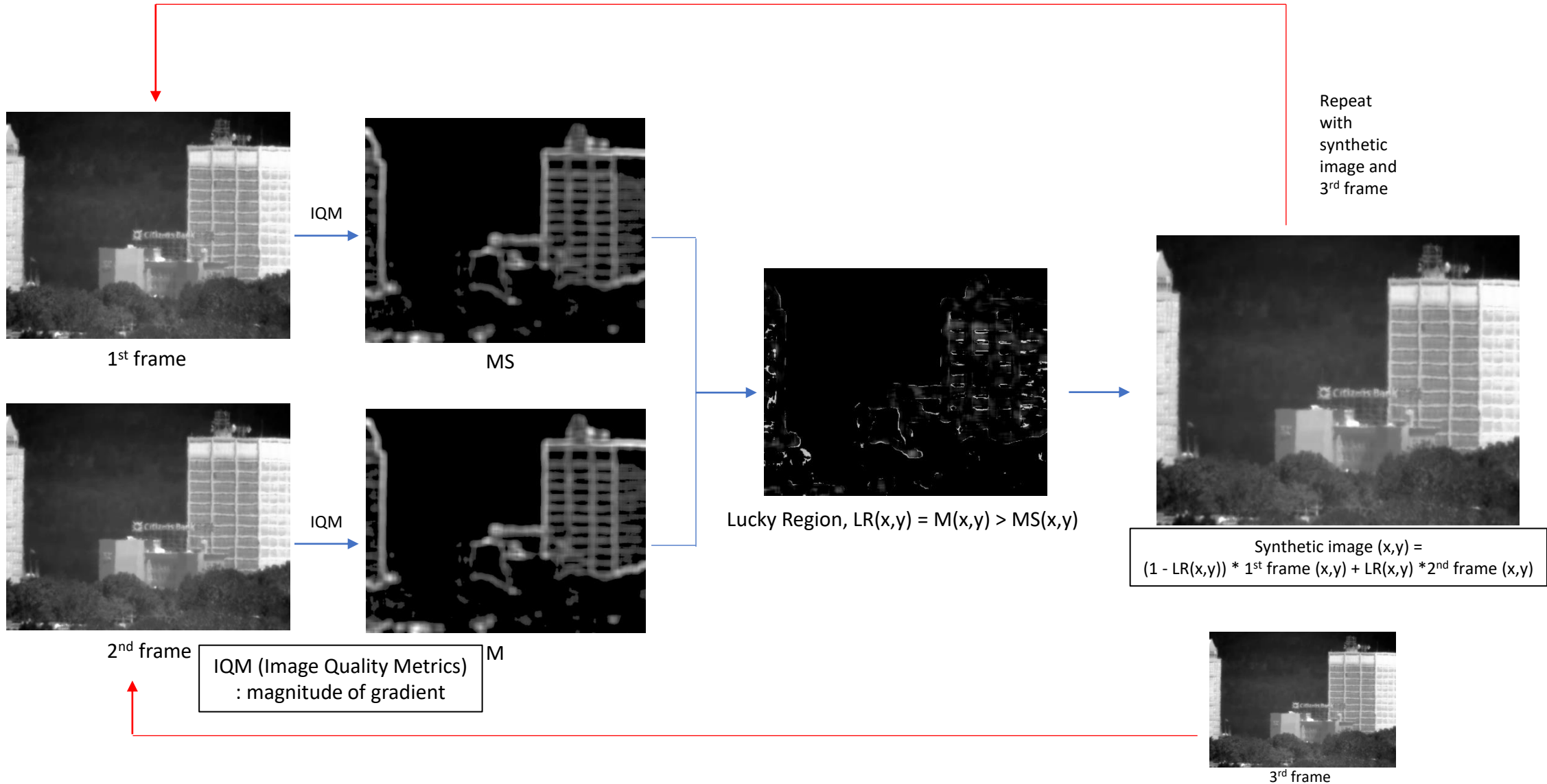# Lucky Region Fusion

By Sang Moon

Lucky region fusion

- Find the sharper regions in the next frame by IQM (image quality metrics).
- Replace the regions in the synthetic image with the sharper regions.
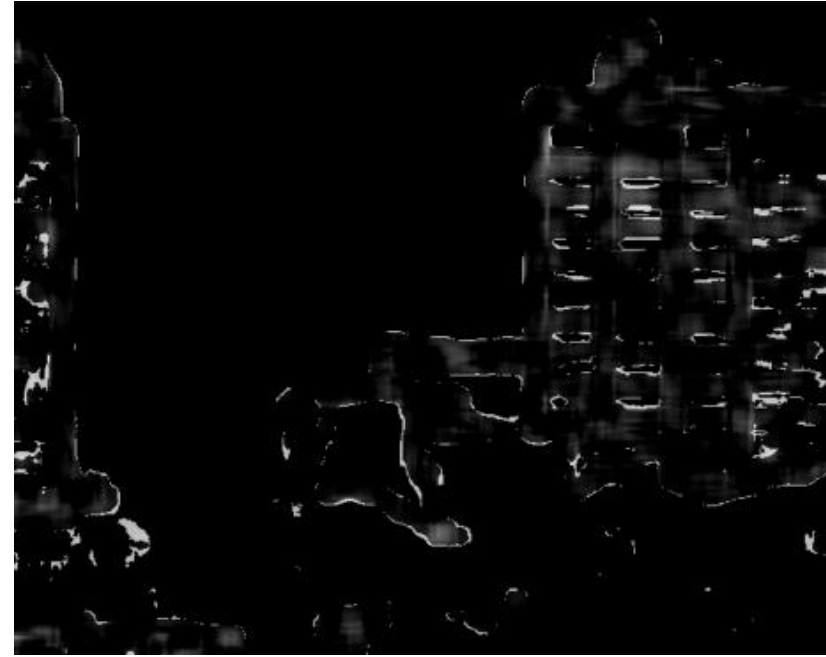- Repeat modifying until the linearity stops improving.

1st frame

MS

IQM

2nd frame

M

IQM

IQM (Image Quality Metrics)
: magnitude of gradient

Lucky Region, LR(x,y) = M(x,y) > MS(x,y)

Repeat with synthetic image and 3rd frame

Synthetic image (x,y) =
(1 - LR(x,y)) * 1st frame (x,y) + LR(x,y) *2nd frame (x,y)

