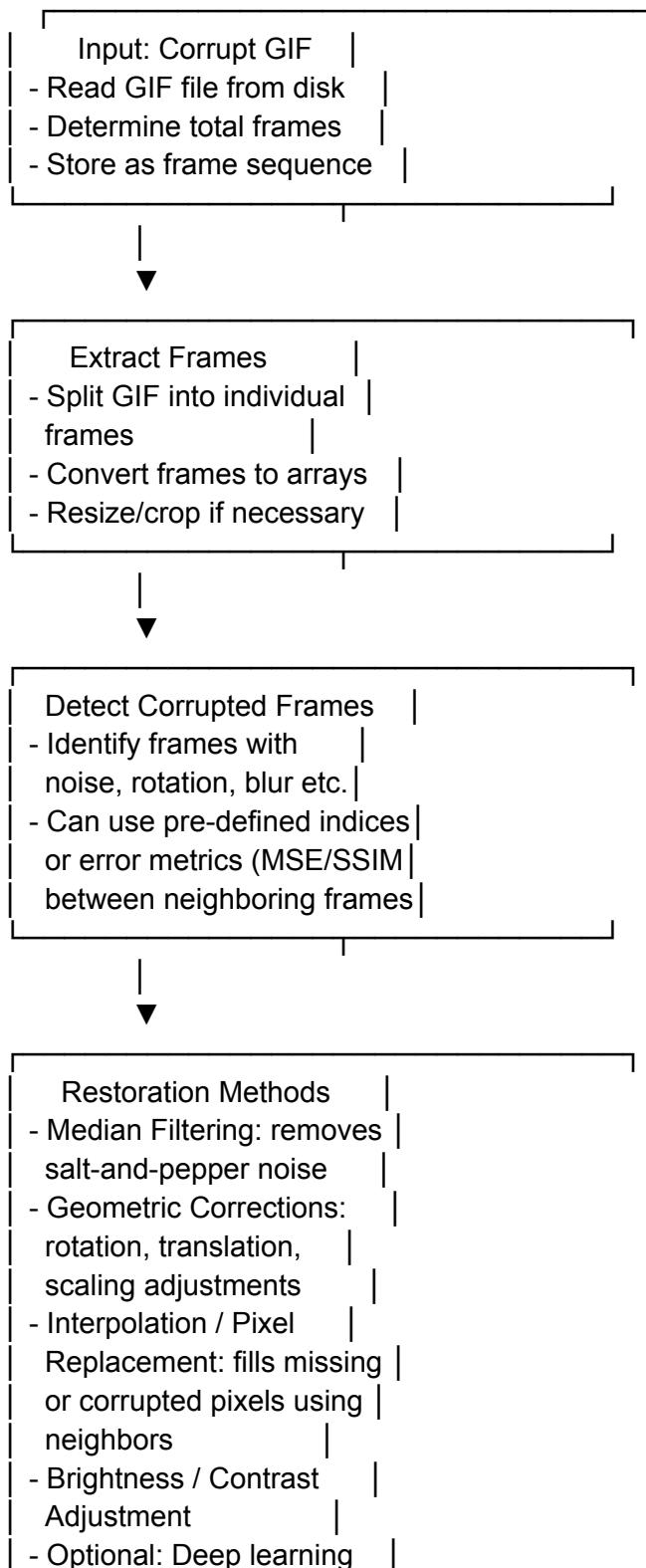
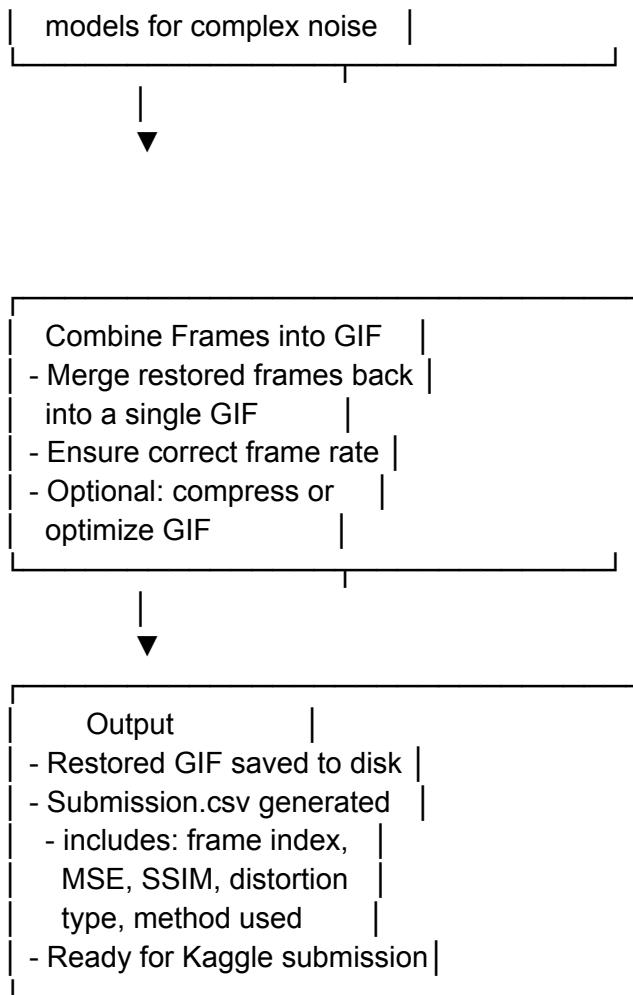


