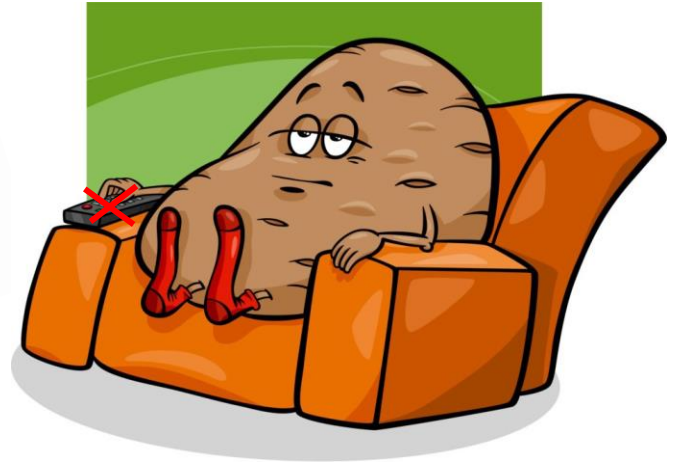


Gesture Control for Television

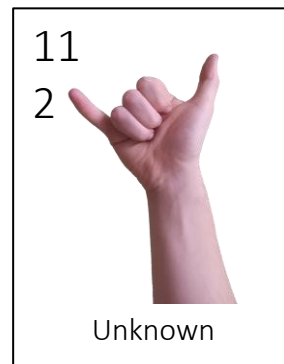
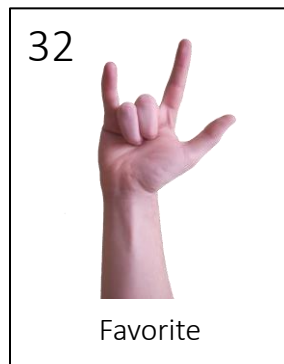
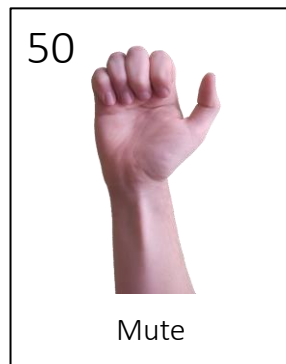
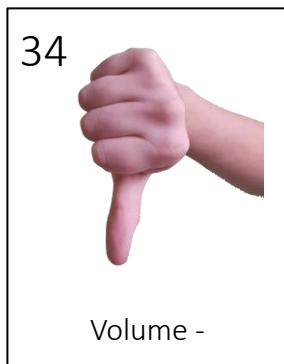
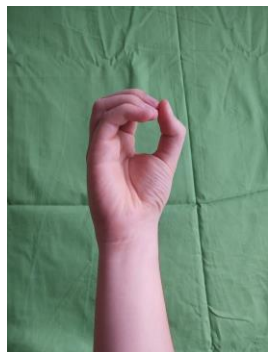
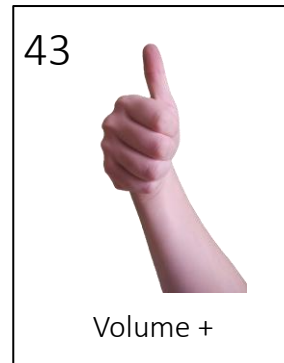
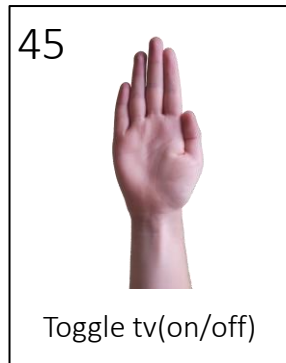
Christian Nestroy, Daniel Søholm, Torkil
Kristiansen

Aim of the project

- Recognizing gestures from still images
- Making the gestures linked to a television action

