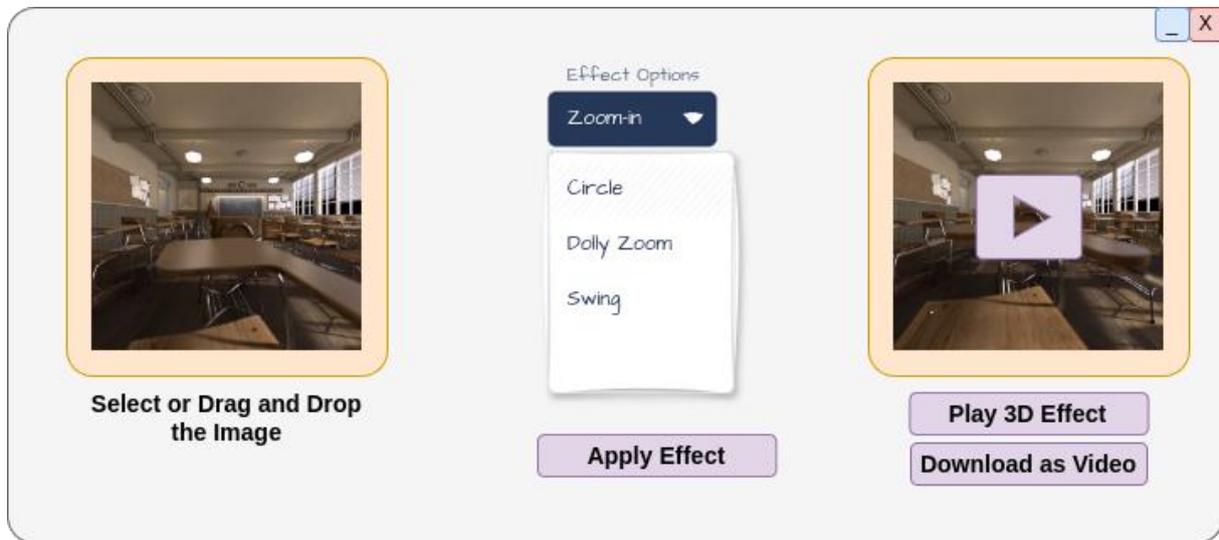


Creating 3D Photos with Novel View Synthesis



Background

With the increasing demand for immersive media, transforming ordinary 2D images into 3D photos can significantly enhance the viewer's experience, creating a sense of depth and realism. Novel View Synthesis (NVS) enables this by simulating different camera movements on a single 2D image, allowing for engaging 3D photo effects without requiring complex capture setups. This technology can be applied to produce interactive 3D visuals with effects like zoom-in, circular panning, swing, and dolly zoom, opening new possibilities in media and entertainment.

Problem Specification

Generating immersive 3D photos from a single image requires a method that balances computational efficiency with high-quality visual output. The project aims to develop a user-friendly graphical interface (GUI) that allows users to upload a single image and select a 3D photo effect. The effects should include various camera movements—zoom-in, circular pan, swing, and dolly zoom—each adding unique dimensionality to the image. The challenge is to implement a streamlined process where a selected NVS model generates these effects quickly, providing users with a visually consistent and smooth 3D experience.

Suggested Method

This project will involve building a GUI application where users can easily upload an image, select the desired 3D photo effect, and view the results. The app will integrate with an existing NVS model, capable of transforming single images into immersive 3D visuals. The application will support different effects (zoom-in, circle, swing, and dolly zoom), which will be generated as short videos. The NVS model will be optimized for quick rendering. Evaluation metrics will focus on the quality of generated videos (e.g., mean opinion score on quality of outputs) and the app's usability.

Relevant Articles

- [1] Numair Khan, Tiled multiplane images for practical 3d photography. In Proceedings of the IEEE/CVF International Conference on Computer Vision. ([GitHub](#))
- [2] Luvizon, D.C., 2021. Adaptive multiplane image generation from a single internet picture. In Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision.
- [3] Mingfang Zhang, . Structural multiplane image: Bridging neural view synthesis and 3d reconstruction. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition. ([GitHub](#))
- [4] Guo Pu, Sinmpi: Novel view synthesis from a single image with expanded multiplane images. In SIGGRAPH Asia 2023 Conference Papers, pages 1–10, 2023. ([GitHub](#))

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