CENG 796 - Peer-review form

Reviewed project ID: Group **6**

Reviewed project's title (title of the paper): Improved techniques for training score-based generative models
Reviewer name(s): Alpay Ozkan, Hidir Yesiltepe

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	
Notebook contains a section for training & saving the model.	yes	
Notebook contains a section (or a few sections) for loading a pre-trained model & computing qualitative samples/outputs.	yes	They have produced figure-25 of the paper containing grid of uncurated generated images as qualitative outputs.
Notebook contains reproduced plots and/or tables, as declared.	yes	There is FID vs iterations plot. In contrast to the paper, they have used 10k iterations and 10k samples for FID calculation whereas paper uses 5k iterations and 50k samples, due to computational limitations. It would be better to print the best_iteration variable in 16^{th} cell.

Notebook contains pre-computed outputs.	yes	There are generated images in main.ipynb
Data is included and/or a proper download script is provided.	Yes	download_data.sh and dataset.py are provided
Notebook contains a section describing the difficulties encountered.	yes	*There are challenges section in main.ipynb*
The paper has achieved its goals and/or explained what is missing.	yes	*They have achieved 15 FID score, but their target is 10.87, they will try different architectures to get closer to the target. However, their results are close quantitatively and qualitatively.*
The notebook contains a section that reproduces the figure(s) and table(s) declared in the goals.	yes	*In main.ipynb there is figure-25 of the implementation and also above that fid score is calculated as 15.83*
The notebook also reports the original values of the targeted quantitative results, for comparison.	yes	*They mentioned to reproduce 10.87 FID score, but they have reached 15 FID score on CIFAR-10 mainly due to architectural differences, their assumptions, and computational limitations.*
MIT License is included.	yes	*There is a license but it doesn't specify MIT.*
As the reviewer(s), you have read the paper & understood it.	yes	
Implementation of the model seems correct.	yes	*Architecture follows table-3 in the paper where several blocks and the overall network architecture is shown. Resblock, ResBlockDown, RefineBlock exactly match the classes in models.py* *The paper does not explicitly mention where to use (after which layer) instance normalization. They have applied after the first convolutional layer inside the resnet block of NCSNv2 module.* *Unconditional instance normalization is used in the implementation based on the table-1 of CIFAR-10 unconditional.* *x = x + step_size * model(x) / scale + math.sqrt(2 * step_size) * z corresponds to langevin equation under section 4*
Notebook looks professional (in terms of notation, readability, etc.)	partial	*Notebook is understandable and includes main sections. However, paper could have been analysed briefly. There is no paper summary.*
Source code looks professional (in terms of coding style, comments, etc.)	partial	*The implementation is understandable and clean. Does not include much unnecessary operations.* *Source code should contain further explanations and comments, it was a bit difficult to spot Langevin Dynamics on source code.*

Additional comments:

Paper explanation and more creative analysis would enrich this project. Implementation's structure is well designed. Code is readable and understandable, they almost have achieved their paper goals which we believe get even closer for version-2 submission. It would be better if they can elaborate more on the assumptions that they have made for the implementation in the notebook.