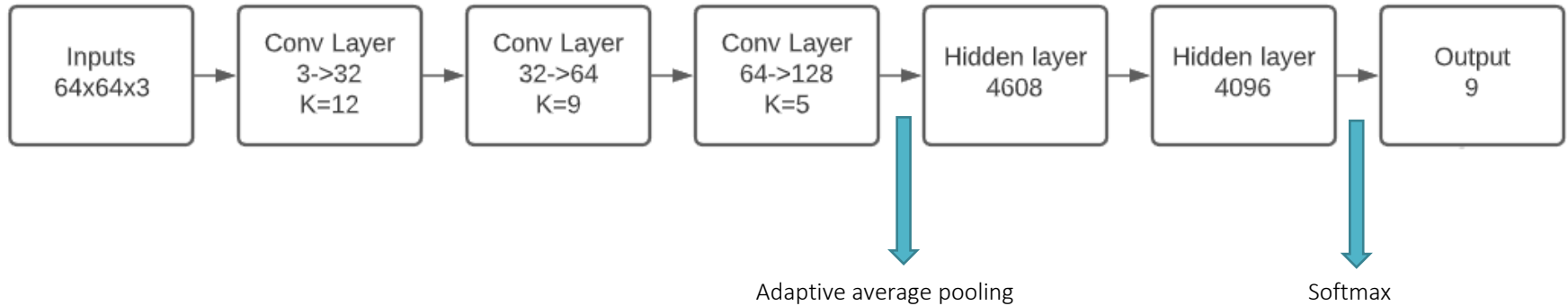


Supported gestures



Total number
of images
made: 448

Net topology

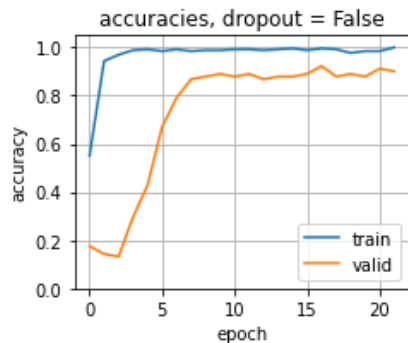
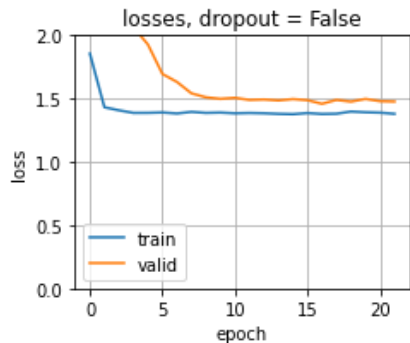
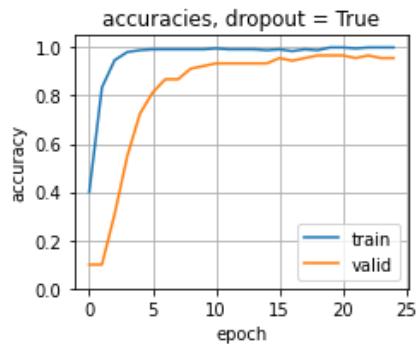
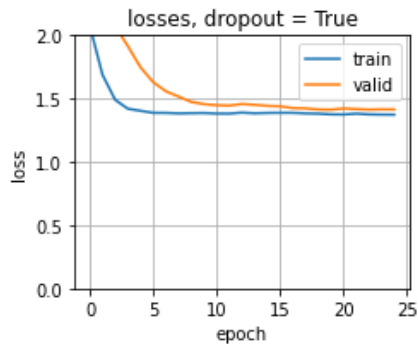


Tuning the net

- Data augmentation by rotation
- Data normalization
- Dropout of fully connected hidden units
- Batch normalization in each hidden layer
- Learning rate for Adam smaller than default
- Smaller minibatch size has regularizing effect

lr	dropout	minibatch size	best val acc	epoch best val acc
0.001	yes	128	0.90	47
0.001	yes	64	0.96	21
0.0001	yes	64	0.93	11
0.0001	no	64	0.91	25

Results without data augmentation



ground truth	0	9.89%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	1	0.00%	9.89%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	2	0.00%	0.00%	6.59%	0.00%	1.10%	0.00%	0.00%	0.00%	
	3	0.00%	0.00%	0.00%	10.99%	0.00%	0.00%	0.00%	0.00%	
	4	0.00%	0.00%	0.00%	0.00%	7.69%	0.00%	0.00%	1.10%	
	5	0.00%	0.00%	0.00%	0.00%	0.00%	9.89%	0.00%	0.00%	
	6	0.00%	1.10%	0.00%	0.00%	0.00%	0.00%	23.08%	0.00%	
	7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.69%	
	8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.10%	8.79%	
	0	1	2	3	4	5	6	7	8	
predicted										

ground truth	0	9.89%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	1	0.00%	9.89%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
	2	0.00%	0.00%	7.69%	0.00%	0.00%	0.00%	0.00%	0.00%	
	3	0.00%	0.00%	0.00%	10.99%	0.00%	0.00%	0.00%	0.00%	
	4	1.10%	0.00%	0.00%	0.00%	6.59%	0.00%	0.00%	1.10%	
	5	0.00%	0.00%	0.00%	0.00%	0.00%	9.89%	0.00%	0.00%	
	6	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.27%	0.00%	
	7	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.69%	0.00%	
	8	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.10%	8.79%	
		0	1	2	3	4	5	6	7	8
predicted										

