CENG 796 - Peer-review form

Reviewed project ID: Group **7**

Reviewed project's title (title of the paper): HouseDiffusion: Vector Floorplan Generation via a Diffusion Model with Discrete and Continuous Denoising

Reviewer name(s): Furkan Genç, Barış Sarper Tezcan

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	The project contains a Jupyter Notebook file, the main interaction point. It's well-structured and easy to navigate.
Notebook is located at <project_root>/main.ipynb	Yes	The main notebook is correctly located at the project root, making it easily accessible. However, the project has two versions, stable and latest, which could confuse. Combining the project into a single, most up-to-date version would be beneficial.
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	The notebook begins with a clear introduction that includes all the necessary information about the paper and the project group members. This sets a clear context for the rest of the notebook.
Notebook contains a section for hyper-parameters of the model.	Yes	The notebook includes a section where the model's hyperparameters are clearly defined and explained. However, it would be helpful to include more details on how these hyperparameters were chosen and how they affect the model's performance.
Notebook contains a section for training & saving the model.	Yes	The notebook contains a comprehensive section for training the model. However, the training is currently done on a small portion of the data, which could limit the model's ability to generalize. Consider training the model on a more significant portion of the data.
Notebook contains a section (or a few sections) for loading a pre-trained model & computing qualitative samples/outputs.	Yes	The notebook includes sections for loading a pre-trained model and generating samples. However, the FID score and qualitative results indicate that the model's performance could be improved. Consider tuning the model or adjusting the training process to improve these results.

Notebook contains reproduced plots and/or tables, as declared.	Yes	The notebook contains reproduced plots and tables as declared. However, the qualitative results are unsatisfactory due to sub-optimal training, indicating a need for further model tuning and optimization.
Notebook contains pre-computed outputs.	Yes	Outputs are included, demonstrating the model's performance. However, the FID score and qualitative results indicate that the model's performance could be improved.
Data is included and/or a proper download script is provided.	Yes	Data preprocessing and loading are well-documented. However, the preprocessing step is time-consuming and could benefit from further optimization. Additionally, the project currently uses a small portion of the dataset for training, which could limit the model's ability to generalize.
Notebook contains a section describing the difficulties encountered.	Yes	The notebook includes a detailed section describing the difficulties encountered during the project. This admirable transparency provides valuable insights into the project's challenges.
The paper has achieved its goals and/or explained what is missing.	Yes	The project's goals are clearly stated, and the team has made progress towards achieving them. However, the team has identified areas for improvement and plans to replace the entire codebase with their implementations.
The notebook contains a section that reproduces the figure(s) and table(s) declared in the goals.	Yes	The notebook includes sections that reproduce the figures and tables declared in the goals. However, the qualitative results are unsatisfactory due to sub-optimal training, indicating a need for further model tuning and optimization.
The notebook also reports the original values of the targeted quantitative results, for comparison.	Yes	The notebook reports the original values of the targeted quantitative results for comparison. However, the current FID score is significantly higher than the original value, indicating a need for improvement.
MIT License is included.	Yes	The project correctly includes the MIT license, ensuring open and permissible code use.
As the reviewer(s), you have read the paper & understood it.	Yes	The paper is well-understood, and the project is well-executed.
Implementation of the model seems correct.	Yes	The model is implemented correctly, with careful attention to detail. However, the team encountered a *TypeError* due to a missing argument in the *create_model_and_diffusion* function call. This issue needs to be resolved to prevent errors during model creation.
Notebook looks professional (in terms of notation, readability, etc.)	Yes	The notebook is professional in terms of organization, readability, and presentation. However, two versions of the project could potentially confuse. Consolidating the project into a single, most up-to-date version could enhance its professionalism.
Source code looks professional (in terms of coding style, comments, etc.)	Yes	The source code is well-structured and includes helpful comments. However, the team encountered many problems during the development of the models, particularly with dimensionalities. These issues must be addressed to ensure the correct implementation of the models.

Additional comments:

It's crucial to highlight at the outset that the code for this project was already published more than a year ago on the provided GitHub repository [1]. This is significant because the course project requirement specifies that a paper without a code implementation should have been selected. Therefore, the fact that an implementation already exists could impact the originality and novelty of the project. This is an important issue that needs to be addressed to align the project with the course requirements.

Regarding dataset preprocessing, the team had to convert the original dataset into a more manageable format (JSON files), which was time-consuming. They optimized this process, but it still represents a significant portion of the project's workflow. The team also preprocesses the data from scratch for each training run, which could be further optimized to improve efficiency. This process is detailed in a Medium article by F. Mostafavi [2], which comprehensively explains the conversion process.

References

[1] Aminshabani. (n.d.). GitHub - aminshabani/house_diffusion: The implementation of "HouseDiffusion: Vector Floorplan Generation via a Diffusion Model with Discrete and Continuous Denoising", https://arxiv.org/abs/2211.13287. GitHub. https://github.com/aminshabani/house_diffusion/tree/main

[2] Mostafavi, F. (2023, September 1). HouseDiffusion Reproduction (in detail) - Fatemeh Mostafavi - Medium. Medium. https://medium.com/@f.mostafavi95/housediffusion-reproduction-in-detail-bdfd92bf126