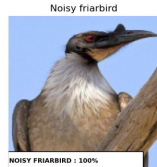
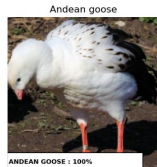
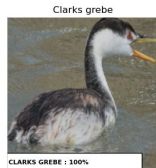
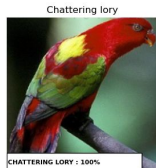
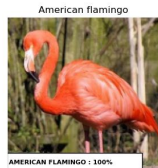
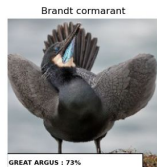
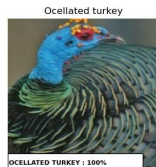
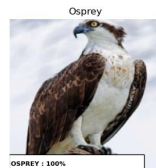


WHAT A BIRD BOT

BIRDS SPECIES IMAGE CLASSIFICATION

**by Anastasia Zolotar,
Anna Berdichevskia
Ann Balan**

DATASET WITH BIRDS IMAGES



DATASET WITH BIRDS IMAGES

Train Dataset	Validation Dataset	Test Dataset
84635	2625	2625

- ❖ contains 224x224x3 pictures in .jpeg format;
- ❖ validation and test with 5 images for each class
- ❖ almost balanced train dataset:



RUFOUS TREPE, 263 images



AMETHYST WOODSTAR, 130 images

IMAGE PREPROCESSING

for Train images

```
transforms.Resize(size=(232,232)),
transforms.CenterCrop(size=224),
transforms.RandomRotation(degrees=60),
transforms.RandomHorizontalFlip(),
transforms.RandomVerticalFlip(p=0.1),
transforms.RandomGrayscale(p=0.1),
transforms.ColorJitter(hue=.1, saturation=.1),
transforms.ToTensor(),
transforms.Normalize([0.485, 0.456, 0.406], [0.229, 0.224, 0.225])
```

for Validation and Test images

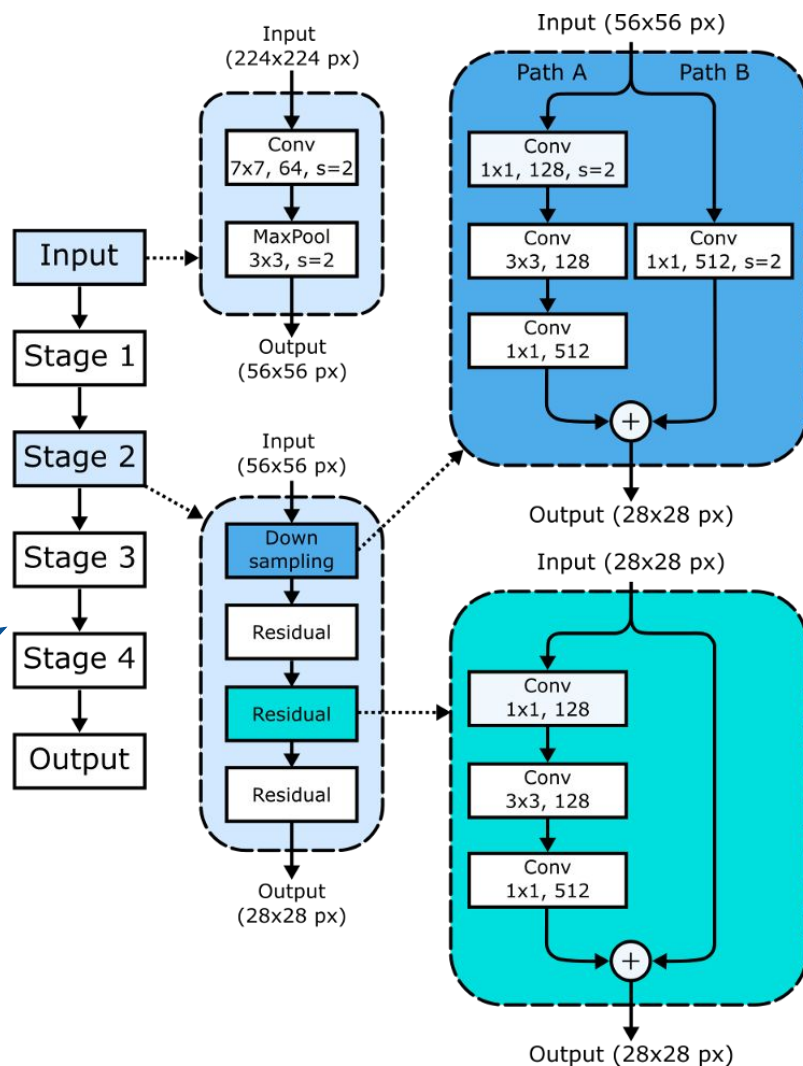
```
transforms.Resize(size=(232,232)),
transforms.CenterCrop(size=224),
transforms.ToTensor(),
transforms.Normalize([0.485, 0.456, 0.406], [0.229, 0.224, 0.225])
```


