Report

In all the experiments I tried different hyper parameters until I reached good results. The hyper parameters I played with were: the batch size, learning rate, momentum (in case I used momentum), optimizer, filter sizes, number of filters, paddings, step size of the filters and dropout probabilities.

My model:

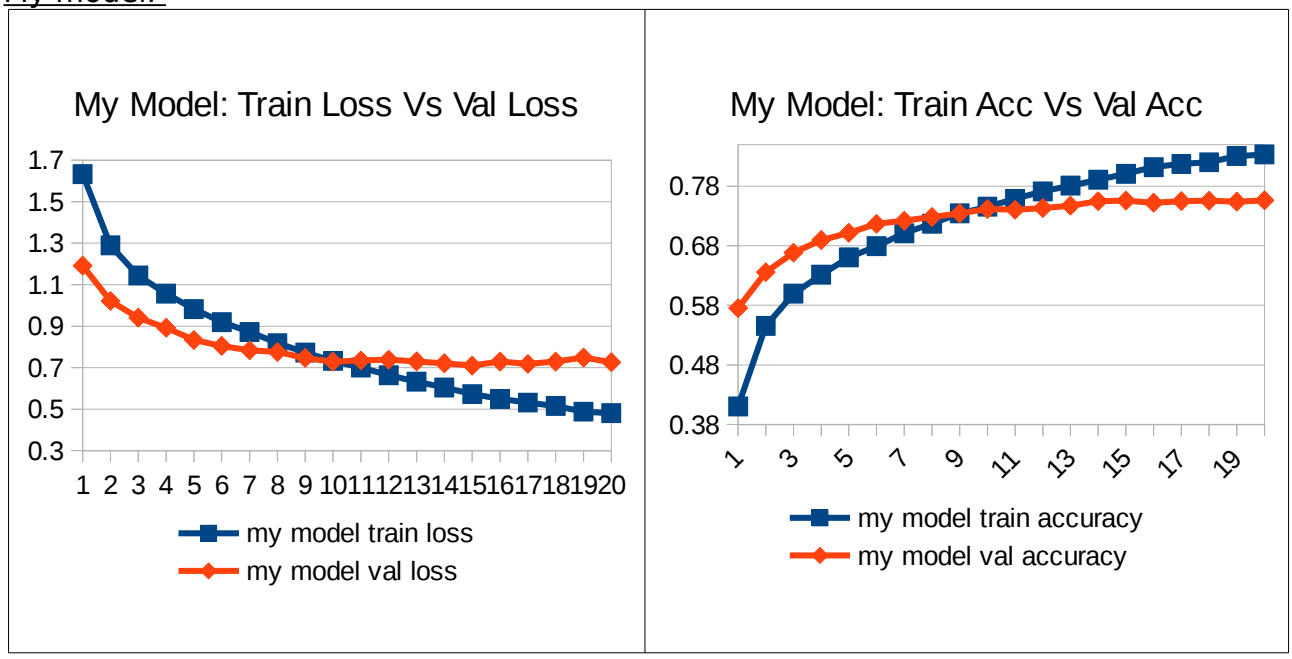

Table 1: my model train vs validation loss (on the left) and accuracy (on the right)

Loss – train: 0.48, validation: 0.72, test: 0.73
Accuracy – train: 83%, validation: 75.6%, test: 76%
Parameters –
Batch size: 64,
Learning rate: 0.001 with Adam optimizer,
dropout: on conv layers – 0.2 and on FC layers – 0.4,
FC layer sizes: 150 and 100,
conv net parameters:

first layer – 64 kernels, 3x3 kernel size, stride 1, padding 1 on each size, pooling 2x2, batch normalization, dropout 0.2.
second layer - 128 kernels, 3x3 kernel size, stride 1, padding 1 on each size, pooling 2x2, batch normalization, dropout 0.2.

