

Klasifikácia znakov americkej posunkovej reči

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Dataset

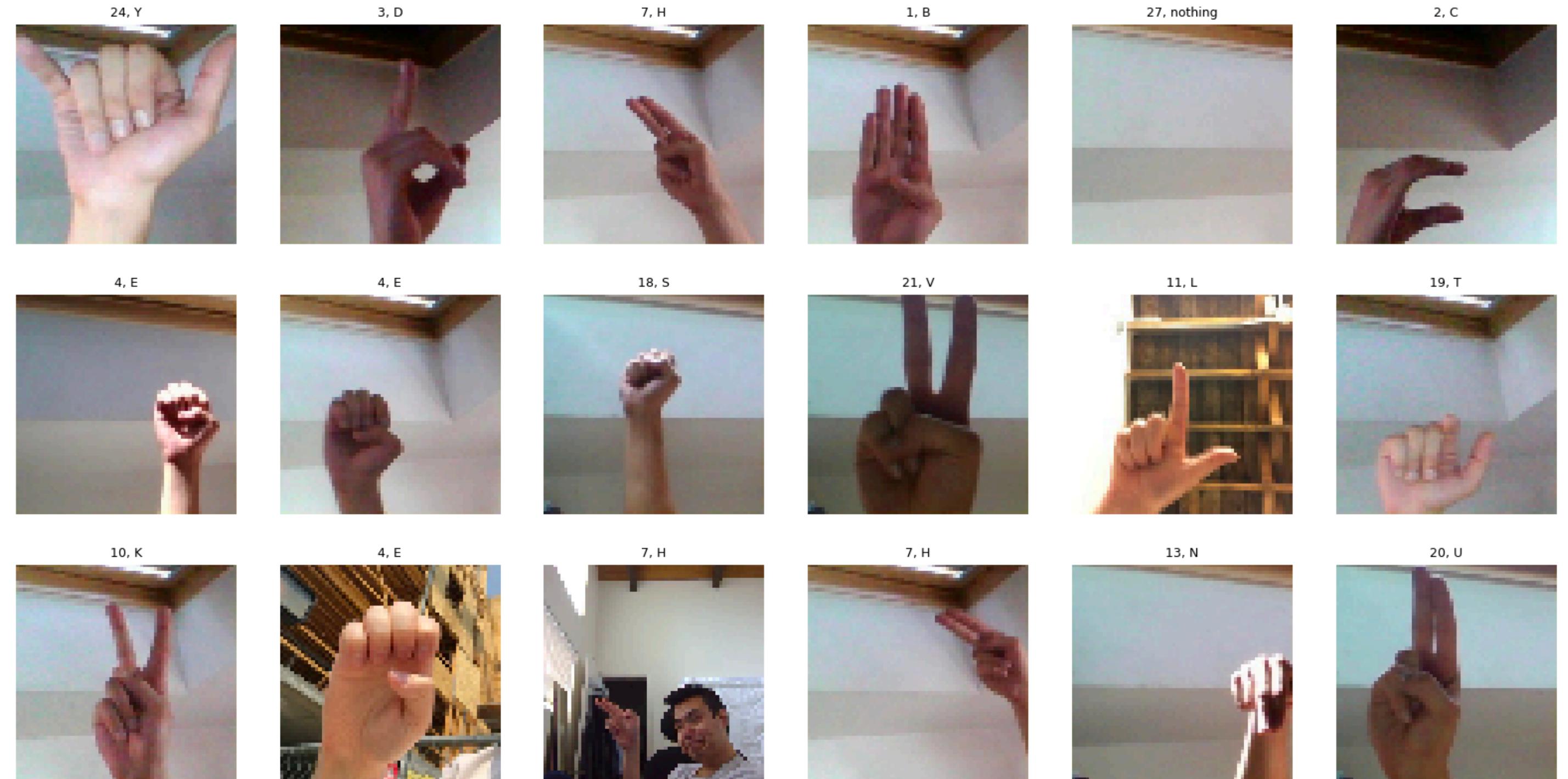
celkovo 90 162 obrázkov

- 72 129 (80%) na trénovanie
- 9 016 (10%) na validáciu
- 9 016 (10%) na testovanie

29 tried (písmená + špeciálne znaky)

predspracovanie:

