

resnet50_trained

June 3, 2021

```
[1]: from enum import Enum

import torch
import matplotlib.pyplot as plt

from fastai.basics import *
from fastai.vision.all import *

from PIL import ImageFile
```

```
[2]: ImageFile.LOAD_TRUNCATED_IMAGES = True
```

```
[3]: UNDEFINED_LABEL = "undef_lbl"

class SimpleLabel:
    EXPRESSIONISM = "Expressionismo"
    ABSTRACT_ART = "Arte abstrata"
    CUBISM = "Cubismo"
    REALISM = "Realismo"
    RENAISSANCE = "Renascentismo"
    ART_NOUVEAU = "Art Nouveau"
    BAROQUE = "Barroco"
    FAUVISM = "Fauvismo"
    IMPRESSIONISM = "Impressionismo"
    POST_IMPRESSIONISM = "Pos Impressionismo"
    NAIVE_ART_PRIMITIVISM = "Arte Naif"
    PONTILLISM = "Pontilhismo"
    POP_ART = "Pop-Art"
    ROCOCO = "Rococo"
    ROMANTICISM = "Romantismo"
    SYMBOLISM = "Simbolismo"
    UKIYO_E = "Ukiyo-e"

class AtomicLabel:
    ABSTRACT_EXPRESSIONISM = "Expressionismo abstrato"
    ACTION_PAINTING = "Gestualismo"
    MINIMALISM = "Minimalismo"
    COLOR_FIELD_PAINTING = "Color Field"
```

EXPRESSIONISM	= "Expressionismo"
ANALYTICAL_CUBISM	= "Cubismo analitico"
CUBISM	= "Cubismo"
SYNTHETIC_CUBISM	= "Cubismo sintetico"
REALISM	= "Realismo"
CONTEMPORARY_REALISM	= "Realismo contemporaneo"
NEW_REALISM	= "Novo realismo"
EARLY_RENAISSANCE	= "Pré-Renascença"
HIGH_RENAISSANCE	= "Alta Renascença"
MANNERISM_LATE_RENAISSANCE	= "Maneirismo"
NORTHERN_RENAISSANCE	= "Renascimento nórdico"
ART_NOUVEAU_MODERN	= "Art Nouveau"
BAROQUE	= "Barroco"
FAUVISM	= "Fauvismo"
IMPRESSIONISM	= "Impressionismo"
POST_IMPRESSIONISM	= "Pos-Impressionismo"
NAIVE_ART_PRIMITIVISM	= "Arte Naif"
POINTILLISM	= "Pontilhismo"
POP_ART	= "Pop-Art"
ROCOCO	= "Rococo"
ROMANTICISM	= "Romantismo"
SYMBOLISM	= "Simbolismo"
UKIYO_E	= "Ukiyo-e"

```
SIMPLIFIED_LABEL_DICT = {
    "Abstract_Expressionism": SimpleLabel.ABSTRACT_ART,
    "Action_painting": SimpleLabel.ABSTRACT_ART,
    "Minimalism": SimpleLabel.ABSTRACT_ART,
    "Color_Field_Painting": SimpleLabel.ABSTRACT_ART,
    "Expressionism": SimpleLabel.EXPRESSIONISM,
    "Analytical_Cubism": SimpleLabel.CUBISM,
    "Cubism": SimpleLabel.CUBISM,
    "Synthetic_Cubism": SimpleLabel.CUBISM,
    "Realism": SimpleLabel.REALISM,
    "Contemporary_Realism": SimpleLabel.REALISM,
    "New_Realism": SimpleLabel.REALISM,
    "Early_Renaissance": SimpleLabel.RENAISSANCE,
    "High_Renaissance": SimpleLabel.RENAISSANCE,
    "Mannerism_Late_Renaissance": SimpleLabel.RENAISSANCE,
    "Northern_Renaissance": SimpleLabel.RENAISSANCE,
    "Art_Nouveau_Modern": SimpleLabel.ART_NOUVEAU,
    "Baroque": SimpleLabel.BAROQUE,
    "Fauvism": SimpleLabel.FAUVISM,
    "Impressionism": SimpleLabel.IMPRESSIONISM,
    "Post_Impressionism": SimpleLabel.POST_IMPRESSIONISM,
    "Naive_Art_Primitivism": SimpleLabel.NAIVE_ART_PRIMITIVISM,
    "Pointillism": SimpleLabel.PONTILLISM,
```

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    "Pop_Art": SimpleLabel.POP_ART,
    "Rococo": SimpleLabel.ROCOCO,
    "Romanticism": SimpleLabel.ROMANTICISM,
    "Symbolism": SimpleLabel.SYMBOLISM,
    "Ukiyo_e": SimpleLabel.UKIYO_E,
}