Confusion matrix-

	airplane	automobile	bird	cat	deer	dog	frog	horse	ship	truck
airplane	819	12	31	25	22	5	9	13	34	30
automobile	15	832	7	9	5	6	12	4	20	90
bird	70	2	592	35	117	63	69	32	11	9
cat	21	7	40	528	88	189	78	32	8	9
deer	14	3	32	33	788	33	43	45	8	1
dog	15	3	34	122	59	687	29	46	1	4
frog	8	2	23	45	38	21	852	4	5	2
horse	8	0	24	23	56	50	8	822	5	4
ship	64	20	7	9	6	12	6	6	847	23
truck	27	53	5	21	10	8	4	11	21	840

ResNet:

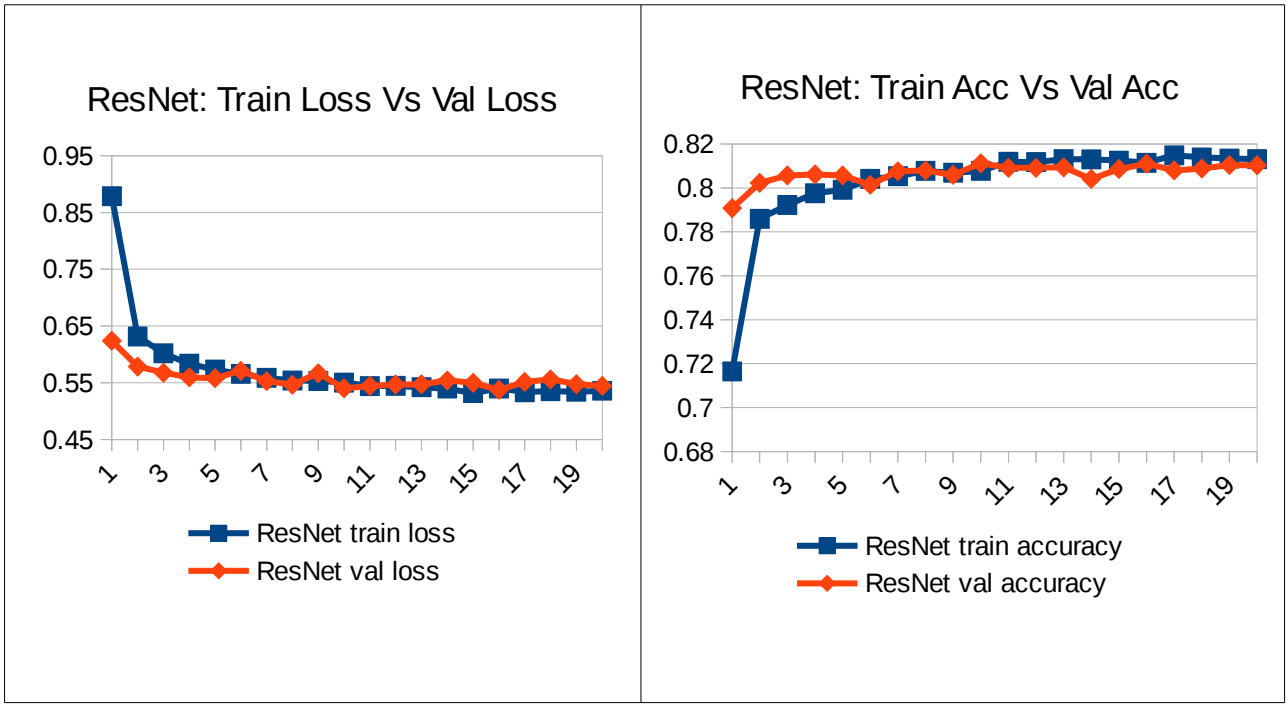

Table 2: ResNet train vs validation loss (on the left) and accuracy (on the right)

Loss – train: 0.535, validation: 0.544, test: 0.565
Accuracy – train: 81.5%, validation: 81.1%, test: 80.7%
Parameters –
Batch size: 64,
Learning rate: 0.001 with Adam optimizer

Confusion matrix-

	airplane	automobile	bird	cat	deer	dog	frog	horse	ship	truck
airplane	835	11	46	13	7	3	7	8	60	10
automobile	22	888	2	9	0	2	3	6	13	55
bird	34	2	795	51	49	21	27	11	6	4
cat	18	4	46	718	20	114	44	17	12	7
deer	13	0	78	46	738	23	29	58	11	4
dog	3	2	38	141	23	741	19	30	2	1
frog	4	5	58	47	29	17	828	6	5	1
horse	18	5	33	33	45	36	8	812	6	4
ship	68	20	12	5	3	3	2	4	872	11
truck	27	72	2	10	1	5	2	5	26	850