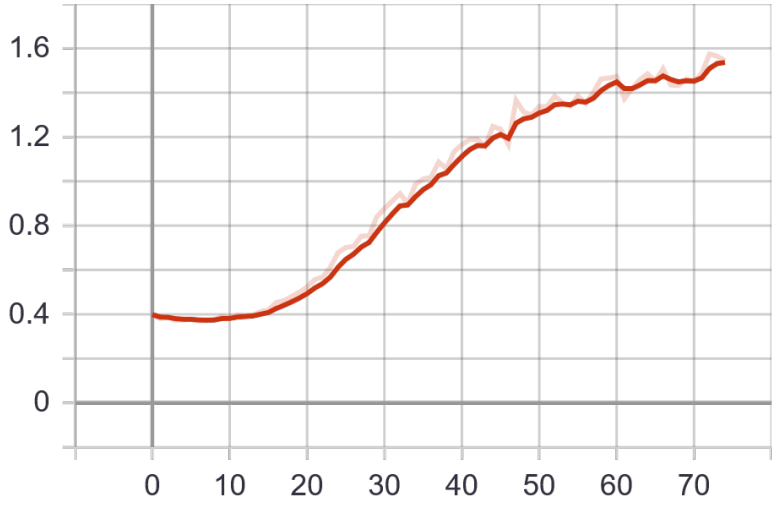


Model2 validation auc

Model2 auc-roc (train -test)

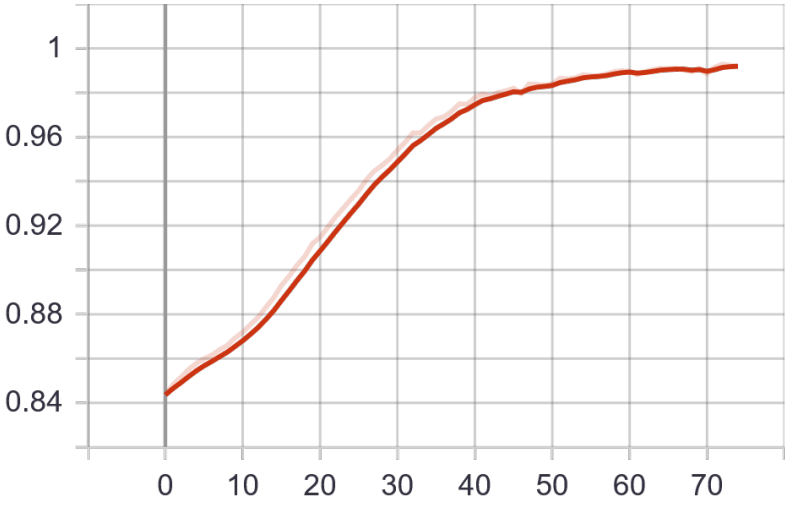


Model3 train loss

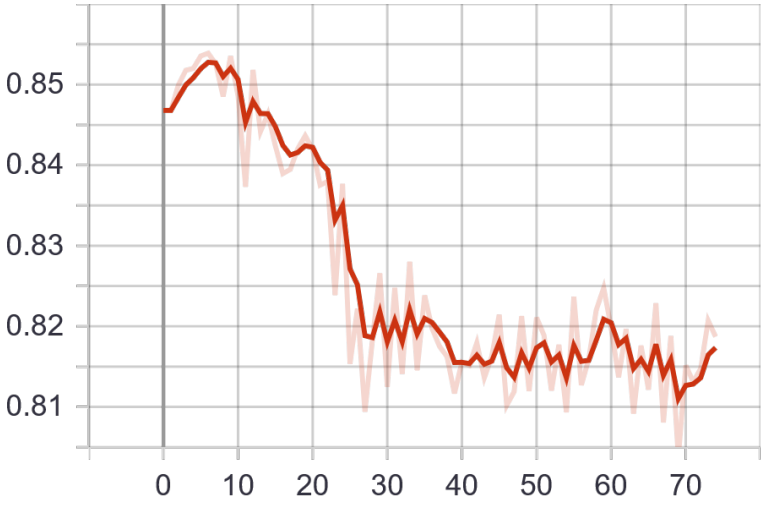


Model3 validation loss

Model3 loss (train -test)

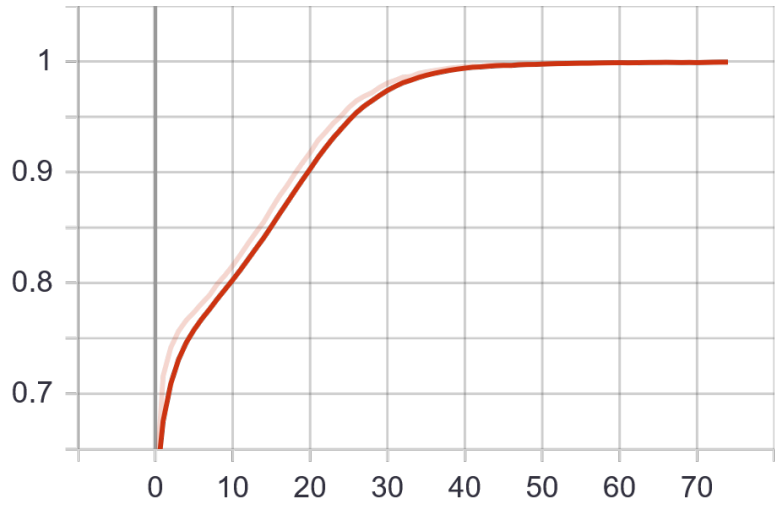


Model3 train accuracy

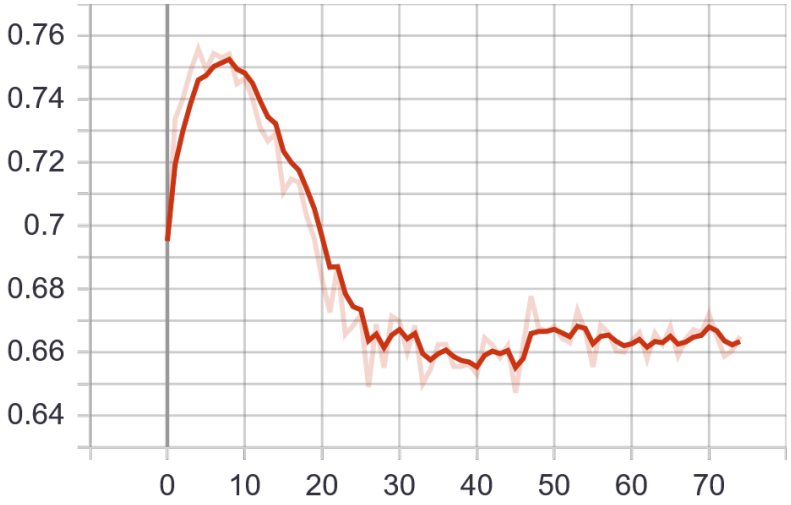


Model3 validation accuracy

Model3 accuracy (train -test)



Model3 train auc



Model3 validation auc

Model3 auc-roc (train -test)

[ ]: