Computer Vision Pretrained Models

What is pre-trained Model?

A pre-trained model is a model created by some one else to solve a similar problem. Instead of building a model from scratch to solve a similar problem, we can use the model trained on other problem as a starting point. A pre-trained model may not be 100% accurate in your application.

For example, if you want to build a self learning car. You can spend years to build a decent image recognition algorithm from scratch or you can take inception model (a pre-trained model) from Google which was built on ImageNet data to identify images in those pictures.

Other Pre-trained Models

- NLP Pre-trained Models.
- Audio and Speech Pre-trained Models

Framework

- Tensorflow
- Keras

- PyTorch
- Caffe
- MXNet

Model visualization

You can see visualizations of each model's network architecture by using Netron.

Tensorflow

Model Name	Description	Framework
ObjectDetection	Localizing and identifying multiple objects in a single image.	Tensorflow
Mask R-CNN	The model generates bounding boxes and segmentation masks for each instance of an object in the image. It's based on Feature Pyramid Network (FPN) and a ResNet101 backbone.	Tensorflow
Faster-RCNN	This is an experimental Tensorflow implementation of Faster RCNN - a convnet for object detection with a region proposal network.	Tensorflow
YOLO TensorFlow	This is tensorflow implementation of the YOLO:Real-Time Object Detection.	Tensorflow
YOLO TensorFlow ++	TensorFlow implementation of 'YOLO: Real-Time Object Detection', with training and an actual support for real-time running on mobile devices.	Tensorflow
MobileNet	MobileNets trade off between latency, size and accuracy while comparing favorably with popular models from the literature.	Tensorflow
DeepLab	Deep labeling for semantic image segmentation.	Tensorflow
Colornet	Neural Network to colorize grayscale images.	Tensorflow
SRGAN	Photo-Realistic Single Image Super-Resolution Using a Generative Adversarial Network.	Tensorflow
DeepOSM	Train TensorFlow neural nets with OpenStreetMap features and satellite imagery.	Tensorflow

Model Name	Description	Framework
Domain Transfer Network	Implementation of Unsupervised Cross-Domain Image Generation.	Tensorflow
Show, Attend and Tell	Attention Based Image Caption Generator.	Tensorflow
android-yolo	Real-time object detection on Android using the YOLO network, powered by TensorFlow.	Tensorflow
DCSCN Super Resolution	This is a tensorflow implementation of "Fast and Accurate Image Super Resolution by Deep CNN with Skip Connection and Network in Network", a deep learning based Single-Image Super-Resolution (SISR) model.	Tensorflow
GAN-CLS	This is an experimental tensorflow implementation of synthesizing images.	Tensorflow
U-Net	For Brain Tumor Segmentation.	Tensorflow
Improved CycleGAN	Unpaired Image to Image Translation.	Tensorflow
Im2txt	Image-to-text neural network for image captioning.	Tensorflow
Street	Identify the name of a street (in France) from an image using a Deep RNN.	Tensorflow
SLIM	Image classification models in TF-Slim.	Tensorflow
DELF	Deep local features for image matching and retrieval.	Tensorflow
Compression	Compressing and decompressing images using a pre-trained Residual GRU network.	Tensorflow
AttentionOCR	A model for real-world image text extraction.	Tensorflow

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Keras

Model Name	Description	Framework

Model Name	Description	Framework
Mask R-CNN	The model generates bounding boxes and segmentation masks for each instance of an object in the image. It's based on Feature Pyramid Network (FPN) and a ResNet101 backbone.	Keras
VGG16	Very Deep Convolutional Networks for Large-Scale Image Recognition.	Keras
VGG19	Very Deep Convolutional Networks for Large-Scale Image Recognition.	Keras
ResNet	Deep Residual Learning for Image Recognition.	Keras
Image analogies	Generate image analogies using neural matching and blending.	Keras
Popular Image Segmentation Models	Implementation of Segnet, FCN, UNet and other models in Keras.	Keras
Ultrasound nerve segmentation	This tutorial shows how to use Keras library to build deep neural network for ultrasound image nerve segmentation.	Keras
DeepMask object segmentation	This is a Keras-based Python implementation of DeepMask- a complex deep neural network for learning object segmentation masks.	Keras
Monolingual and Multilingual Image Captioning	This is the source code that accompanies Multilingual Image Description with Neural Sequence Models.	Keras
pix2pix	Keras implementation of Image-to-Image Translation with Conditional Adversarial Networks by Phillip Isola, Jun-Yan Zhu, Tinghui Zhou, Alexei A.	Keras
Colorful Image colorization	B&W to color.	Keras
CycleGAN	Implementation of *Unpaired Image-to-Image Translation using Cycle-Consistent Adversarial Networks*.	Keras
DualGAN	Implementation of *DualGAN: Unsupervised Dual Learning for Image-to-Image Translation*.	Keras

