

Single-Image 3DGS Scene Reconstruction with Geometry-Aware Priors

Machine Visual Perception Course Project Report

November 19, 2025

Information

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Group Number: TEST

1 Chapter 1: Introduction and Motivation

1.1 Section 1.1: Introduction to the problem

[Provide a thorough introduction to the problem and why it is important. Briefly explain what general techniques there are and how your project fits.]

1.2 Section 1.2: Background and related work

[Include a few very relevant related works and how your work relates to those, expanding on the previous section. We do not expect you to cover all previous works.]

1.3 Section 1.3: Overview of the idea

[Provide an overview stating why the idea of the project makes sense and what the main motivation is.]

2 Chapter 2: Method

2.1 Section 2.1: Baseline algorithm

[Explain the baseline architecture you used to build your algorithm on. You may reproduce figures from the original papers.]

2.2 Section 2.2: Algorithm improvements

[Explain what you implemented to improve over the baseline. You may include figures to explain the idea and logic. Focus on the ideas and not the implementation.]

2.3 Section 2.3: Implementation details

[Explain how you implemented the improvements. You may include code snippets with the corresponding explanations.]

2.4 Section 2.3: Data pipelines

[Explain your data format, how you consume the data in your algorithms, and data augmentation.]

2.5 Section 2.4: Training procedures

[Explain which framework and optimizers you use, how you implemented the training logic.]

2.6 Section 2.5: Testing and validation procedures

[Explain which framework you use, how you implemented the testing/ validation logic.]

3 Chapter 3: Experiments and Evaluation

3.1 Section 3.1: Datasets

[Explain the datasets utilized: what they contain, why they are utilized, assumptions, limitations, possible extensions.]

3.2 Section 3.2: Training and testing results

[Explain the training and testing results with graphs and elaborating on why they make sense, what could be improved.]

3.3 Section 3.3: Qualitative results

[Show in figures and explain visual results. Include different interesting cases covering different aspects/ limitations/ dataset diversity. If not converged, explain what we can expect once converged. Include any other didactic examples here.]

3.4 [Optional] Section 3.4: Quantitative results

[A table and associated explanations for quantitative results.]

3.5 [Optional] Section 3.5: Comparison to state-of-the-art

[Qualitative and/ or quantitative comparisons to one or more recent works, especially the baseline work.]

4 Chapter 4: Conclusions and Future Directions

4.1 Section 4.1: Conclusions

[Summarize what the project was about and the main conclusions.]

4.2 Section 4.2: Discussion of limitations

[Explain the limitations of your technique. You may want to refer to previous sections or show figures on the limitations.]

4.3 Section 4.3: Future directions

[State a few future directions for research and development. These typically follow from the discussion on limitations.]