3rd frame

Lucky region fusion

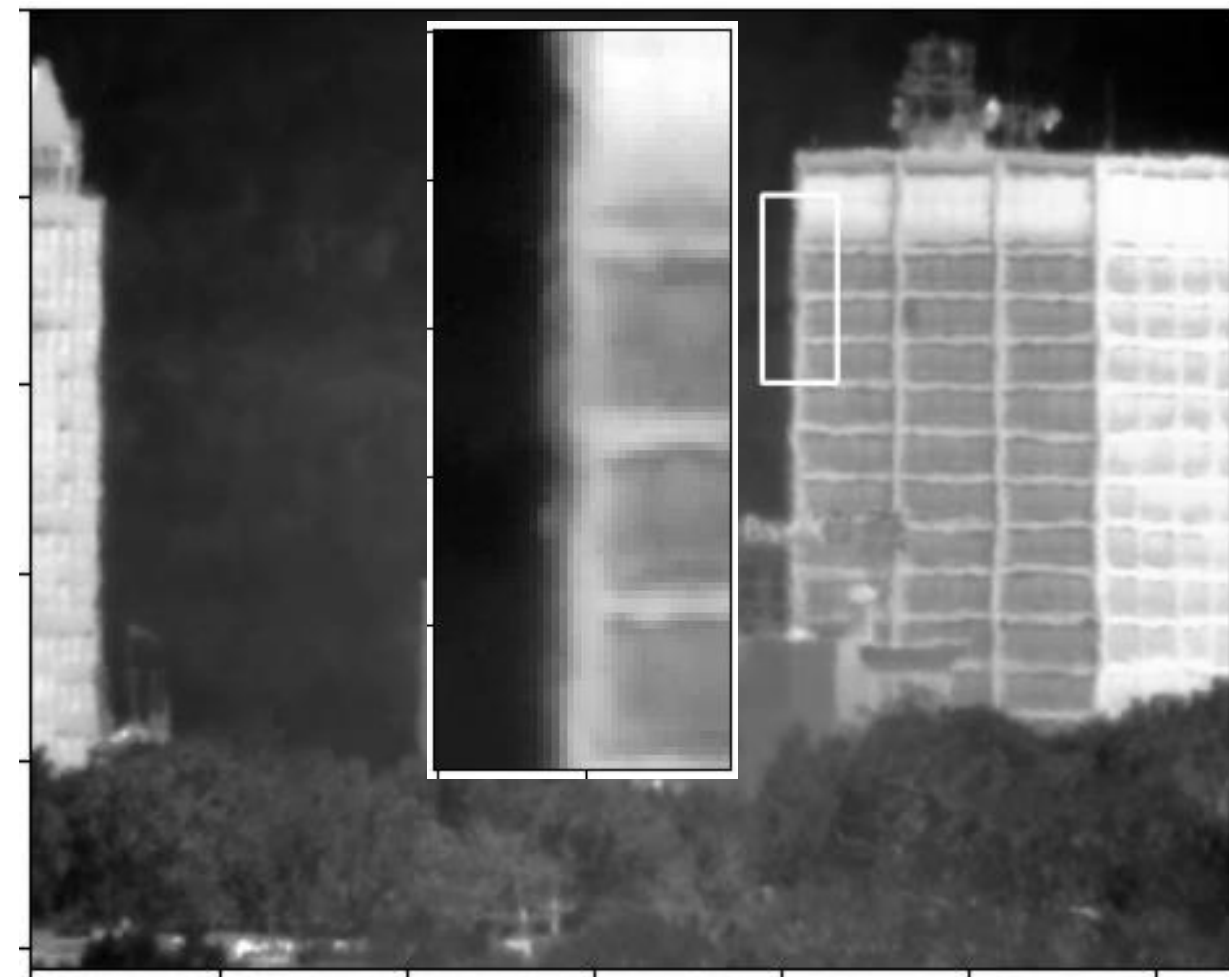8th frame   7th synthetic image   Lucky region

