#include "network.h"

#include "utils.h"

#include "parser.h"

void train\_writing(char \*cfgfile, char \*weightfile)

{

char\* backup\_directory = "backup/";

srand(time(0));

float avg\_loss = -1;

char \*base = basecfg(cfgfile);

printf("%s\n", base);

network net = parse\_network\_cfg(cfgfile);

if(weightfile){

load\_weights(&net, weightfile);

}

printf("Learning Rate: %g, Momentum: %g, Decay: %g\n", net.learning\_rate, net.momentum, net.decay);

int imgs = net.batch\*net.subdivisions;

list \*plist = get\_paths("figures.list");

char \*\*paths = (char \*\*)list\_to\_array(plist);

clock\_t time;

int N = plist->size;

printf("N: %d\n", N);

image out = get\_network\_image(net);

data train, buffer;

load\_args args = {0};

args.w = net.w;

args.h = net.h;

args.out\_w = out.w;

args.out\_h = out.h;

args.paths = paths;

args.n = imgs;

args.m = N;

args.d = &buffer;

args.type = WRITING\_DATA;

pthread\_t load\_thread = load\_data\_in\_thread(args);

int epoch = (\*net.seen)/N;

while(get\_current\_batch(net) < net.max\_batches || net.max\_batches == 0){

time=clock();

pthread\_join(load\_thread, 0);

train = buffer;

load\_thread = load\_data\_in\_thread(args);

printf("Loaded %lf seconds\n",sec(clock()-time));

time=clock();

float loss = train\_network(net, train);

/\*

image pred = float\_to\_image(64, 64, 1, out);

print\_image(pred);

\*/

/\*

image im = float\_to\_image(256, 256, 3, train.X.vals[0]);

image lab = float\_to\_image(64, 64, 1, train.y.vals[0]);

image pred = float\_to\_image(64, 64, 1, out);

show\_image(im, "image");

show\_image(lab, "label");

print\_image(lab);

show\_image(pred, "pred");

cvWaitKey(0);

\*/

if(avg\_loss == -1) avg\_loss = loss;

avg\_loss = avg\_loss\*.9 + loss\*.1;

printf("%d, %.3f: %f, %f avg, %f rate, %lf seconds, %ld images\n", get\_current\_batch(net), (float)(\*net.seen)/N, loss, avg\_loss, get\_current\_rate(net), sec(clock()-time), \*net.seen);

free\_data(train);

if(get\_current\_batch(net)%100 == 0){

char buff[256];

sprintf(buff, "%s/%s\_batch\_%d.weights", backup\_directory, base, get\_current\_batch(net));

save\_weights(net, buff);

}

if(\*net.seen/N > epoch){

epoch = \*net.seen/N;

char buff[256];

sprintf(buff, "%s/%s\_%d.weights",backup\_directory,base, epoch);

save\_weights(net, buff);

}

}

}

void test\_writing(char \*cfgfile, char \*weightfile, char \*filename)

{

network net = parse\_network\_cfg(cfgfile);

if(weightfile){

load\_weights(&net, weightfile);

}

set\_batch\_network(&net, 1);

srand(2222222);

clock\_t time;

char buff[256];

char \*input = buff;

while(1){

if(filename){

strncpy(input, filename, 256);

}else{

printf("Enter Image Path: ");

fflush(stdout);

input = fgets(input, 256, stdin);

if(!input) return;

strtok(input, "\n");

}

image im = load\_image\_color(input, 0, 0);

resize\_network(&net, im.w, im.h);

printf("%d %d %d\n", im.h, im.w, im.c);

float \*X = im.data;

time=clock();

network\_predict(net, X);

printf("%s: Predicted in %f seconds.\n", input, sec(clock()-time));

image pred = get\_network\_image(net);

image upsampled = resize\_image(pred, im.w, im.h);

image thresh = threshold\_image(upsampled, .5);

pred = thresh;

show\_image(pred, "prediction");

show\_image(im, "orig");

wait\_until\_press\_key\_cv();

destroy\_all\_windows\_cv();

free\_image(upsampled);

free\_image(thresh);

free\_image(im);

if (filename) break;

}

}

void run\_writing(int argc, char \*\*argv)

{

if(argc < 4){

fprintf(stderr, "usage: %s %s [train/test/valid] [cfg] [weights (optional)]\n", argv[0], argv[1]);

return;

}

char \*cfg = argv[3];

char \*weights = (argc > 4) ? argv[4] : 0;

char \*filename = (argc > 5) ? argv[5] : 0;

if(0==strcmp(argv[2], "train")) train\_writing(cfg, weights);

else if(0==strcmp(argv[2], "test")) test\_writing(cfg, weights, filename);

}