Noise Identification and Removal Proof of Concept

This proof of concept only works with video files that are 400x400px. This is due to a limitation in the noise generation and a constant to identify the total number of pixels in the image.

A video file is read in, converted to greyscale using the ITU-R BT.709 standard. Then, noise is added to each frame (both permanent and transient noise).

After this, each frame undergoes fault correction and the result is compared to the original to determine the effectiveness of the reconstruction.

The video is also sampled to identify the locations of the permanent faults. These are reported to the user as well as identified how much of the frame is covered in permanent faults.

Input Array — Identified Permanent Faults
Fault Identification

Overlay
Reference
R
G
B

Test
Ref
Percent Difference
Fault Identification Verification

Frame — Percentage
Permanent Fault Count

$\frac{1}{2}$

R
G
B
psnr
noise
fCount
[fCount]
Display Identified Faults Frame

Outputs frames to a viewer and file. Provides overlay information as well

Image
psnr
fCount
[fCount]
Display Fault Injected Frame

Input Array — Fault Injected Array
Fault Injection

Fault Injected Array — Fault Corrected Array
Fault Correction

Test
Ref
SNR
Verification - 2

Image
psnr
fCount
[fCount]
Display Corrected Frame

Frames - conv.m4v
V: 400x400, 30.0 fps
R
G
B
EOF

Red
Green — Grey
Blue

Rst
Count Up
Cnt
[fCount]
Frame Counter

Test
Ref
SNR
Verification - 1

Provides frame count

Image
fCount
[fCount]
Display Reference