

INSTCOLORIZATION MODEL TRAINED ON COLORIZATION OF IMAGES WITH TASK TRANSFER ON CLASSIFICATION

Authors:

Cristian Vlad Pascu, Grigorie Ifrim, Stegarescu Ana-Maria

University of Bucharest, Faculty of Mathematics and Computer Science 2021

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INTRODUCTION

- InstColorization [1] is a model that uses 3 networks in order to colorize images. The first network colorizes the full image, the 2nd one uses detectron2 (by facebookresearch [2]) for object identification and colorizes with the help of said objects. The fusion network uses data from both the full image and the objects. All 3 networks can work as separate colorization models.
- We adapted the Siggraph network used in full and instance stages for classification, on a dataset of 10 fruits and vegetables. Siggraph is a network composed of 10 sequential models that serve as layers, most of them convolutional. Each model has a bout 2-3 convolutional layers with relu activation inbetween. The 3rd model sends information to the 8th model, so Siggraph works as a U-net [3].
- For the redefined classification model, we used the first 5 models, with 4 convolutional layers added plus a linear layer of output size 10. We used Cross Entropy as our loss function for classification. and ReLU as activation function inbetween layers.

PLOT

This are the results we got for 10 classes, where classes are in groups of color: 4 classes yellow, 3 - red, 3 - orange.