Section - C

1)





2)

Method	Purpose	Advantages
Mask-based Inpainting	Replace damaged regions using uncorrupted parts of nearby frames	<ul style="list-style-type: none"> - Simple and effective for local occlusions - Can handle small missing or corrupted regions
Rotation + Affine Transformation Correction	Undo geometric distortions	<ul style="list-style-type: none"> - Restores alignment and structure - Preserves motion continuity in sequences

Median Filtering	Remove salt-and-pepper (impulse) noise	- Preserves edges better than simple averaging- Fast and simple to implement
Bilateral Filtering	Smooth while preserving edges	- Excellent for noise near edges- Maintains structural details while reducing noise
Frame Averaging (Temporal Interpolation)	Reconstruct missing frames by averaging neighbors	- Leverages temporal continuity- Smooths out small corruptions in consecutive frames

3)

Corrupted Frame 0



Restored Frame 0



Corrupted Frame 4



Restored Frame 4



Corrupted Frame 9



Restored Frame 9



Corrupted Frame 14



Restored Frame 14



Corrupted Frame 18



Restored Frame 18



Corrupted Frame 23



Restored Frame 23



Corrupted Frame 28



Restored Frame 28

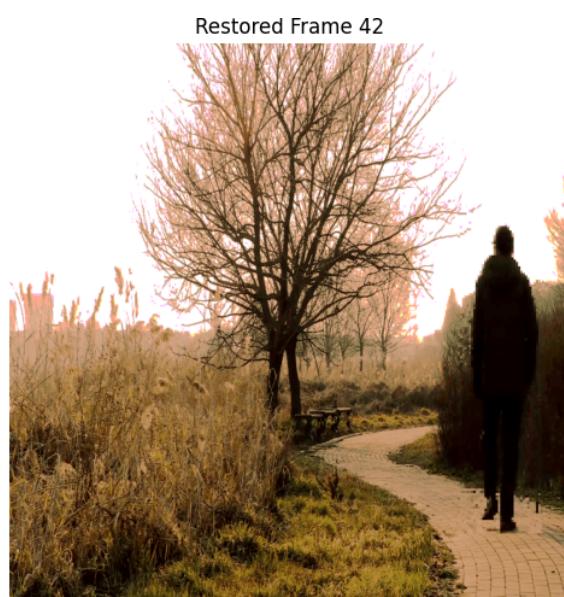
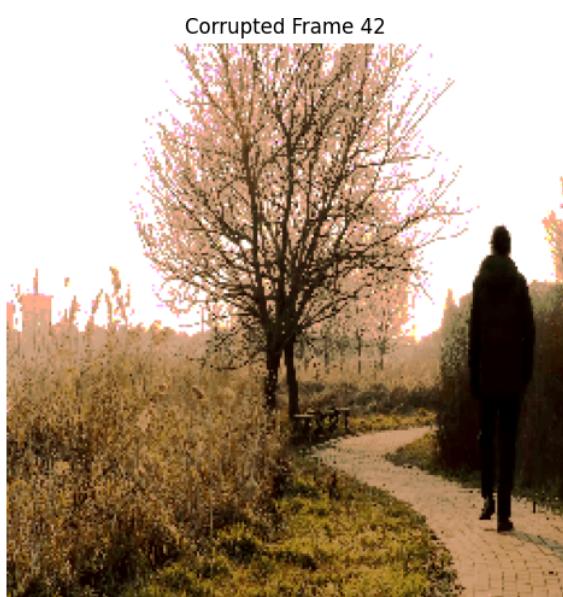
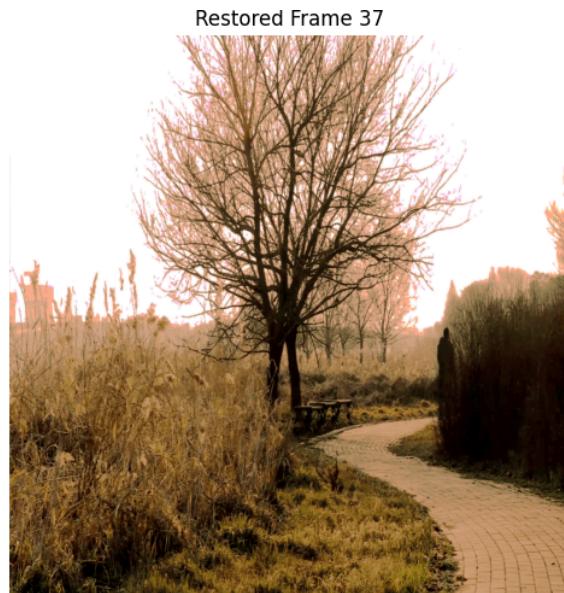
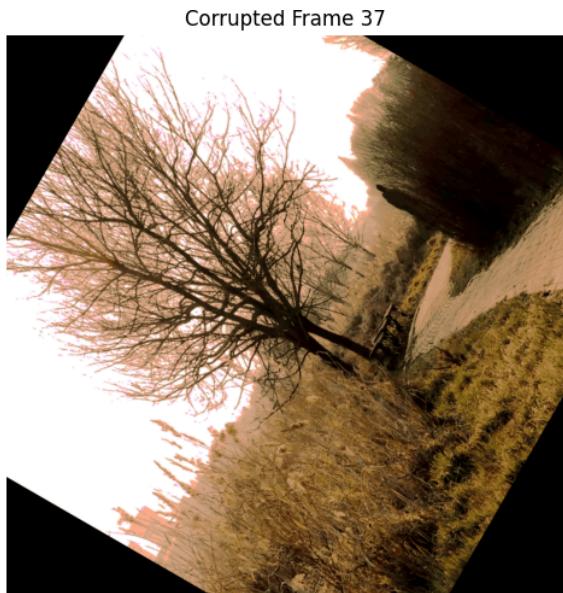