- zmenšenie na 64x64 a orezanie
- zoškálovanie na hodnoty od 0 po 1



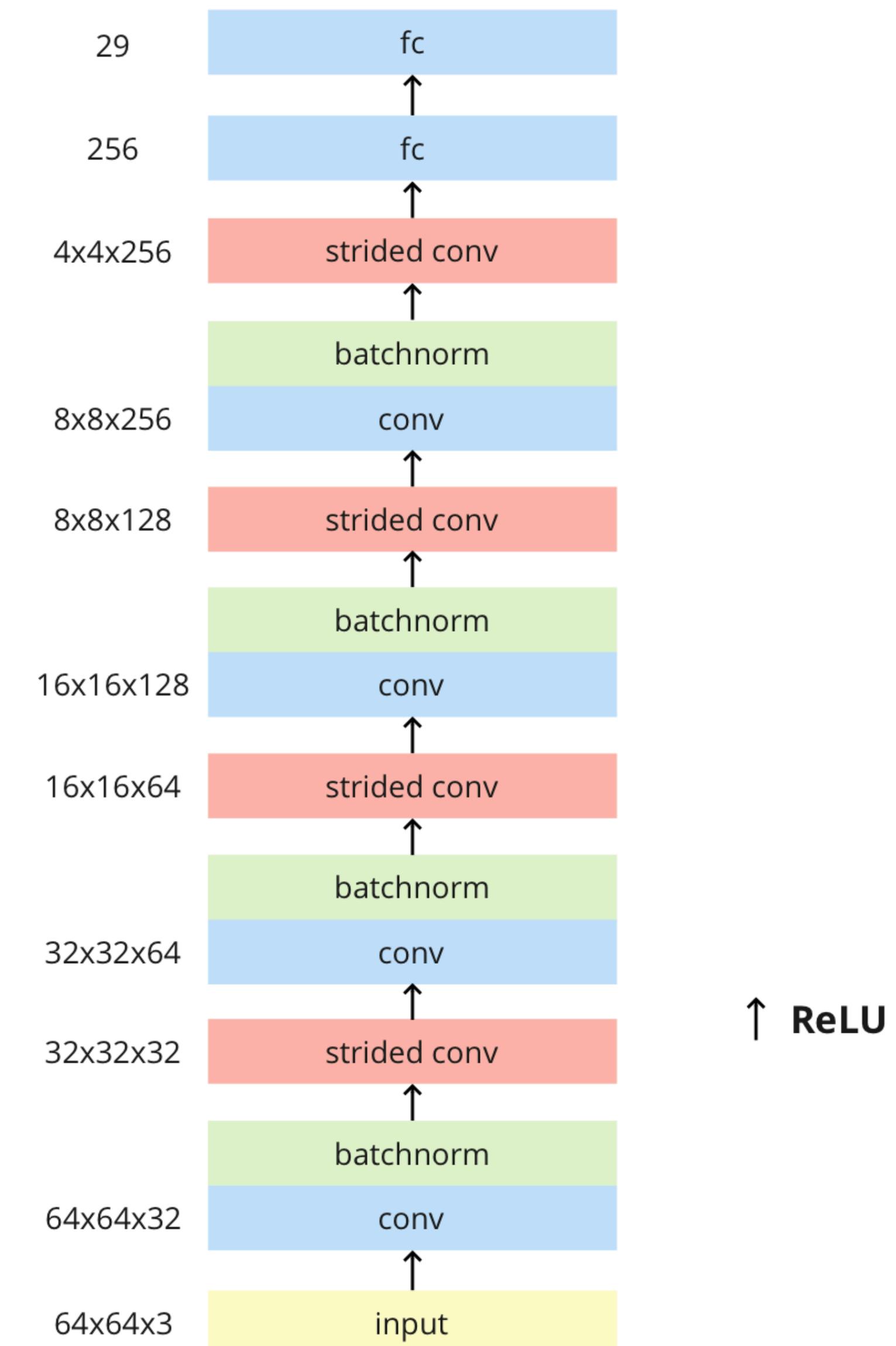
Architektúra

4 konvolučné bloky

- konvolúcia + batchnorm + konvolúcia so stride=2

