TABLE I
A SUMMARY OF IMAGE DATASETS

Dataset	Train Size	Valid Size	Test Size	Description	Link
CIFAR-10	50,000	-	10,000	32x32 RBG images with 10 classes	http://www.cs.toronto.edu/ kriz/index.html
CIFAR-100	50,000	-	10,000	32x32 RBG images with 100 classes	http://www.cs.toronto.edu/ kriz/index.html
MNIST	60,000	-	10,000	28x28 gray handwritten digits	http://yann.lecun.com/exdb/mnist/
ISLVRC2012	1,281,167	50,000	100,000	images with 1000 categories	http://www.image-net.org/download-imageurls
Semeion Handwritten	1593	-	-	16x16 gray handwritten digits	https://archive.ics.uci.edu/ml/datasets/ Semeion+Handwritten+Digit
Fashion-MNIST	60,000	-	10,000	28x28 gray images with 10 classes	https://github.com/zalandoresearch/fashion-mnist
STL-10	5,000	-	8,000	96x96 RBG images with 10 classes and extra 100,000 images without label	https://cs.stanford.edu/ acoates/stl10/
CalTech101	9146	-	-	300x200 RBG images with 101 classes	http://www.vision.caltech.edu/Image_Datasets/Caltech101/
SVHN	73,257	-	26,032	32x32 RBG images for house numbers	http://ufldl.stanford.edu/housenumbers/
CK+	593	-	-	Facial expressions image sequences	http://www.pitt.edu/ emotion/ck-spread.htm
SFEW 2.0	958	436	372	Dynamic temporal facial expressions	https://cs.anu.edu.au/few/
JAFFE	213	-	-	256x256 gray images for facial expressions	https://zenodo.org/record/3451524#.YGmFd-gzaUl
CelebA	202,599	-	-	178x218 image for face attributes	http://mmlab.ie.cuhk.edu.hk/projects/CelebA.html
LIDC-IDRI	244,527	-	-	512x512 clinical thoracic CT	https://wiki.cancerimagingarchive.net/display/Public/ LIDC-IDRI
Luna16	888	-	-	512x512 clinical thoracic CT	https://luna16.grand-challenge.org/
Cars	8,144	-	8,041	Images for 196 classes cars	https://ai.stanford.edu/ jkrause/cars/car_dataset.html

TABLE II
A SUMMARY OF TIME SERIES DATASETS

Dataset	Length	Description	Link
Mackey-Glass	self-defined	generates a Mackey-Glass time series using the 4th order Runge-Kutta method	https://www.mathworks.com/matlabcentral/fileexchange/ 24390-mackey-glass-time-series-generator
Sunspot	74235	Daily total sunspot number 1/1/1818 to now	http://sidc.oma.be/silso/datafiles
California Housing	20640	the house prices in California from 1990	https://www.dcc.fc.up.pt/ ltorgo/Regression/cal_housing.html
DJIA	1990	daily news for stock market	https://www.kaggle.com/aaron7sun/stocknews
WGS30YR	2303	Treasury Constant Maturity Rate from 1977 to now	https://fred.stlouisfed.org/series/WGS30YR

TABLE III
A SUMMARY OF OTHER DATASETS

Dataset	Type	Description	Link
PTB	Text	10K words in the vocabulary: 929k Training words, 73K validation words, and 82K test words	http://www.fit.vutbr.cz/ imikolov/rnnlm/simple-examples.tgz
UCF50	Clip	6,676 clips for 50 human action categories and a minimum of 100 clips for each action class	https://www.crcv.ucf.edu/data/UCF50.php
Kinetics	Clip	650,000 clips cover 700 human action classes and each action class has at least 700 video clips	https://deepmind.com/research/open-source/kinetics
Charades	Clip	9848 clips with 66,500 temporal annotations for 157 action classes	https://prior.allenai.org/projects/charades
HMDB	Clip	6849 clips for 51 action categories and each containing a minimum of 101 clips	https://serre-lab.clps.brown.edu/resource/ hmdb-a-large-human-motion-database/
MOMENTS IN TIME	Clip	802,264 training clips, 33,900 validation clips, 67,800 test clips and 3 seconds for each clip including an action	http://moments.csail.mit.edu/