COMPLETE_LABEL_DICT = {
    "Abstract_Expressionism": AtomicLabel.ABSTRACT_EXPRESSIONISM,
    "Action_painting": AtomicLabel.ACTION_PAINTING,
    "Minimalism": AtomicLabel.MINIMALISM,
    "Color_Field_Painting": AtomicLabel.COLOR_FIELD_PAINTING,
    "Expressionism": AtomicLabel.EXPRESSIONISM,
    "Analytical_Cubism": AtomicLabel.ANALYTICAL_CUBISM,
    "Cubism": AtomicLabel.CUBISM,
    "Synthetic_Cubism": AtomicLabel.SYNTHETIC_CUBISM,
    "Realism": AtomicLabel.REALISM,
    "Contemporary_Realism": AtomicLabel.CONTEMPORARY_REALISM,
    "New_Realism": AtomicLabel.NEW_REALISM,
    "Early_Renaissance": AtomicLabel.EARLY_RENAISSANCE,
    "High_Renaissance": AtomicLabel.HIGH_RENAISSANCE,
    "Mannerism_Late_Renaissance": AtomicLabel.MANNERISM_LATE_RENAISSANCE,
    "Northern_Renaissance": AtomicLabel.NORTHERN_RENAISSANCE,
    "Art_Nouveau_Modern": AtomicLabel.ART_NOUVEAU_MODERN,
    "Baroque": AtomicLabel.BAROQUE,
    "Fauvism": AtomicLabel.FAUVISM,
    "Impressionism": AtomicLabel.IMPRESSIONISM,
    "Post_Impressionism": AtomicLabel.POST_IMPRESSIONISM,
    "Naive_Art_Primitivism": AtomicLabel.NAIVE_ART_PRIMITIVISM,
    "Pointillism": AtomicLabel.POINTILLISM,
    "Pop_Art": AtomicLabel.POP_ART,
    "Rococo": AtomicLabel.ROCOCO,
    "Romanticism": AtomicLabel.ROMANTICISM,
    "Symbolism": AtomicLabel.SYMBOLISM,
    "Ukiyo_e": AtomicLabel.UKIYO_E,
}

def _val_or_undef(dict, key):
    if (key in dict):
        return dict[key]

    return UNDEFINED_LABEL

def label_simple(parent_dir):
    return _val_or_undef(SIMPLIFIED_LABEL_DICT, parent_dir)

def label_atomic(parent_dir):

```

```
_val_or_undef(COMPLETE_LABEL_DICT, parent_dir)
```

```
[4]: DATASET_ROOT = "/home/buenogabriel1999_gmail_com/wikiart/wikiart"
      LABEL_FUNC = label_simple

      def label_func(fname):
          return LABEL_FUNC(parent_label(fname))

[5]: dirs = [path for path in os.listdir(DATASET_ROOT) if path.is_dir()]
      imgs = [(file.path, LABEL_FUNC(dir.name)) for dir in dirs for file in os.
               ↳scandir(dir.path)]

      imgs_by_label = {}

      for (path, label) in imgs:
          if (label not in imgs_by_label):
              imgs_by_label[label] = []

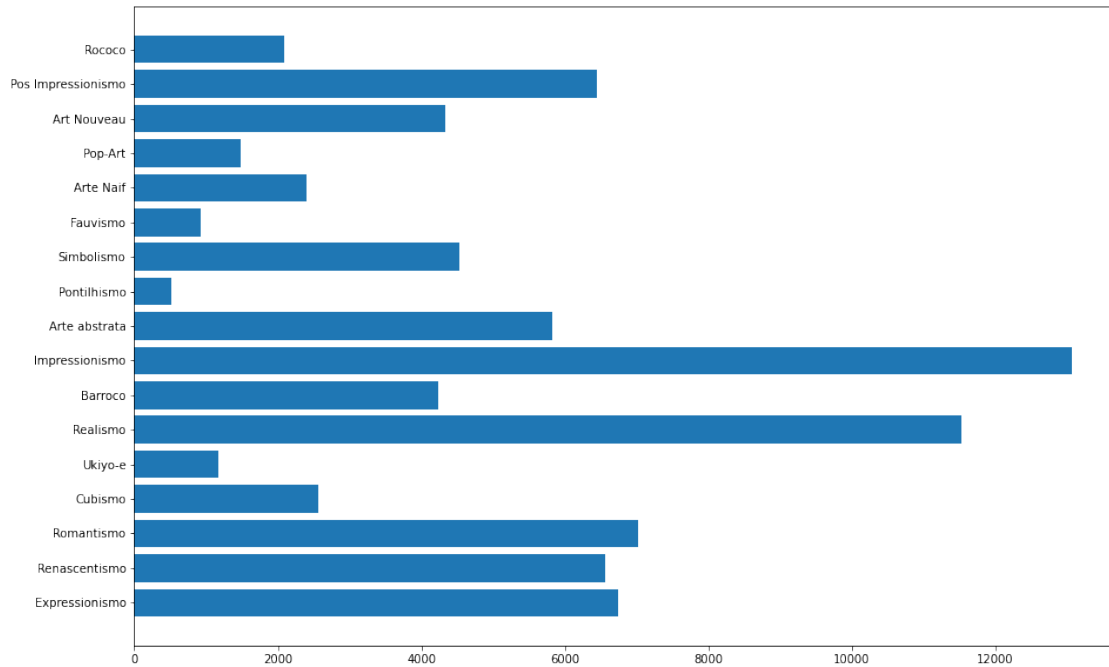
          imgs_by_label[label].append((path, label))