Figura 1 – Instance model on 100 epochs with lr=0.001

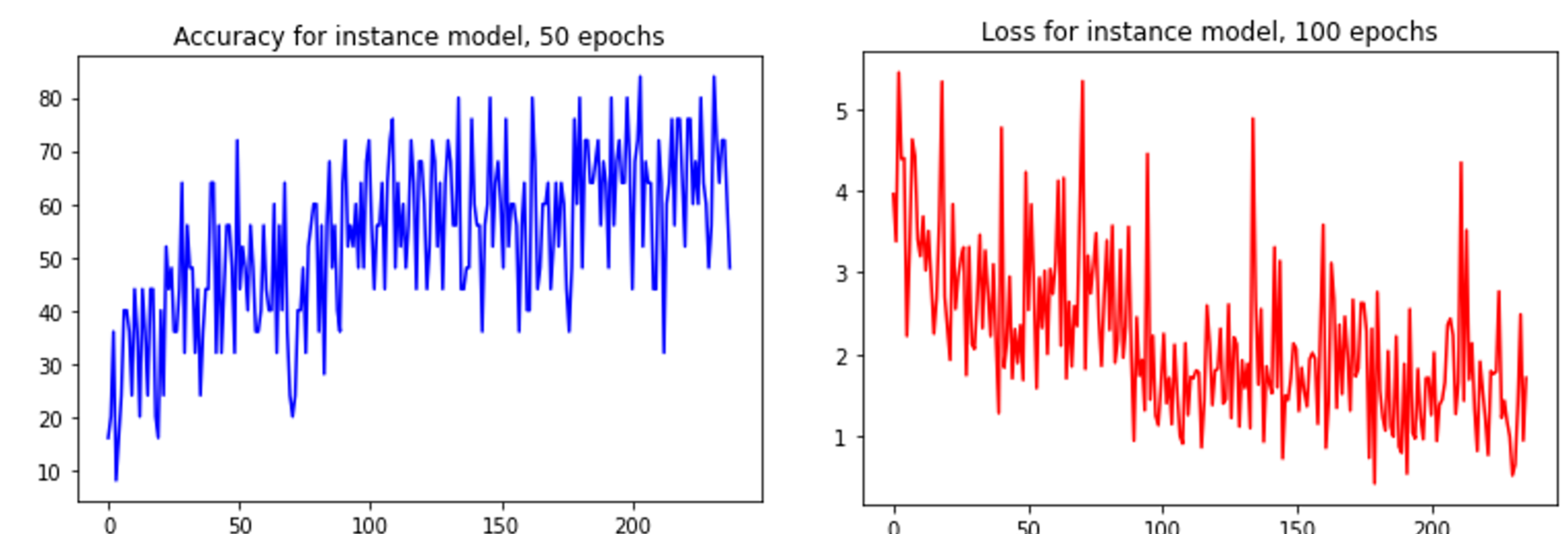
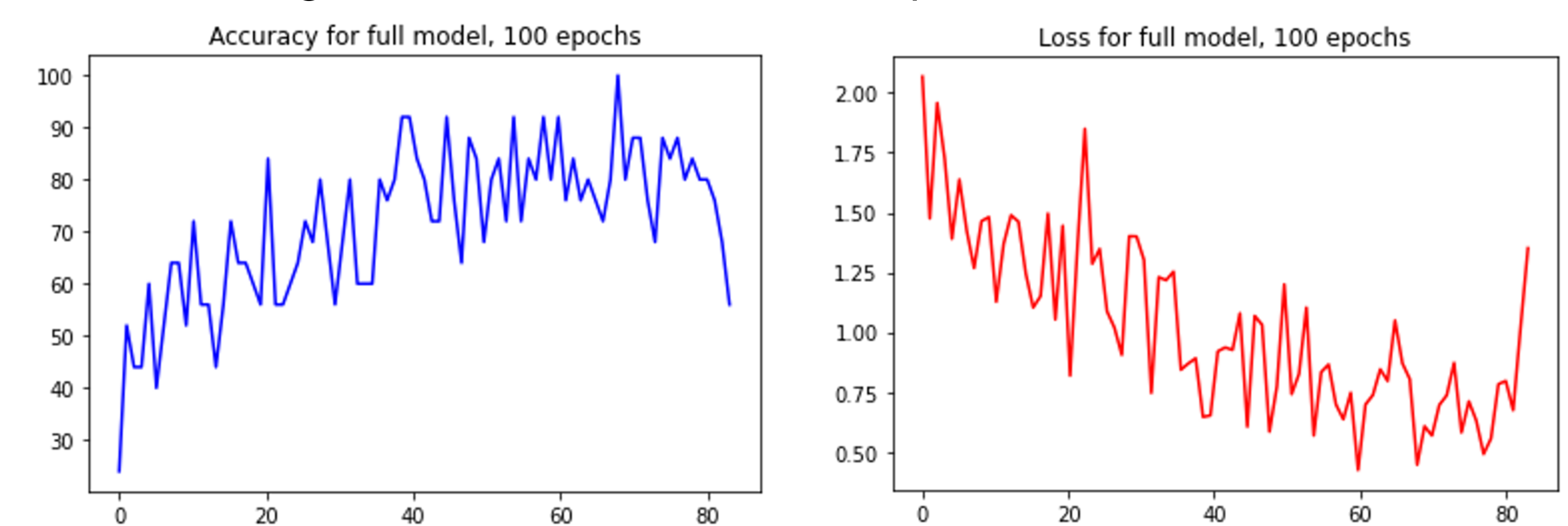