2 plne prepojené vrstvy na klasifikáciu

ReLU ako aktivačná funkcia



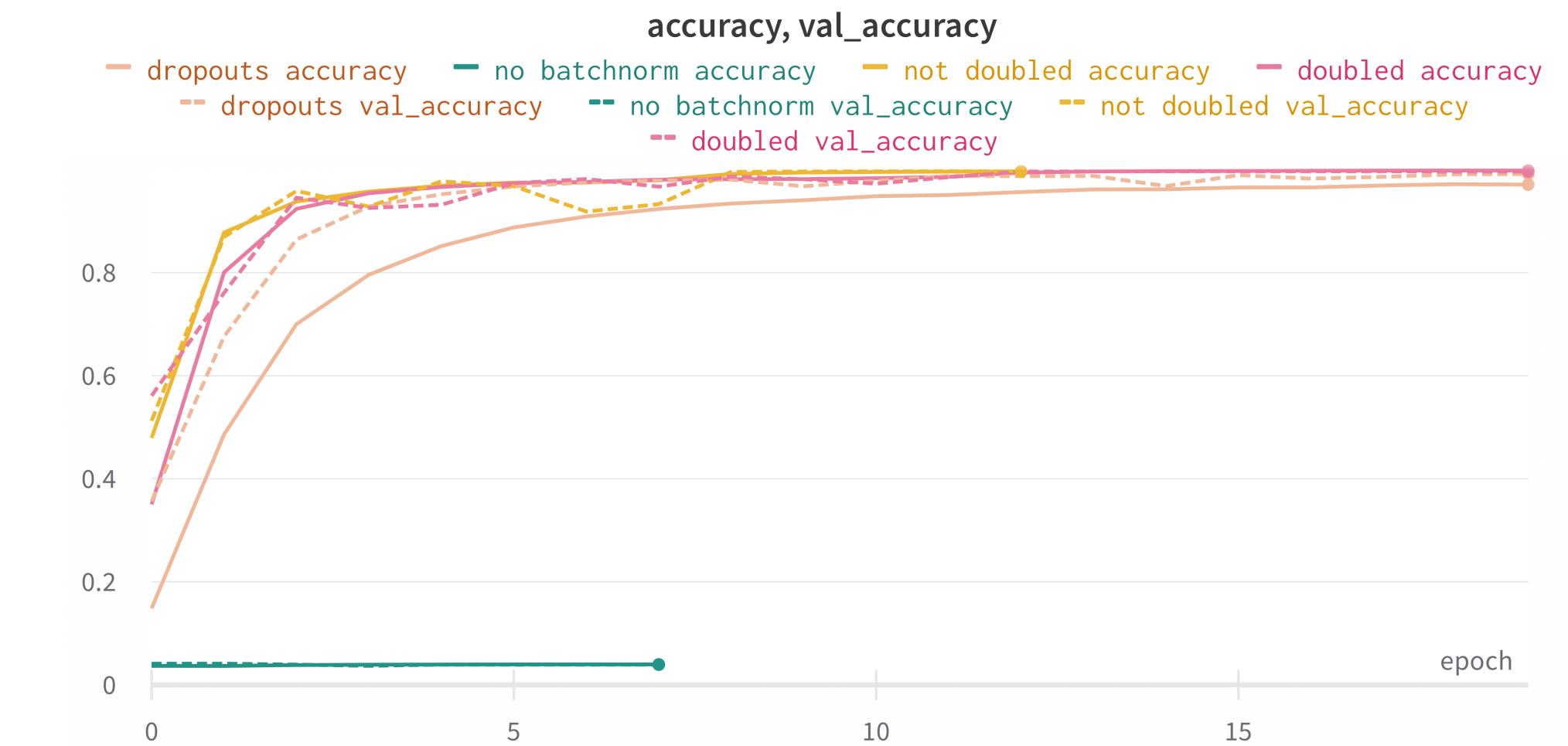
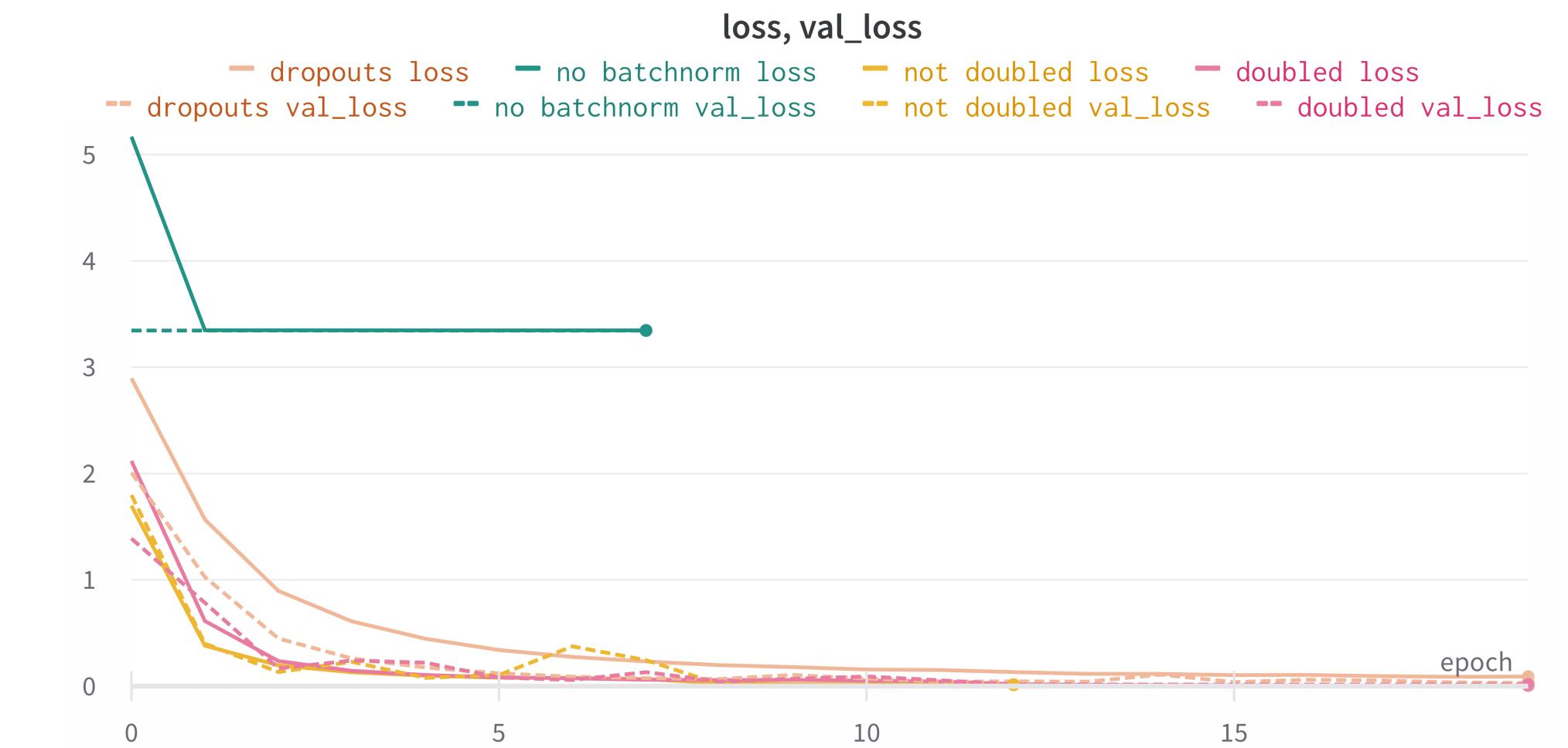
Tréning

