CENG 796 - Peer-review form

Reviewed project ID: Group 3

Reviewed project's title (title of the paper): One-step Diffusion with Distribution Matching Distillation

Reviewer name(s): Mustafa Utku Aydoğdu - Yiğit Ekin

Instructions:

- Answer = *Yes*, *No* or *Partial*.
- You may expand sections as necessary.
- For most questions, you do not need to add comments, unless the instructions tell you otherwise.
- "Notebook" refers to "Jupyter Notebook" file that is expected to be named as main.ipynb

Question	**Answer**	**Comments**
Contains a jupyter notebook file	Yes	
Notebook is located at <project_root>/main.ipynb	Yes	
Notebook's first section contains paper information (paper title, paper authors, and project group members' name & contact information) Some good examples: see group03, group10, group11 (and a couple of other groups).	Yes	
Notebook contains a section for hyper-parameters of the model.	Yes	They set the hyperparameters as variables in a code block.
Notebook contains a section for training & saving the model.	Yes	The model save code is handled by "`CheckpointHandler`" `class implicitly, but we do not see any problem in this.`
Notebook contains a section (or a few sections) for loading a pre-trained model & computing qualitative samples/outputs.	Partial	Although the logic for loading the model is given, the checkpoints are from a toy dataset given in the notebook.
Notebook contains reproduced plots and/or tables, as declared.	Yes	As quantitative metric, they set a goal of reaching 2.66 FID score, Notebook does not contain this replication, but instead contains FID score with toy dataset.
Notebook contains pre-computed outputs.	Yes	

Data is included and/or a proper download script is provided.	Yes	
Notebook contains a section describing the difficulties encountered.	Yes	Mentioned in the Challanges & Assumptions section.
The paper has achieved its goals and/or explained what is missing.	Partial	We examined the neptune.ai training logs. In terms of FID, they reach a score of 5.32, whereas goal is 2.66. However, they mentioned that they may not reach the 2.66 FID in their goals.txt as well. We also examined the test images, though the images look blurry and deviate from the ground truth, considering the training is done only for 10 hours, the results are satisfactory.
The notebook contains a section that reproduces the figure(s) and table(s) declared in the goals.	Partial	As quantitative metric, they set a goal of reaching 2.66 FID score, and they propose to replicate the Figure 12 in paper. Notebook does not contain these replications, but instead contains FID scores and visual results with toy dataset.
The notebook also reports the original values of the targeted quantitative results, for comparison.	No	In main.ipynb notebook, these original values of targeted quantitative results are not provided.
MIT License is included.	Yes	
As the reviewer(s), you have read the paper & understood it.	Yes	
Implementation of the model seems correct.	YES	Based on the FID metric that constantly drops, and the visual outputs, we think that implementation is correctly done, only a longer training is needed. Also toy dataset results are satisfactory indicating there is not any huge problems with the implementation. Algorithm 2 matches the lines 11-38 in loss.py Denoising Loss in paper matches the lines 74-87 in loss.py In Algorithm 1, steps 9 to 13 correspond to the lines 41-71 in loss.py One thing we realized is that , In Equation 8 in paper for Distribution Matching Loss, the weighting factor formula is specified. The formula includes the sigma (standard deviation), however in the implementation they did not use this sigma factor. However in algorithm 2 description of the paper, they also suggest the weighting factor deviates from the equations in the implementation. So not a big problem is present.
Notebook looks professional (in terms of notation, readability, etc.)	Yes	The algorithm part can be better annotated, with this format reading is hard.

Source code looks professional (in terms of coding style, comments, etc.)	Yes	

Additional comments:
We observed that there are lots of wrapper classes, which can reduce the readability.

In the second stage results, you may consider adding target goals and actual results on the full dataset to the notebook.