Model Name	Description	Framework
Super-Resolution GAN	Implementation of *Photo-Realistic Single Image Super-Resolution Using a Generative Adversarial Network*.	`Keras`

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PyTorch

Model Name	Description	Framework
FastPhotoStyle	A Closed-form Solution to Photorealistic Image Stylization.	`PyTorch`
pytorch-CycleGAN-and-pix2pix	A Closed-form Solution to Photorealistic Image Stylization.	`PyTorch`
maskrcnn-benchmark	Fast, modular reference implementation of Instance Segmentation and Object Detection algorithms in PyTorch.	`PyTorch`
deep-image-prior	Image restoration with neural networks but without learning.	`PyTorch`
StarGAN	StarGAN: Unified Generative Adversarial Networks for Multi-Domain Image-to-Image Translation.	`PyTorch`
faster-rcnn.pytorch	This project is a faster faster R-CNN implementation, aimed to accelerating the training of faster R-CNN object detection models.	`PyTorch`
pix2pixHD	Synthesizing and manipulating 2048x1024 images with conditional GANs.	`PyTorch`
Augmentor	Image augmentation library in Python for machine learning.	`PyTorch`
albumentations	Fast image augmentation library.	`PyTorch`
Deep Video Analytics	Deep Video Analytics is a platform for indexing and extracting information from videos and images	`PyTorch`

Model Name	Description	Framework
semantic-segmentation-pytorch	Pytorch implementation for Semantic Segmentation/Scene Parsing on MIT ADE20K dataset.	PyTorch
An End-to-End Trainable Neural Network for Image-based Sequence Recognition	This software implements the Convolutional Recurrent Neural Network (CRNN), a combination of CNN, RNN and CTC loss for image-based sequence recognition tasks, such as scene text recognition and OCR.	PyTorch
UNIT	PyTorch Implementation of our Coupled VAE-GAN algorithm for Unsupervised Image-to-Image Translation.	PyTorch
Neural Sequence labeling model	Sequence labeling models are quite popular in many NLP tasks, such as Named Entity Recognition (NER), part-of-speech (POS) tagging and word segmentation.	PyTorch
faster rcnn	This is a PyTorch implementation of Faster RCNN. This project is mainly based on py-faster-rcnn and TFFRCNN. For details about R-CNN please refer to the paper Faster R-CNN: Towards Real-Time Object Detection with Region Proposal Networks by Shaoqing Ren, Kaiming He, Ross Girshick, Jian Sun.	PyTorch
pytorch-semantic-segmentation	PyTorch for Semantic Segmentation.	PyTorch
EDSR-PyTorch	PyTorch version of the paper 'Enhanced Deep Residual Networks for Single Image Super-Resolution'.	PyTorch
image-classification-mobile	Collection of classification models pretrained on the ImageNet-1K.	PyTorch
FaderNetworks	Fader Networks: Manipulating Images by Sliding Attributes - NIPS 2017.	PyTorch
neuraltalk2-pytorch	Image captioning model in pytorch (finetunable cnn in branch with_finetune).	PyTorch

