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Single View to Stereo Image Synthesis

Progress Report 3

December 14, 2025,

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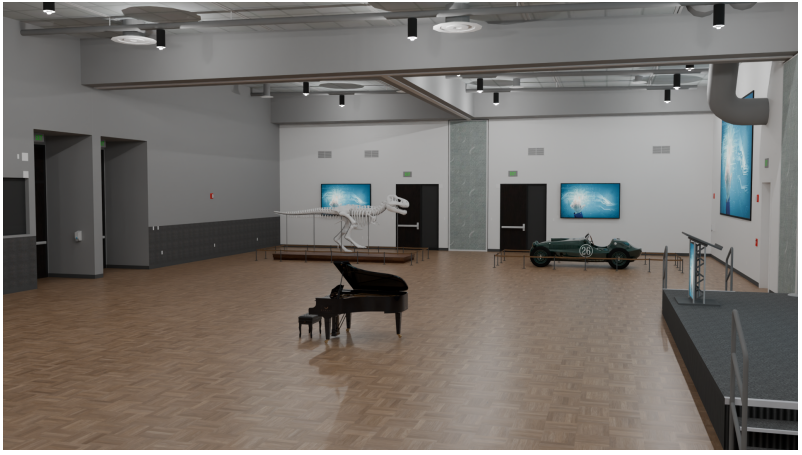
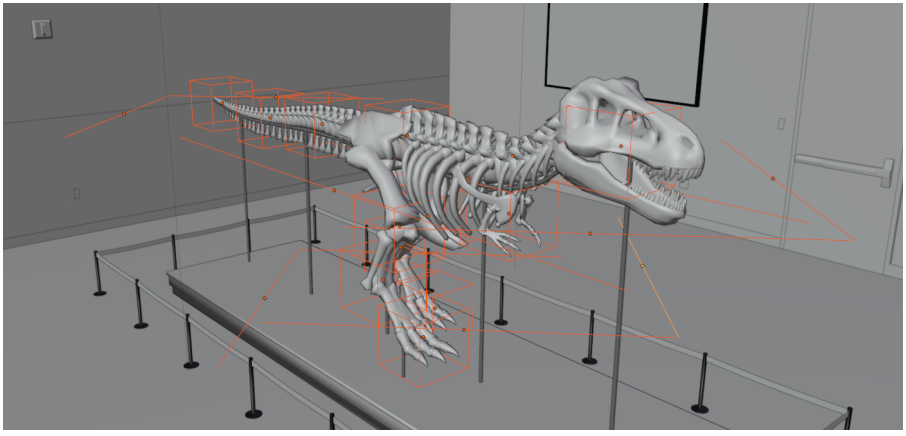
New Dataset (1/4)

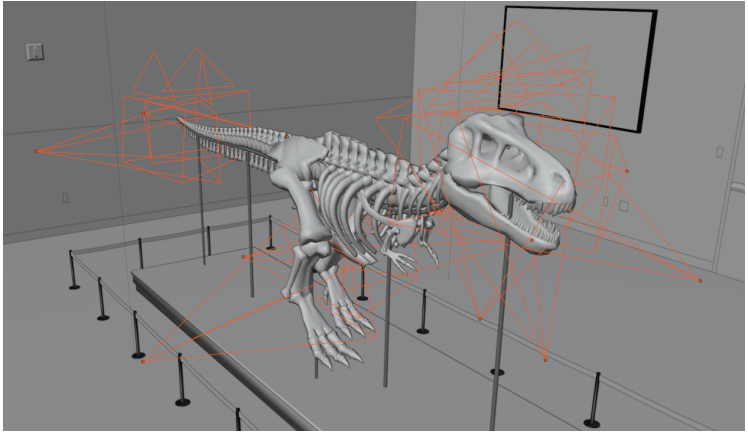
New Dataset (2/4)



New Dataset (3/4)



New Dataset (4/4)