parametre:

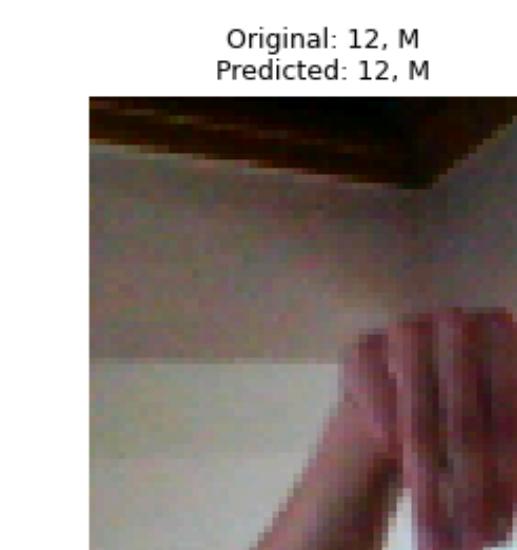
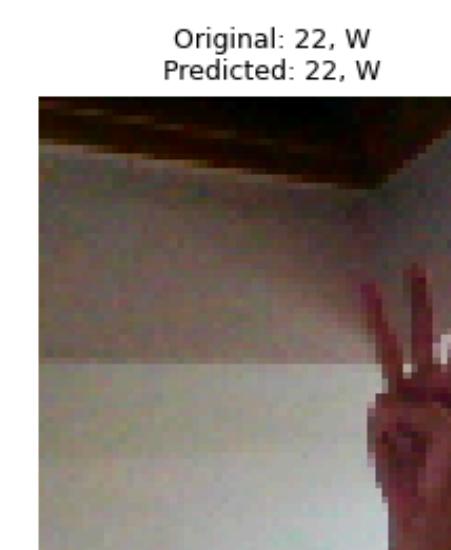
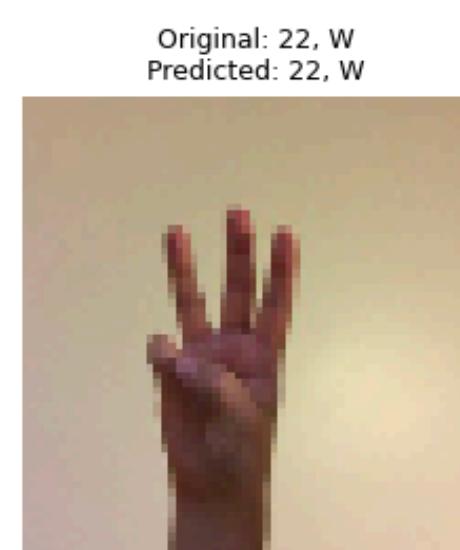
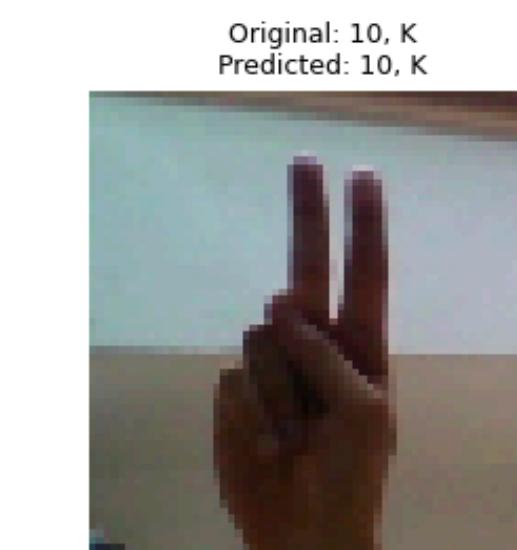
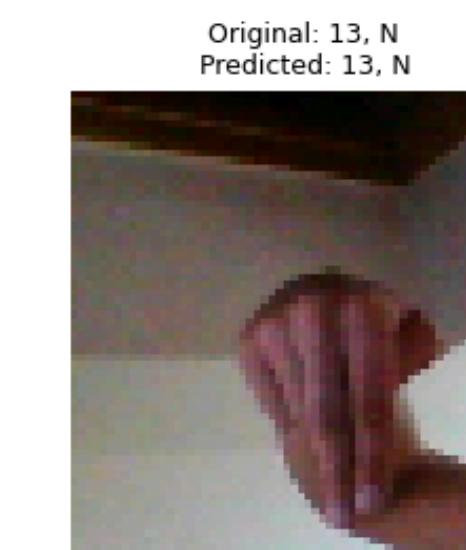
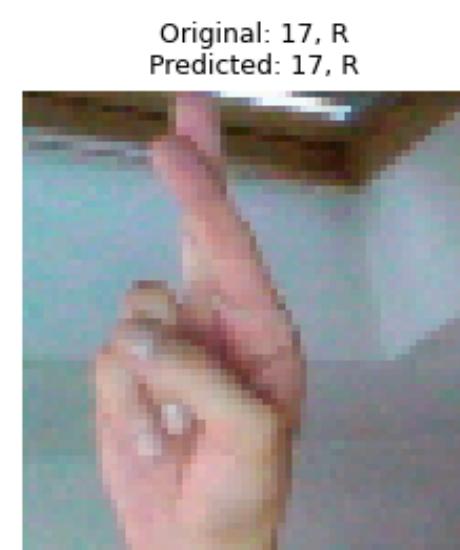
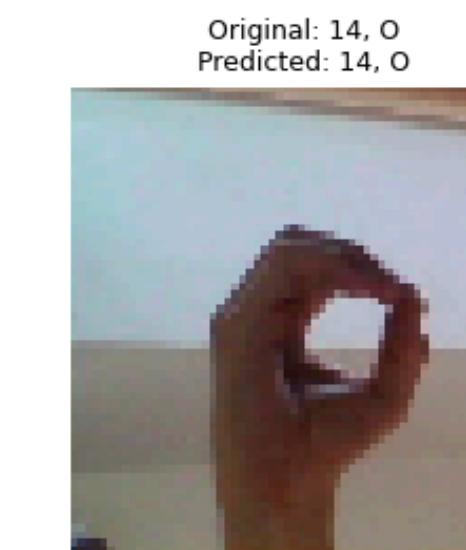
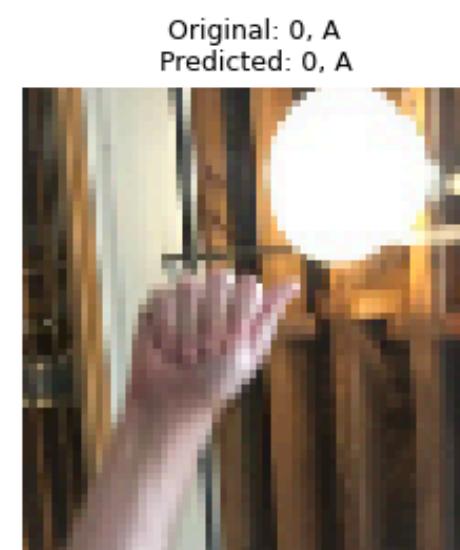
- batchsize 256
- max 20 epoch
- počiatočný learning rate 0.01

