Context-Aware Crowd Counting

Tushaar Ranganathan

October 2024

⌗https://github.com/Tushaar-R/Context-Aware-Crowd-Counting

1 Dataset Descriptions

1.1 ShanghaiTech Part A Dataset

- Consists of 482 images, 300 for training and 182 for testing

- Consists of high density crowd scenes

1.2 ShanghaiTech Part B Dataset

- Consists of 716 images, 400 for training and 316 for testing

- Consists of relatively low density crowd scenes

1.3 Pre-processing

- Ground truth density maps contain dot annotations which represents the location of a person's head.

- The ground truth density maps are pre-processed by centering a Gaussian distribution on each annotated point, creating a smooth, continuous representation of crowd density where intensity reflects the concentration of people.

2 Results

'Research Paper' shows the results from the research paper. 'My implementation' shows the results obtained from running my implementation of the research paper. The other models were the pre-existing models which the research paper aimed to out perform.

2.1 ShanghaiTech Part A Dataset

Model	MAE	RMSE
Zhang et al. [41]	181.8	277.7
MCNN [42]	110.2	173.2
Switch-CNN [31]	90.4	135.0
CP-CNN [36]	73.6	106.4
ACSCP [32]	75.7	102.7
Liu et al. [24]	73.6	112.0
D-ConvNet [33]	73.5	112.3
IG-CNN [30]	72.5	118.2
ic-CNN [28]	68.5	116.2
CSRNet [19]	68.2	115.0
SANet [5]	67.0	104.5
Research Paper	62.3	100.0
My implemention	66.7	100.3

Table 1: MAE and RMSE for Part A

2.2 SHANGHAITECH PART B DATASET

Model	MAE	RMSE
Zhang et al. [41]	32.0	49.8
MCNN [42]	26.4	41.3
Switch-CNN [31]	21.6	33.4
CP-CNN [36]	20.1	30.1
ACSCP [32]	17.2	27.4
Liu et al. [24]	13.7	21.4
D-ConvNet [33]	18.7	26.0
IG-CNN [30]	13.6	21.1
ic-CNN [28]	10.7	16.0
CSRNet [19]	10.6	16.0
SANet [5]	8.4	13.6
Research Paper	7.8	12.2
My implementation	13.1	21.1

Table 2: MAE and RMSE for Part B

Due to computation restraints of running on Kaggle, I was able to run the model on Part A for 360 epochs and on Part B for 125 epochs only whereas the research paper results were obtained by running the model for 1000 epochs.
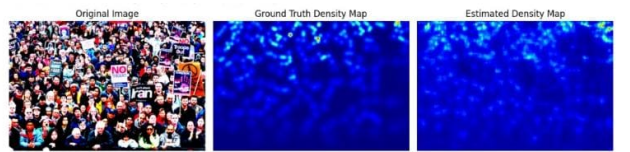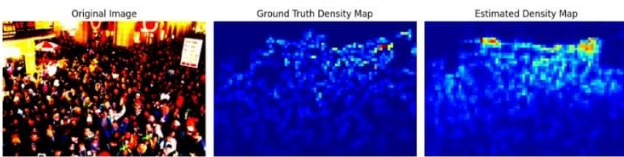
The result on Part B show signfìcant improvement on further running as can be shown from the following table:

Part B	MAE	RMSE
100 epochs	20.53189	28.52143
125 epochs	13.10236	21.13210

Table 3: ShanghaiTech Part B evaluation after 100 and 125 epochs

3 ESTIMATED GROUND TRUTH DENSITY MAP

3.1 SHANGHAITECH PART A DATASET

3.2 ShanghaiTech Part B Dataset