New Dataset: Credits

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- "Frazer Nash Le Mans" (https://skfb.ly/pDP6y) by Kryox Shade is licensed under Creative Commons Attribution (http://creativecommons.org/licenses/by/4.0/).
- ground texture from "The Mardou museum" (https://skfb.ly/pqxIz) by OuterspaceSoftware is licensed under Creative Commons Attribution-NonCommercial (http://creativecommons
nc/4.0/).
- "Discovery Hall" (https://skfb.ly/6UQZ8) by nickcramer is licensed under CC Attribution-NonCommercial-NoDerivs (http://creativecommons.org/licenses/by-nc-nd/4.0/).
- "Grand Piano" (https://skfb.ly/6UUnK) by Amatsukast is licensed under CC Attribution-NonCommercial-ShareAlike (http://creativecommons.org/licenses/by-nc-sa/4.0/).
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New Architecture: StereoDiffusion [4]

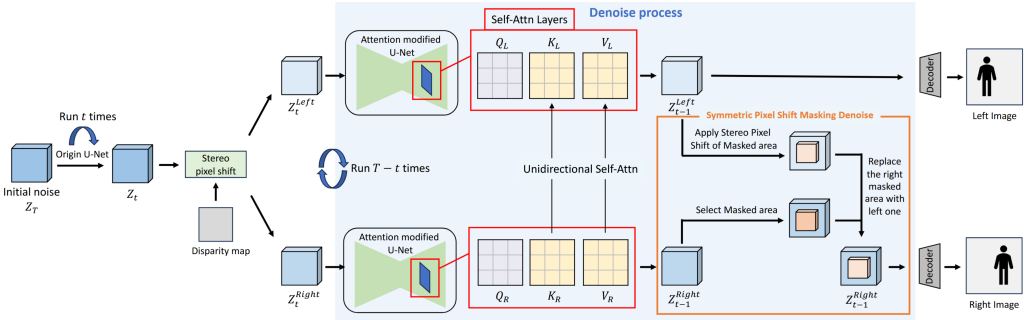

Figure: From [4]

StereoDiffusion: General Characteristics

- Training-free: utilizes pretrained DPT [1] and StableDiffusion [2] without fine-tuning
- TODO

StereoDiffusion: Stereo Pixels Shift

Theirs
TODO

Ours
TODO

Qualitative Analysis: Input and Gold Output

TODO

Qualitative Analysis: Their Result

Figure: Stereo images generated with StereoDiffusion + disparity map from DPT

Qualitative Analysis: Our Result

Figure: Stereo images generated with StereoDiffusion + depth map from DPT + sensor data

Qualitative Analysis: Our Result with Modified Baseline Distance

TODO

Qualitative Analysis: Their Result Deblurred

TODO

Possible Improvements

- switch to a better/state-of-the-art monocular depth estimation model (see for example [3, 5])
- TODO

[1] Ranftl, René, Alexey Bochkovskiy & Vladlen Koltun (2021). *Vision Transformers for Dense Prediction*. https://arxiv.org/abs/2103.13413.

[2] Rombach, Robin, Andreas Blattmann, Dominik Lorenz, Patrick Esser & Björn Ommer (2022). *High-Resolution Image Synthesis with Latent Diffusion Models*. https://arxiv.org/abs/2112.10752.

[3] Sun, Boyuan, Modi Jin, Bowen Yin & Qibin Hou (2025). *Depth Anything at Any Condition*. https://arxiv.org/abs/2507.01634.

[4] Wang, Lezhong, Jeppe Revall Frisvad, Mark Bo Jensen & Siavash Arjomand Bigdeli. 2024. StereoDiffusion: Training-Free Stereo Image Generation Using Latent Diffusion Models. In *2024 IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 7416–7425. DOI: 10.1109/cvprw63382.2024.00737.

[5] Zhang, Jiuling (2025). *Survey on Monocular Metric Depth Estimation*. https://arxiv.org/abs/2501.11841.