Adam ako optimizer

Cross entropy ako loss funkcia



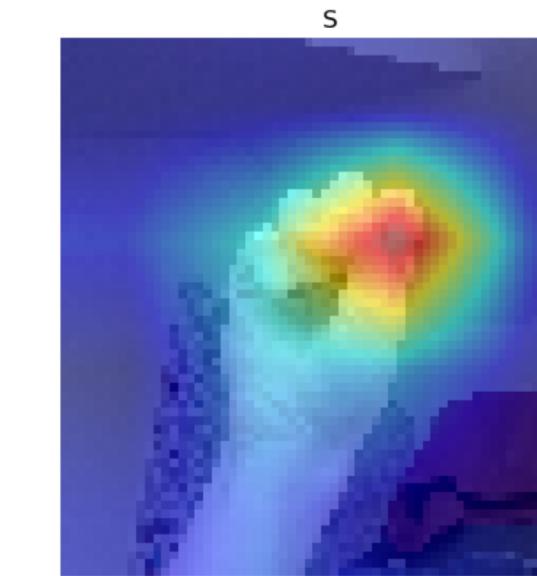
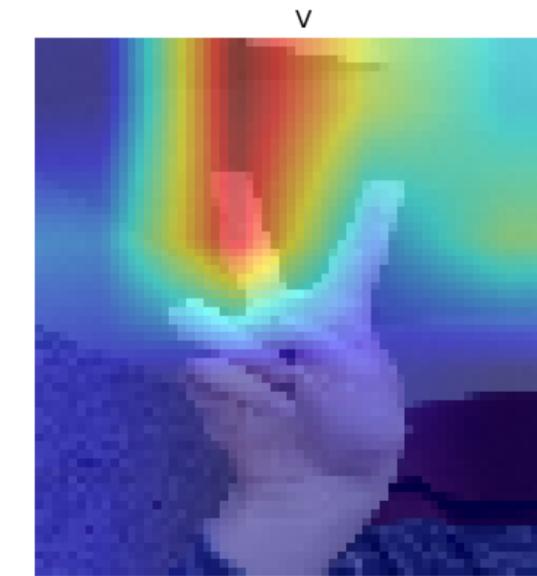
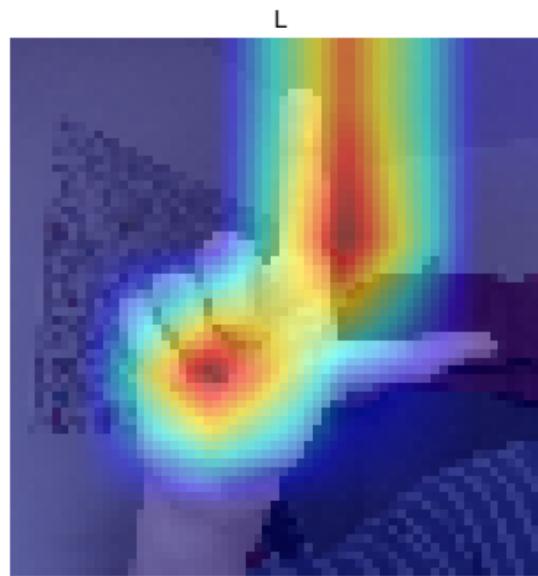
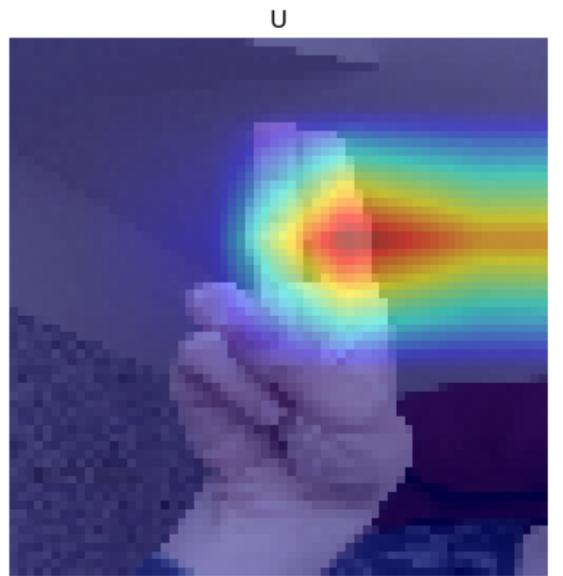
Evaluácia



Evaluácia

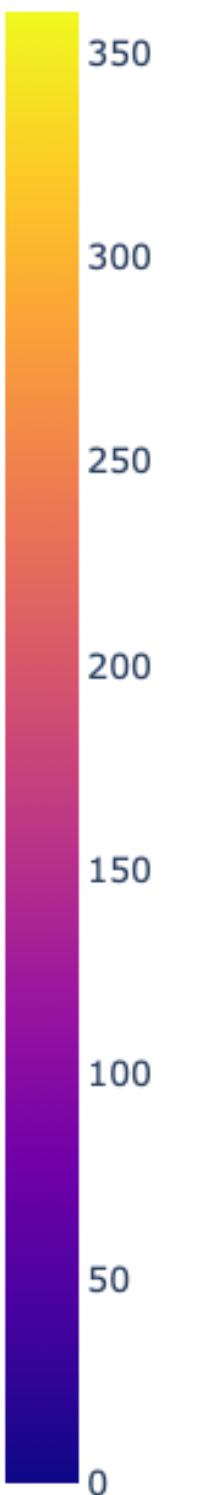
na testovacích dátach dosiahol náš najlepší model:

