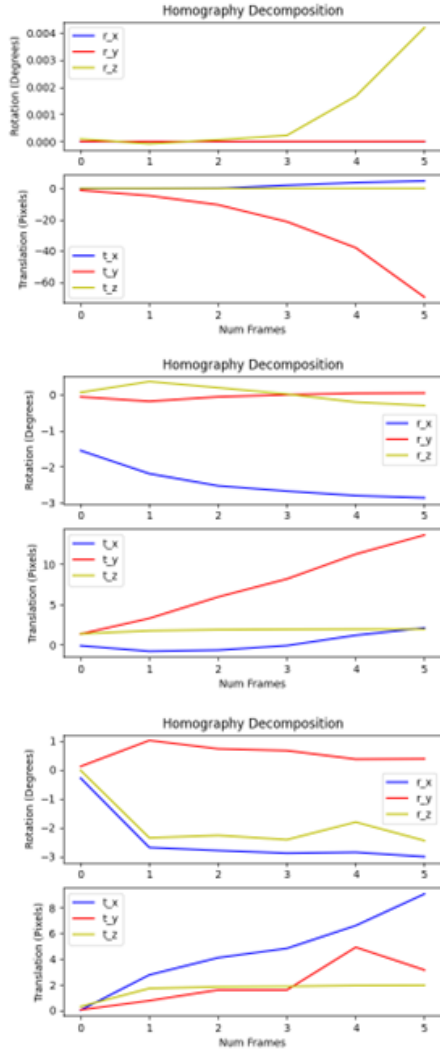


# Supplementary Material

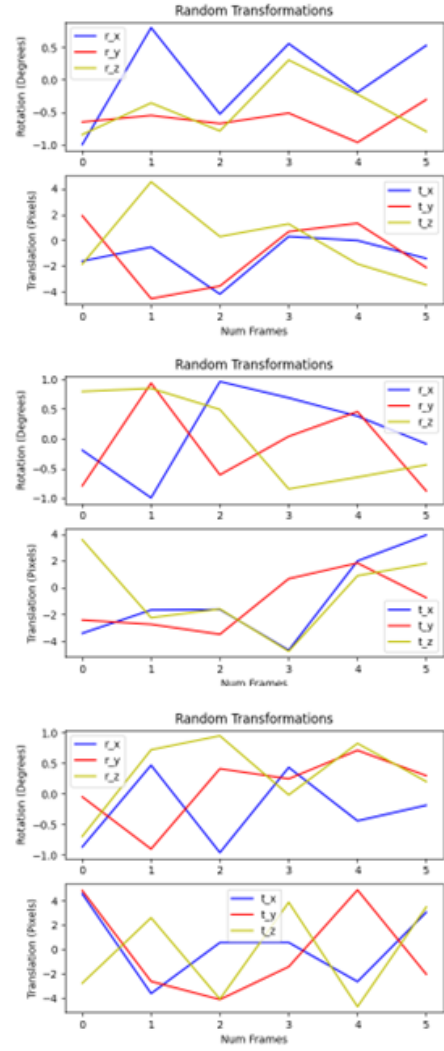
## 1. Synthetic Data Engine

We provide more details of our synthetic data engine. Figure 1 provides more examples of the temporal and spatial correlation of motion within a multi-frame data capture. Figure 2 shows visual results for the SOTA model in MFSR [1] trained on our dataset with motion sampled from a uniform distribution of rotations and translations against sam-

pling from a dataset of real handheld homography matrices.



Sampling transformation from distribution of real handheld burst photography homographies



Sampling transformation from a uniform distribution of pre-defined parameters

Figure 1. Sampling transformations from a uniform distribution of pre-defined rotations and translation parameters (right) versus sampling transformations from a dataset of homography matrices defining the transformations within a real handheld burst photography capture (left). Uniform distribution sampling does not contain spatial and temporal correlations found in real handheld motion.



Burststormer trained on our dataset but with motion vectors sampled from a uniform distribution

Burststormer trained on our dataset using motion vectors sampled as per our synthetic data engine

Figure 2. Burststormer [2] trained on our dataset with motion vectors sampled from a uniform distribution of pre-defined rotations and translation parameters (left) versus Burststormer trained on the same dataset but with motion vectors sampled from a dataset of homography matrices defining the transformations within a real handheld burst photography capture as per our synthetic data engine (right). All experimental conditions identical.

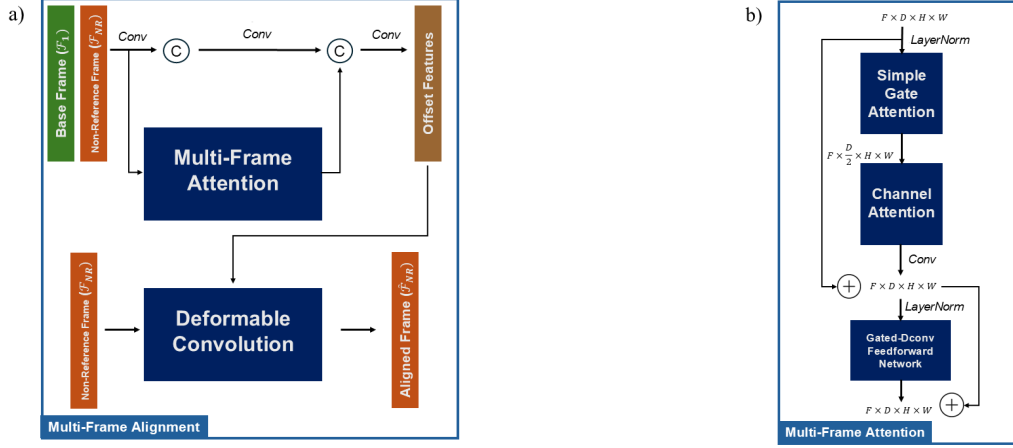


Figure 3. MFSR-GAN modules for (a) Multi-Frame Alignment, and (b) Multi-Frame Attention. Descriptions in Section ??.

## 2. Model Architecture Details

We provide more details for our model architecture previously introduced in Section 4. Our model architecture builds upon the work previously completed for MFSR by [2]. Our adaptations of the Multi-Frame Alignment and Multi-Frame Attention modules are presented in Figure 3 with descriptions in Section 4.2.2.

## References

- [1] Akshay Dudhane, Syed Waqas Zamir, Salman Khan, Fahad Shahbaz Khan, and Ming-Hsuan Yang. Burst Image Restoration and Enhancement. In *2022 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 5749–5758, 2022. ISSN: 2575-7075. 1
- [2] Akshay Dudhane, Syed Waqas Zamir, Salman Khan, Fahad Shahbaz Khan, and Ming-Hsuan Yang. Burstormer: Burst Image Restoration and Enhancement Transformer. In *2023 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 5703–5712, 2023. ISSN: 2575-7075. 2, 3