TABLE IV
A SUMMARY OF OPEN-SOURCE IMPLEMENTATIONS

Project	Description	Link
Deepswarm [78]	NAS for CNN by ACO	https://github.com/Pattio/DeepSwarm
RE-NAS [68]	NAS for CNN by RL and EA	https://github.com/yukang2017/RENAS
Genetic-CNN [59]	Opimise CNN's connections by GA	https://github.com/aqibsaeed/Genetic-CNN
EvoCNN [52]	NAS for CNN	https://github.com/yn-sun/evocnn
DENSER [55]	NAS for CNN by GA	http://github.com/fillassuncao/denser-models
AmoebaNet-D [69]	NAS for large scale CNN	https://github.com/tensorflow/tpu/tree/master/models/official/amoeba_net
EvoDeep [54]	NAS for CNN	https://github.com/alexMyG/EvoDeep
CGP-CNN [62]	NAS for CNN by CGP	https://github.com/sg-nm/cgp-cnn
PSOCNN [80]	NAS for CNN by PSO	https://github.com/feferna/psoCNN
CMA-ES-DNN [132]	NAS for CNN by ES	http://sites.google.com/site/cmaesfordnn
EACNN [72]	NAS for cell-based CNN	https://github.com/yn-sun/ea-cnn
NSGA-Net [60]	NAS for CNN by MOEA	https://github.com/ianwhale/nsga-net
ECAE [61]	NAS for SAE	https://github.com/sg-nm/Evolutionary-Autoencoders
EvoCAE [57]	NAS for SAE by PSO	https://github.com/yn-sun/evocae
One-Shot [83]	NAS under one-shot model	https://github.com/megvii-model/SinglePathOneShot
DetNAS [17]	NAS under one-shot model	https://github.com/megvii-model/DetNAS
CMTL-PRNN [23]	NAS for RNN for Multi-task	https://github.com/rohitash-chandra/CMTL-PRNN
CERL [121]	NAS for policy in RL by EA	https://github.com/IntelAI/cerl
EGAN [208]	Train GAN by EA	https://github.com/WANG-Chaoyue/EvolutionaryGAN
safemutations [156]	Train DNN/RNN by EA	https://github.com/uber-research/safemutations
CC-RNN [21]	Train RNN by Co-EA	https://github.com/rohitash-chandra/CooperativeCoevolution-RNN
EA-LSTM [25]	Train attention layer in LSTM by EA	https://github.com/LiYouru0228/EA-LSTM
LEEA [30]	Train RL policy by EA	http://eplex.cs.ucf.edu/software/LEEAv1-PublicRelease.zip
Canonical ES [29]	Train RL policy by ES	https://github.com/PatrykChrabaszcz/Canonical_ES_Atari
ERL [39]	Train RL policy by EA	https://github.com/ShawK91/erl_paper_nips18
CEM-RL [47]	Train RL policy by ES	https://github.com/apourchot/CEM-RL
DGA [27]	Train RL policy by GA	https://github.com/uber-research/deep-neuroevolution
NS-ES [155]	Train RL policy by ES	https://github.com/uber-research/deep-neuroevolution
SET [108]	Compress and train DNN	https://github.com/dcmocanu/sparse-evolutionary-artificial-neural-networks
MetaPruning [192]	Compress DNN	https://github.com/liuzechun/MetaPruning
GAN-pruning [209]	Compress GAN by CoEA	https://github.com/huawei-noah/GAN-pruning
EUDNN [37]	Initialize DNN's weights by EA	https://github.com/yn-sun/eudnn
EPG [210]	loss function optimization	http://github.com/openai/EPG