- priemerný loss 0.29164
- priemernú accuracy 0.94387



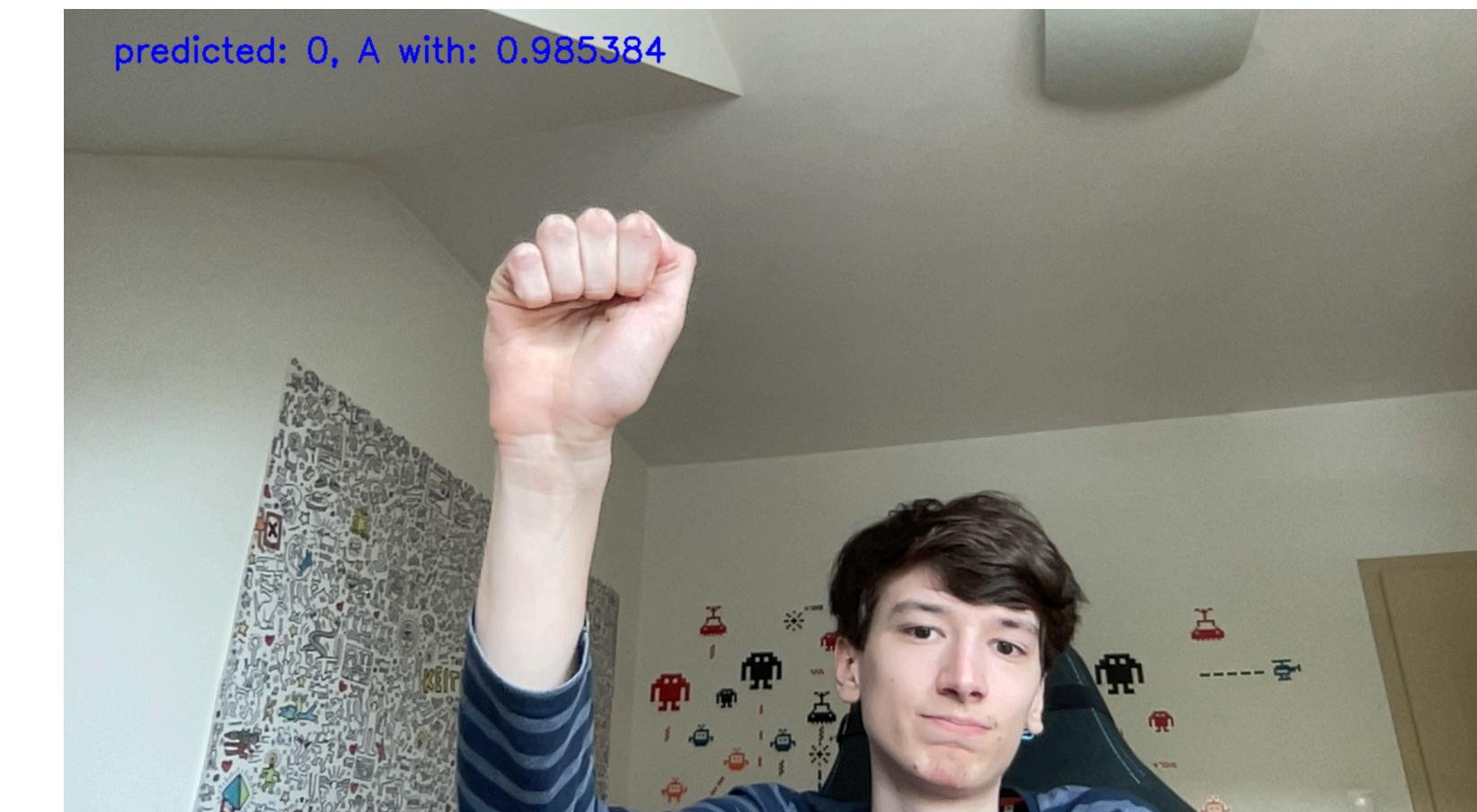