      x = [lbl for lbl in imgs_by_label]
      y = [len(imgs_by_label[lbl]) for lbl in imgs_by_label]

      print(f"Total: {sum(y)}")

      f, ax = plt.subplots(1, 1, figsize=(15, 10))
      ax.barh(x, y)
      plt.show()
```

Total: 81446



```
[6]: dblock = DataBlock(
    blocks      = (ImageBlock, CategoryBlock),
    get_items   = get_image_files,
    get_y       = label_func,
    splitter    = RandomSubsetSplitter(.8, .2),
    item_tfms   = RandomResizedCrop(128, min_scale=.35),
    batch_tfms  = Normalize.from_stats(*imagenet_stats)
)

dloader = dblock.dataloaders(DATASET_ROOT, bs=32, num_workers=4)
```

```
[7]: dloader.show_batch()
```

Art Nouveau



Expressionismo



Arte abstracta



Impressionismo



Renascentismo



Romantismo



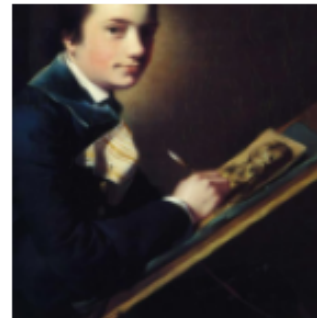
Realismo



Renascentismo



Barroco



```
[8]: MODELS_FOLDER = "/home/buenogabriel1999_gmail_com/models/"  
  
resnet50_learner = load_learner(MODELS_FOLDER + "resnet50.pkl", cpu=False)  
  
resnet50_learner.dls = dloader
```

```
[9]: resnet50_learner.validate()  
  
<IPython.core.display.HTML object>
```

```
[9]: (#2) [2.0453383922576904,0.6632696986198425]
```

```
[10]: resnet50_learner.show_results()
```

<IPython.core.display.HTML object>



```
[11]: r50_classif_interpretation = ClassificationInterpretation.  
      ↪from_learner(resnet50_learner)
```

<IPython.core.display.HTML object>

```
[12]: r50_classif_interpretation.plot_confusion_matrix(figsize=(10,10))
```



```
[13]: r50_classif_interpretation.plot_top_losses(16, nrows=4, figsize=(20,20))
```


Prediction/Actual/Loss/Probability

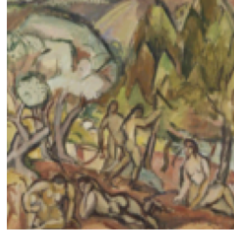
Arte astrata/Rococo / 10.18 / 0.79



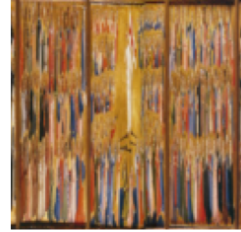
Arte astrata/Renascentismo / 9.65 / 0.97



Arte astrata/Fauvismo / 9.55 / 0.75



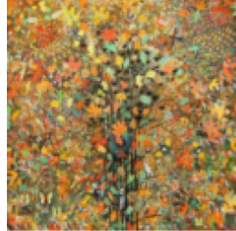
Arte astrata/Renascentismo / 9.45 / 0.85



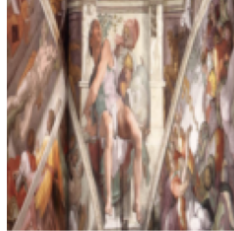
Arte Naif/Pontilhismo / 9.30 / 0.36



Arte astrata/Fauvismo / 9.26 / 0.84



Arte astrata/Renascentismo / 9.11 / 0.99



Arte astrata/Fauvismo / 9.02 / 0.90



Arte astrata/Renascentismo / 8.98 / 0.97



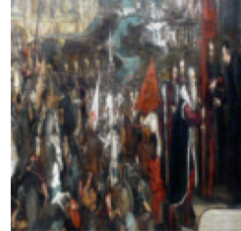
Simbolismo/Ukiyo-e / 8.77 / 0.38



Realismo/Pontilhismo / 8.51 / 0.40



Arte astrata/Renascentismo / 8.46 / 0.96



Impressionismo/Pontilhismo / 8.40 / 0.41



Simbolismo/Pontilhismo / 8.34 / 0.88



Simbolismo/Pontilhismo / 8.28 / 0.55



Simbolismo/Fauvismo / 8.25 / 0.44