Corrupted Frame 32



Restored Frame 32





Frame	MSE	SSIM
Frame 1	178.539	0.8224
Frame 2	18272.60	0.0658
	1	
Frame 3	410.917	0.6392
Frame 4	155.115	0.8221
Frame 5	321.471	0.6117
Frame 6	565.821	0.7634

Frame 7	802.113	0.6441
Frame 8	1225.358	0.4509
Frame 9	13039.00 3	0.1497
Frame 10	1063.484	0.4951

Frame	Distortion Factor / Noise Type	Restoration Method Applied
1	Salt-and-pepper noise	Median Filtering
2	Gaussian noise	Median Filtering or smoothing filter
3	Missing/corrupt frame	Frame Interpolation using neighboring frames
4	Rotation (geometric transformation)	Geometric Correction (rotation by estimated angle)
5	Translation / misalignment	Geometric Correction (shift using neighboring frames)
6	Combined noise (salt-and-pepper + blur)	Median Filtering + Pixel Replacement
7	Color distortion / brightness variation	Histogram matching or pixel adjustment
8	Scaling / resizing artifacts	Geometric Correction (scaling adjustment)
9	Missing blocks / pixel corruption	Pixel Replacement from neighboring frames
10	Compression artifacts / JPEG-like block noise	Median Filtering + slight smoothing

My method is effective because it **adapts restoration techniques to each type of corruption**, rather than using a single generic filter:

1. **Frame-specific approach:** Each corrupted frame is treated according to its distortion type (noise, rotation, missing pixels), which preserves detail and reduces artifacts.

2. **Median filtering for noise:** Removes salt-and-pepper and Gaussian noise without over-blurring edges.
3. **Geometric correction for misalignments:** Corrects rotations and translations precisely using neighboring frames as references.
4. **Frame interpolation and pixel replacement:** Seamlessly restores missing or corrupted areas by leveraging spatial and temporal information.
5. **Combined pipeline:** Integrating multiple methods ensures robustness against diverse distortions, achieving higher visual quality and better quantitative metrics (MSE, SSIM).

Enhancements over naive methods:

- Instead of applying a uniform filter to all frames (which can blur or distort the video), we **detect the type of corruption per frame** and apply the optimal restoration strategy.
- Using **neighboring frames for interpolation** reduces ghosting and maintains temporal coherence.
- This modular approach also allows easy extension if new types of corruption are found.

If you want, I can also **write this in a polished 1-paragraph version suitable for your report**. Do you want me to do that?

Credits:

<https://chatgpt.com/share/68f12fa9-a8ec-8004-8b7b-8f71f64844c0>
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