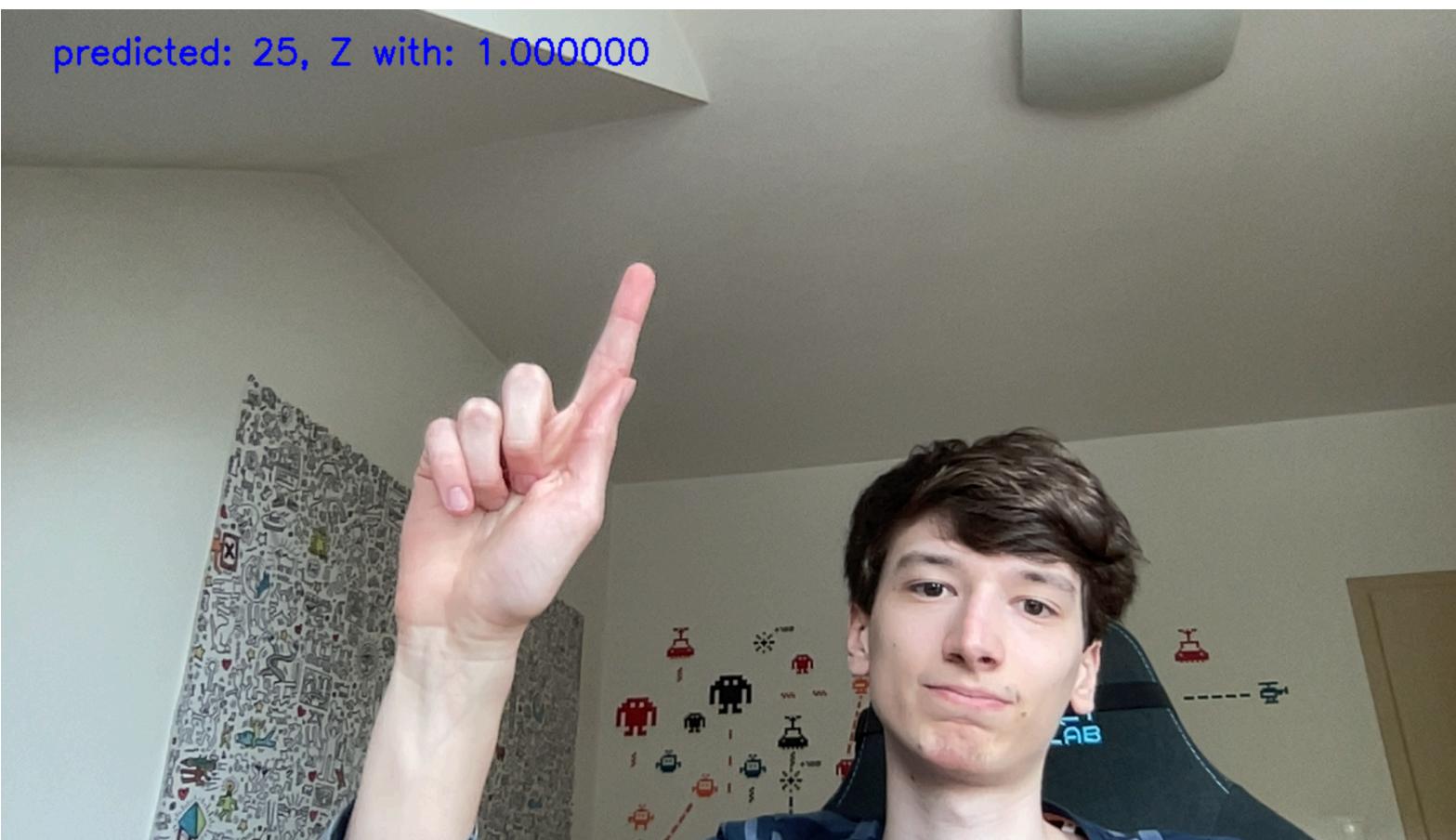
Confusion Matrix

