

## CENG 796 - Peer-review form

**Reviewed project ID:** Group 2

**Reviewed project's title (title of the paper):** PD-GAN: Probabilistic Diverse GAN for Image Inpainting

**Reviewer name(s):** Orhun Buğra Baran

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	
Notebook contains reproduced plots and/or tables, as declared.	Yes	
Notebook contains pre-computed outputs.	Yes	
Data is included and/or a	Yes	

proper download script is provided.		
Notebook contains a section describing the difficulties encountered.	Yes	
The paper has achieved its goals and/or explained what is missing.	Partial	They obtain significantly better FID scores than what is reported in the paper which may mean a mistake in either FID calculation or another design problem. This is especially the case because their results seem agnostic to Mask Ratio yet paper reports significant drop in FID when Mask Ratio is increased. However, the images they obtain look fine.
The notebook contains a section that reproduces the figure(s) and table(s) declared in the goals.	Yes	
The notebook also reports the original values of the targeted quantitative results, for comparison.	Yes	
MIT License is included.	Yes	
As the reviewer(s), you have read the paper & understood it.	Yes	
Implementation of the model seems correct.	Partial	<p>I am a bit confused in terms of feature matching loss and the discriminator itself. As far as I understood the paper uses a Vanilla Gan (but no information about the “Vanilla Gan”) with additional losses and in the end discriminator gives real/fake outputs. However, in the code discriminator outputs [batch_size, 2] vectors after a sigmoid layer. If they are using separate scores for real and fake usage of sigmoid may not be correct. However, there is no clear information about that in the paper.</p> <p>Another thing is feature matching loss (Comes from another paper: High-Resolution Image Synthesis and Semantic Manipulation with Conditional GANs<sup>[1]</sup>, eq 4) comes from only the final output of discriminator but in [1] it comes from many layers and their sum is taken.</p> <p>When calculating FID pretrained inception model expects input images to be in range [0,1], in general, but this may depend on which inception model they use. Therefore if they are unsure about that they may work with images that are not in desired range which may be the cause for confusing FID that they report (not so likely).</p> <p>During training</p> <pre>with torch.no_grad():     pred_fake = discriminator(out[i])     discriminator_loss =</pre>

		<p><code>calculate_feature_matching_loss(pred_real, pred_fake)</code></p> <p>I am not sure whether this piece works as intended. I would check whether feature matching loss gives gradients for generator. This may give None outputs but not sure. Since generator uses other additional loss terms if this piece has no contribution it is easy to overlook.</p> <p>One small thing is the generator gives unnormalized outputs but the raw images are normalized usage of tanh or sigmoid may help (if not already tried).</p>
Notebook looks professional (in terms of notation, readability, etc.)	Yes	
Source code looks professional (in terms of coding style, comments, etc.)	Yes	

**Additional comments:**

*Please write any suggestions that can content-wise and/or aesthetically improve the notebook or the source code.*

*You may also add your lengthy comments (eg. mathematical problems that you have found in the implementation) here, and, refer to this text in your comments above.*