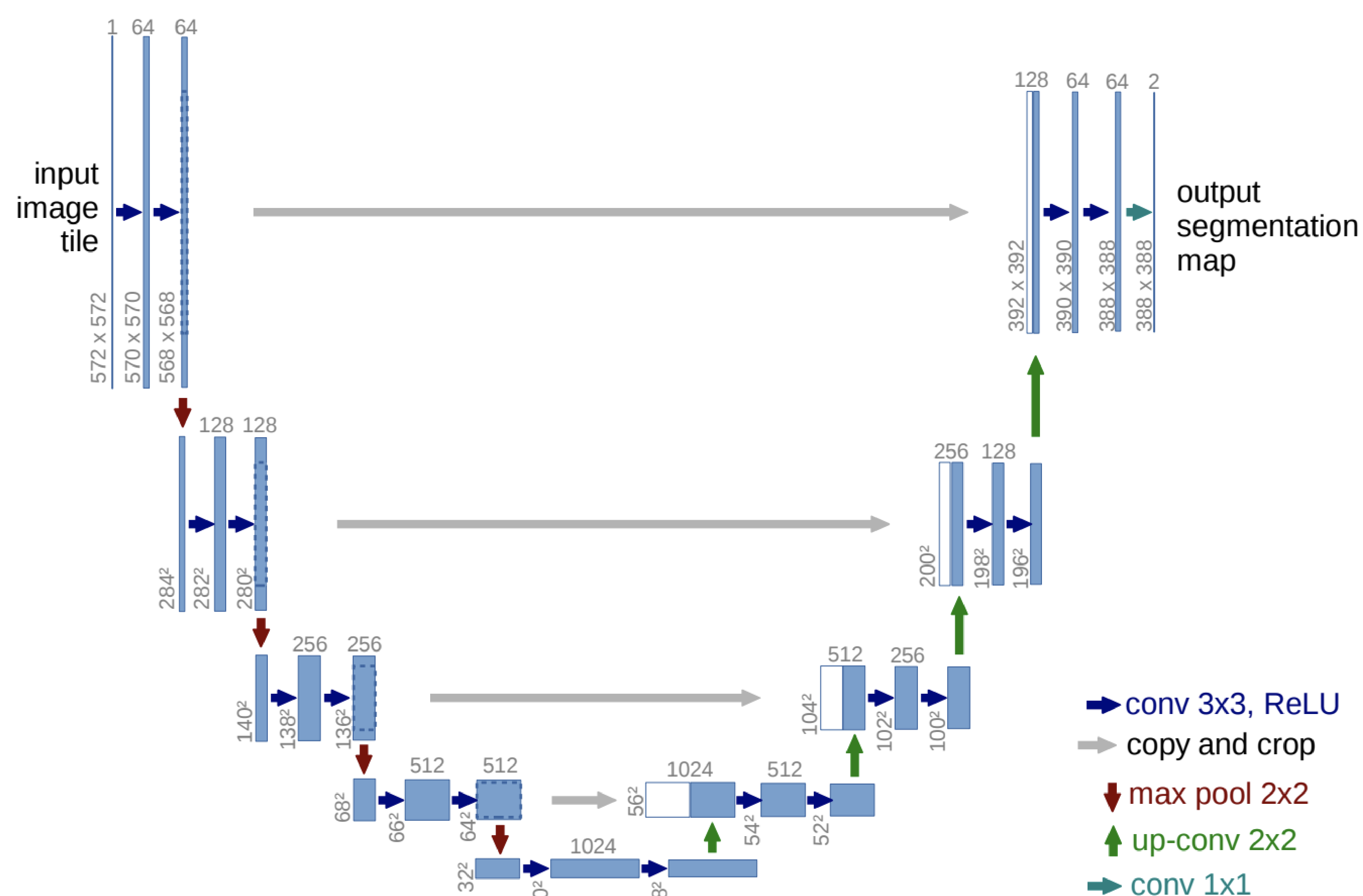
Figura 2 – Full model on 100 epochs with lr=0.001