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	X	Y	Z	del	space	nothing
A	331	0	3	1	2	0	1	3	0	0	0	1	2	2	0	0	1	2	0	0	2	0	2	7	0	1	0	
B	0	344	3	2	1	0	0	0	2	2	0	0	0	1	0	1	0	3	0	0	2	0	0	0	0	0	0	
C	0	0	349	1	0	2	0	1	0	0	0	0	0	1	3	3	0	0	0	0	0	0	0	0	0	0	1	
D	0	0	0	354	0	0	4	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	
E	0	3	4	0	339	0	5	0	1	0	0	0	0	3	1	2	0	0	1	0	0	0	0	0	0	2	0	
F	0	0	0	0	342	0	0	6	1	0	0	0	1	1	0	0	0	4	0	1	4	0	1	0	0	0		
G	0	0	0	0	0	330	19	0	0	0	0	0	0	0	3	0	3	0	0	4	0	0	0	0	2	0		
H	0	0	0	0	0	1	360	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
I	0	0	0	1	1	0	0	0	346	2	0	0	0	0	1	2	0	0	0	2	0	0	1	2	0	0		
J	0	0	0	0	4	2	8	1	343	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0		
K	0	1	0	0	0	0	0	0	0	331	0	0	0	0	1	0	3	0	0	0	21	1	0	0	3	0		
L	0	0	1	2	0	0	0	0	0	0	352	0	0	0	0	0	2	0	0	3	0	0	0	0	1	0		
M	0	1	3	0	2	0	0	2	4	0	0	0	0	336	2	6	0	0	0	1	1	0	0	1	0	0		
N	2	0	2	0	2	0	0	0	0	3	0	0	11	326	6	2	0	0	3	0	0	0	2	0	0	2	0	
O	1	1	4	2	1	0	0	1	0	0	0	0	0	0	0	344	2	0	0	0	3	0	0	0	2	0	0	
P	0	0	0	0	0	0	2	7	0	0	0	0	0	0	0	1	344	4	0	0	0	0	0	0	0	2	1	
Q	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	1	2	346	0	1	0	0	0	0	5	3	
R	0	2	1	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	4	0	0	0	0	0	5	0		
S	12	0	1	0	14	0	0	0	1	0	0	0	2	3	2	0	0	0	320	0	0	0	0	3	0	0		
T	5	0	8	0	1	0	0	1	0	1	0	2	0	0	2	0	1	0	0	329	0	0	0	0	11	0		
U	0	7	0	1	0	0	0	0	1	0	0	0	0	0	0	0	15	0	0	332	0	0	0	5	0			
V	0	1	0	2	0	2	0	0	0	6	3	0	0	0	2	0	6	0	0	1	332	2	0	0	3	0		
W	0	0	2	1	0	1	0	1	0	0	3	0	0	0	1	0	0	0	0	18	332	0	1	0	0	1		
X	0	2	0	0	0	0	0	0	1	0	0	0	0	0	1	0	7	2	1	6	0	0	328	0	8	0		
Y	0	0	0	0	0	0	0	1	6	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	348	2		
Z	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	358	0		
del	0	0	3	0	0	0	0	1	2	0	0	0	0	0	0	0	3	0	0	1	0	0	0	0	1	0		
space	0	1	2	0	0	0	1	1	2	1	1	0	0	0	1	1	0	2	0	0	2	0	1	0	1	0		
nothing	0	0	1	0	1	0	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	355		



Evaluácia

Testovanie na vlastných dátach



Evaluácia

Demo