UDACITY

PROJECT

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A part of the Robotics Software Engineer Program

PROJECT REVIEW

CODE REVIEW 1

NOTES

SHARE YOUR ACCOMPLISHMENT!

Requires Changes

2 SPECIFICATIONS REQUIRE CHANGES

Glad to receive your project, good job on the first submission.👍
But there are some missing points in your current report, keep on the good work!

Some extra links

- Larger kernel matters
  https://arxiv.org/abs/1703.02719
- There are many modern methods based on FCN rencently, have a quick review
  http://blog.qure.ai/notes/semantic-segmentation-deep-learning-review
  https://meetshah1995.github.io/semantic-segmentation/deep-learning/pytorch/visdom/2017/06/01/semantic-segmentation-over-the-years.html

Writeup

The write-up / README should include a statement and supporting figures / images that explain how each rubric item was addressed, and specifically where in the code each step was handled. The write-up should include a discussion of what worked, what didn't and how the project implementation could be improved going forward.

This report should be written with a technical emphasis (i.e. concrete, supporting information and no 'hand-waiving'). Specifications are met if a reader would be able to replicate what you have done based on what was submitted in the report. This means all network architecture should be explained, parameters should be explicitly stated with factual justifications, and plots / graphs are used where possible to further enhance understanding. A discussion on potential improvements to the project submission should also be included for future enhancements to the network / parameters that could be used to increase accuracy, efficiency, etc. It is not required to make such enhancements, but these enhancements should be explicitly stated in its own section titled "Future Enhancements".

Good job, but some points are missing in your report.

- Please add some figures about model architecture, training results, following results, etc, as shown in rubric.

Other comments:
You can also improve your report structure. For example,

- Introduction. The background, problem of CNN, benefits of FCN
- Model architecture. Encoder, 1x1 convolution, decoder, skip connection (their roles and structures)
- Results. Data preprocessing, hyperparameters, loss results
- Discussion/Further improvement.

The student clearly explains each layer of the network architecture and the role that it plays in the overall network. The student can demonstrate the benefits and/or drawbacks of different network architectures pertaining to this project and can justify the current network with factual data. Any choice of configurable parameters should also be explained in the network architecture.

The student shall also provide a graph, table, diagram, illustration or figure for the overall network to serve as a reference for the reviewer.

✅The model architecture is explained well.

- You can use `history = model.fit_generator()` to store training losses, use `history.history['loss']` and `history.history['val_loss']` to plot training results. https://keras.io/models/model/

The student explains their neural network parameters including the values selected and how these values were obtained (i.e. how was hyper tuning performed? Brute force, etc.) Hyper parameters include, but are not limited to:

- **Epoch**
- **Learning Rate**
- **Batch Size**
- **Etc.**

All configurable parameters should be explicitly stated and justified.

This part meets rubric.
And

- `steps_per_epoch` is commonly defined as `len(traning_data)/batch_size`
- You can also tune kernel size, filters , layers, etc.

Moreover, we should improve model performance as possible (the initial criterion is 45%). We can learn more from these explorations, have a better performance for exhibiting, improve problem solving ability...

The student demonstrates a clear understanding of 1 by 1 convolutions and where/when/how it should be used.

The student demonstrates a clear understanding of a fully connected layer and where/when/how it should be used.

Good job explaining the difference between 1x1 convolutions and fully connected layer.

Further reading for 1x1 convolutions
http://iamaaditya.github.io/2016/03/one-by-one-convolution/

The student is able to identify the use of various reasons for encoding / decoding images, when it should be used, why it is useful, and any problems that may arise.

This part is preferred to be elaborated more.

- What information is reserved and what is lose?
- What is the purpose of skip connections?

The student is able to clearly articulate whether this model and data would work well for following another object (dog, cat, car, etc.) instead of a human and if not, what changes would be required.

✅Yes, this model architecture can be used for following any objects, but this trained model is avaliable only for this human now, we have to re-train it with new dataset if we want to use it for other objects.

Model

The file is in the correct format (.h5) and runs without errors.

✅Good, the model runs without errors, the target is followed correctly all the time.

The neural network should obtain an accuracy greater than or equal to 40% (0.40) using the Intersection over Union (IoU) metric.

✅Model accuracy is greater than 40%.

- The model performs terrible on targets **is not visable** and **from far away**? It can be predicted that the final score can be improved further with more training samples about these two scenarios.

RESUBMIT

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1 CODE REVIEW COMMENTS ›

Learn the best practices for revising and resubmitting your project.

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Student FAQ