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[3] About U-nets

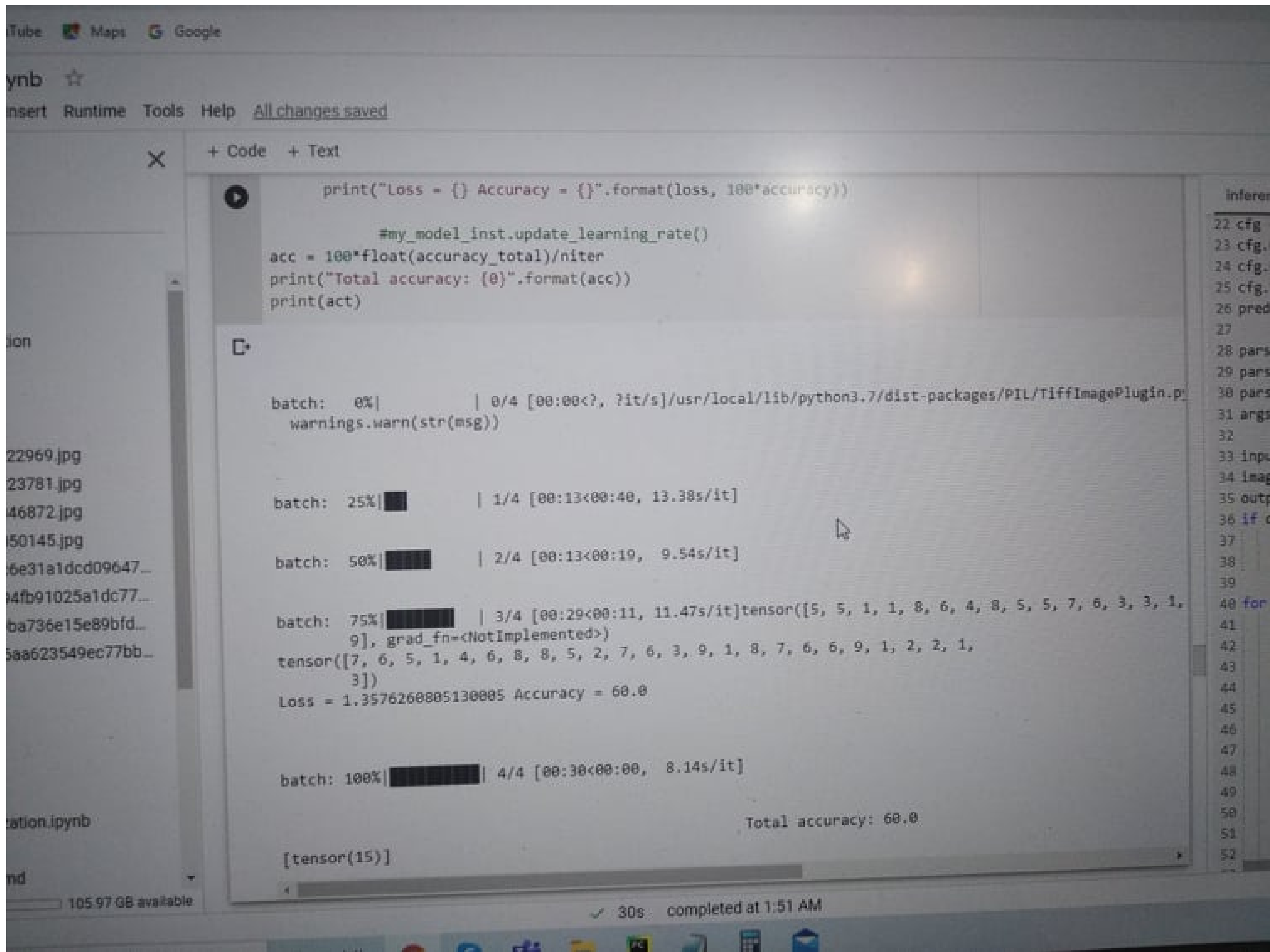
Figura 3 – U-NET



Test results

The pretrained model gives about 50-65% accuracy on the test dataset. We think that is because the dataset has classes with similar color.

Figura 4 – Result



COLORIZATION RESULTS

In the next figure the images are as follows: predicted color, grayscale, original.

Figura 5 – Full model on epoch 62 and Instance model on epoch 24 with lr=0.001



CONCLUSION

The plot accuracy and loss on both models are uneven and unpredictable (meaning they tend to grow or shrink in value with a high intensity in a short amount of iterations). We think that is because of the dataset: the model is using colors to guide it to the right class. There are too many classes with same color. The plot and accuracy depend solely on how many images of same color it will choose at random from the dataset for the current batch.

REFERENCES

- [1] InstColorization
- [2] Detectron2 by facebookresearch