0



1



2



3



4



5



6



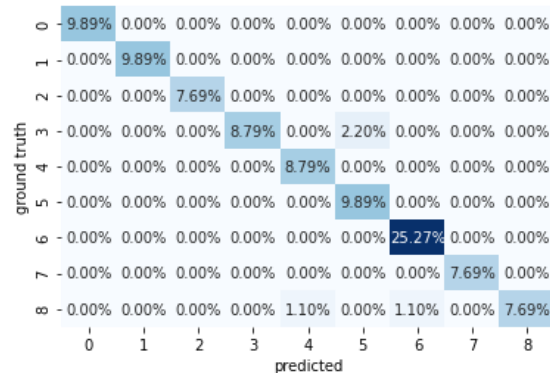
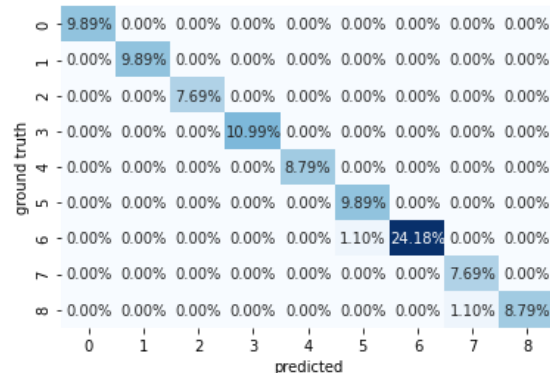
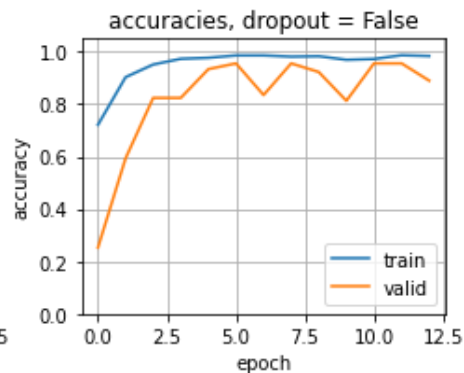
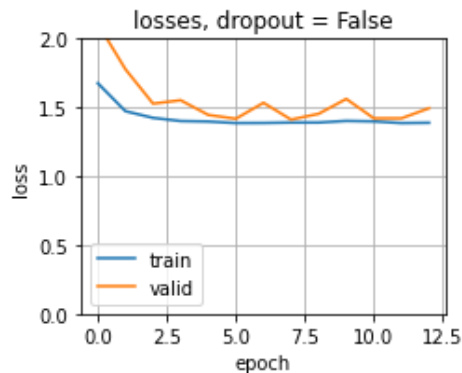
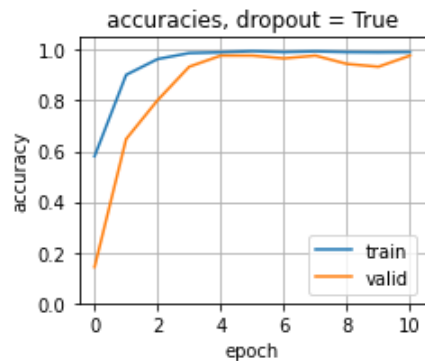
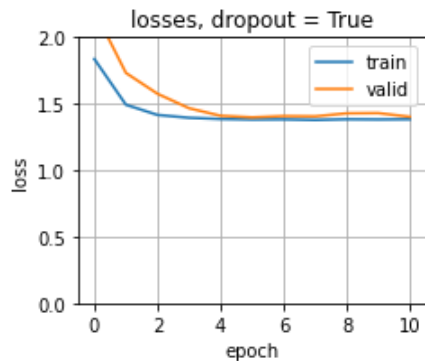
7



8



Results with data augmentation



0



1



2



3



4



5



6



7



8