Model Name	Description	Framework
RandWireNN	Implementation of: "Exploring Randomly Wired Neural Networks for Image Recognition".	PyTorch
stackGAN-v2	Pytorch implementation for reproducing StackGAN_v2 results in the paper StackGAN++.	PyTorch
Detectron models for Object Detection	This code allows to use some of the Detectron models for object detection from Facebook AI Research with PyTorch.	PyTorch
DEXTR-PyTorch	This paper explores the use of extreme points in an object (left-most, right-most, top, bottom pixels) as input to obtain precise object segmentation for images and videos.	PyTorch
pointnet.pytorch	Pytorch implementation for "PointNet: Deep Learning on Point Sets for 3D Classification and Segmentation.	PyTorch
self-critical.pytorch	This repository includes the unofficial implementation Self-critical Sequence Training for Image Captioning and Bottom-Up and Top-Down Attention for Image Captioning and Visual Question Answering.	PyTorch
vnet.pytorch	A Pytorch implementation for V-Net: Fully Convolutional Neural Networks for Volumetric Medical Image Segmentation.	PyTorch
piwise	Pixel-wise segmentation on VOC2012 dataset using pytorch.	PyTorch
pspnet-pytorch	PyTorch implementation of PSPNet segmentation network.	PyTorch
pytorch-SRResNet	Pytorch implementation for Photo-Realistic Single Image Super-Resolution Using a Generative Adversarial Network.	PyTorch
PNASNet.pytorch	PyTorch implementation of PNASNet-5 on ImageNet.	PyTorch

Model Name	Description	Framework
img_classification_pk_pytorch	Quickly comparing your image classification models with the state-of-the-art models.	PyTorch
Deep Neural Networks are Easily Fooled	High Confidence Predictions for Unrecognizable Images.	PyTorch
pix2pix-pytorch	PyTorch implementation of "Image-to-Image Translation Using Conditional Adversarial Networks".	PyTorch
NVIDIA/semantic-segmentation	A PyTorch Implementation of Improving Semantic Segmentation via Video Propagation and Label Relaxation, In CVPR2019.	PyTorch
Neural-IMage-Assessment	A PyTorch Implementation of Neural IMage Assessment.	PyTorch
torchxrayvision	Pretrained models for chest X-ray (CXR) pathology predictions. Medical, Healthcare, Radiology	PyTorch

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Caffe

Model Name	Description	Framework
OpenPose	OpenPose represents the first real-time multi-person system to jointly detect human body, hand, and facial keypoints (in total 130 keypoints) on single images.	Caffe
Fully Convolutional Networks for Semantic Segmentation	Fully Convolutional Models for Semantic Segmentation.	Caffe
Colorful Image Colorization	Colorful Image Colorization.	Caffe
R-FCN	R-FCN: Object Detection via Region-based Fully Convolutional Networks.	Caffe

Model Name	Description	Framework
cnn-vis	Inspired by Google's recent Inceptionism blog post, cnn-vis is an open-source tool that lets you use convolutional neural networks to generate images.	`Caffe`
DeconvNet	Learning Deconvolution Network for Semantic Segmentation.	`Caffe`

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MXNet

Model Name	Description	Framework
Faster RCNN	Region Proposal Network solves object detection as a regression problem.	`MXNet`
SSD	SSD is an unified framework for object detection with a single network.	`MXNet`
Faster RCNN+Focal Loss	The code is unofficial version for focal loss for Dense Object Detection.	`MXNet`
CNN-LSTM-CTC	I realize three different models for text recognition, and all of them consist of CTC loss layer to realize no segmentation for text images.	`MXNet`
Faster_RCNN_for_DOTA	This is the official repo of paper *DOTA: A Large-scale Dataset for Object Detection in Aerial Images*.	`MXNet`
RetinaNet	Focal loss for Dense Object Detection.	`MXNet`
MobileNetV2	This is a MXNet implementation of MobileNetV2 architecture as described in the paper *Inverted Residuals and Linear Bottlenecks: Mobile Networks for Classification, Detection and Segmentation*.	`MXNet`
neuron-selectivity-transfer	This code is a re-implementation of the imagenet classification experiments in the paper *Like What You Like: Knowledge Distill via Neuron Selectivity Transfer*.	`MXNet`

Model Name	Description	Framework
MobileNetV2	This is a Gluon implementation of MobileNetV2 architecture as described in the paper *Inverted Residuals and Linear Bottlenecks: Mobile Networks for Classification, Detection and Segmentation*.	`MXNet`
sparse-structure-selection	This code is a re-implementation of the imagenet classification experiments in the paper *Data-Driven Sparse Structure Selection for Deep Neural Networks*.	`MXNet`
FastPhotoStyle	A Closed-form Solution to Photorealistic Image Stylization.	`MXNet`

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Contributions

Your contributions are always welcome!! Please have a look at `contributing.md`

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