RESNET50

RESIDUAL NETWORK WITH 50 LAYERS

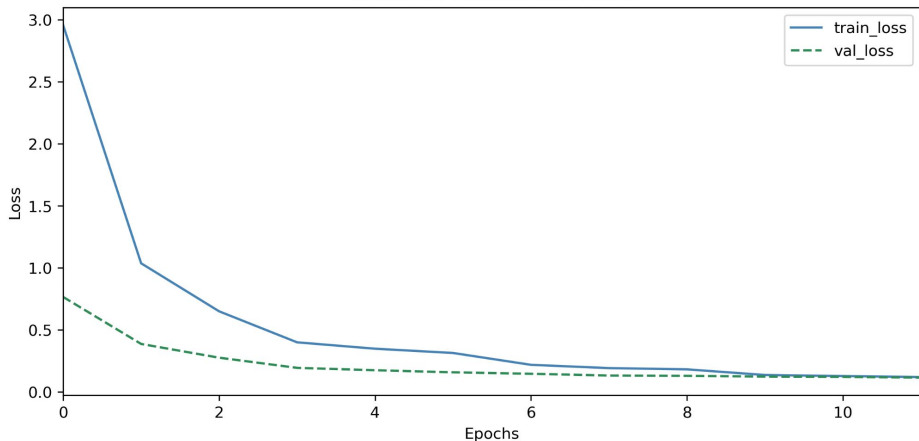
- ❖ epochs: 12
- ❖ batch size: 64
- ❖ weights: ResNet50_Weights.IMAGENET1K_V2
- ❖ initial lr: 1e-3
- ❖ optimizer: AdamW
- ❖ criterion: CrossEntropyLoss
- ❖ last activation: softmax

```
opt = torch.optim.AdamW([  
    {'params': model.layer4.parameters(), 'lr': lr/3},  
    # {'params': model.layer3.parameters(), 'lr': lr/9},  
], lr=lr)
```

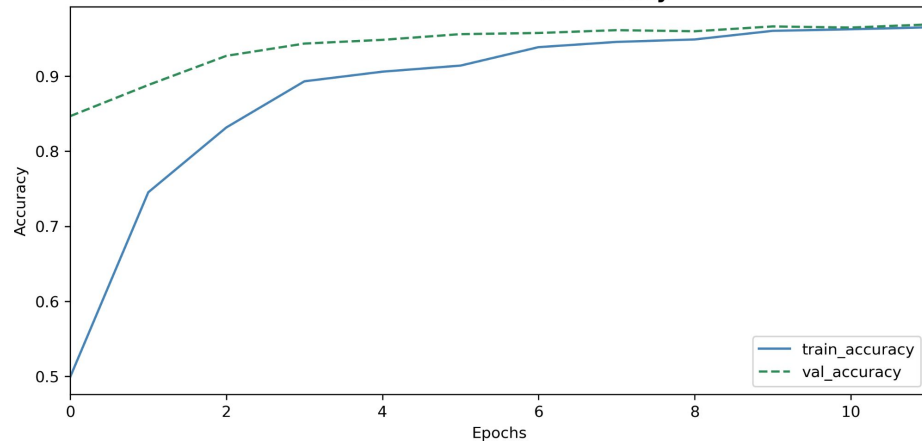


TRAINING AND VALIDATION PROCESS

Train vs Validation Loss



Train vs Validation Accuracy



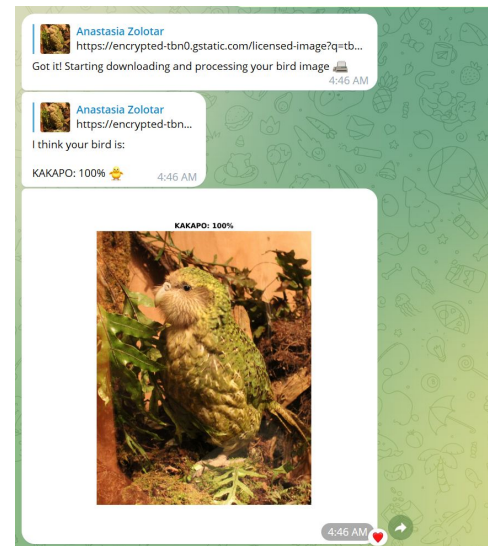
Dataset	precision	recall	f1 score	accuracy
Validation	0.974	0.97	0.969	0.97
Test	0.985	0.982	0.981	0.982

WHAT A BIRD BOT



- ❖ Telegram Bot created with `aiogram`
- ❖ receives both birds images and links
- ❖ sends 3 the most probable bird species in case of prediction accuracy < 60

Let's try to use it!



@WHATABIRD_BOT