Lucky region fusion

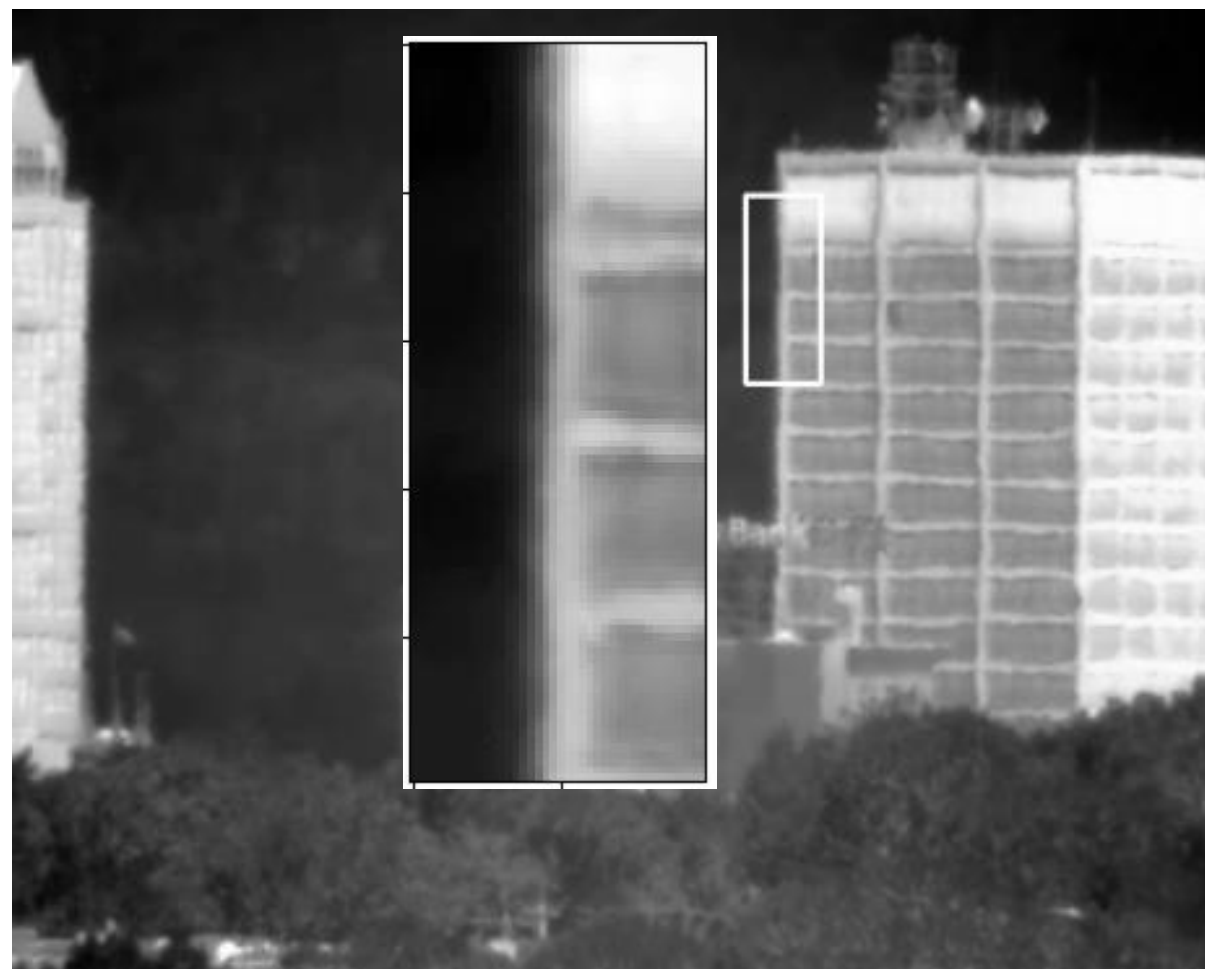Input image (first frame)
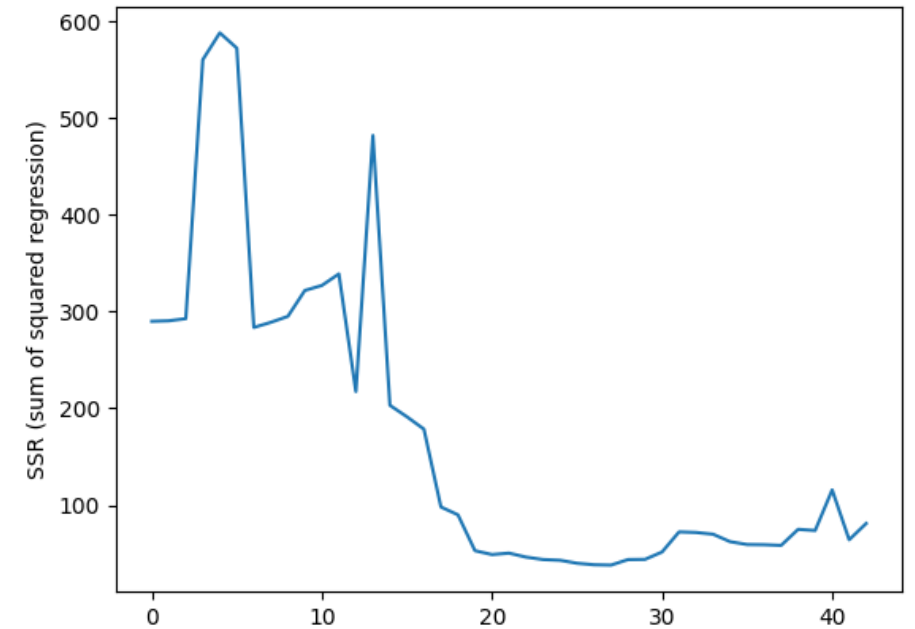
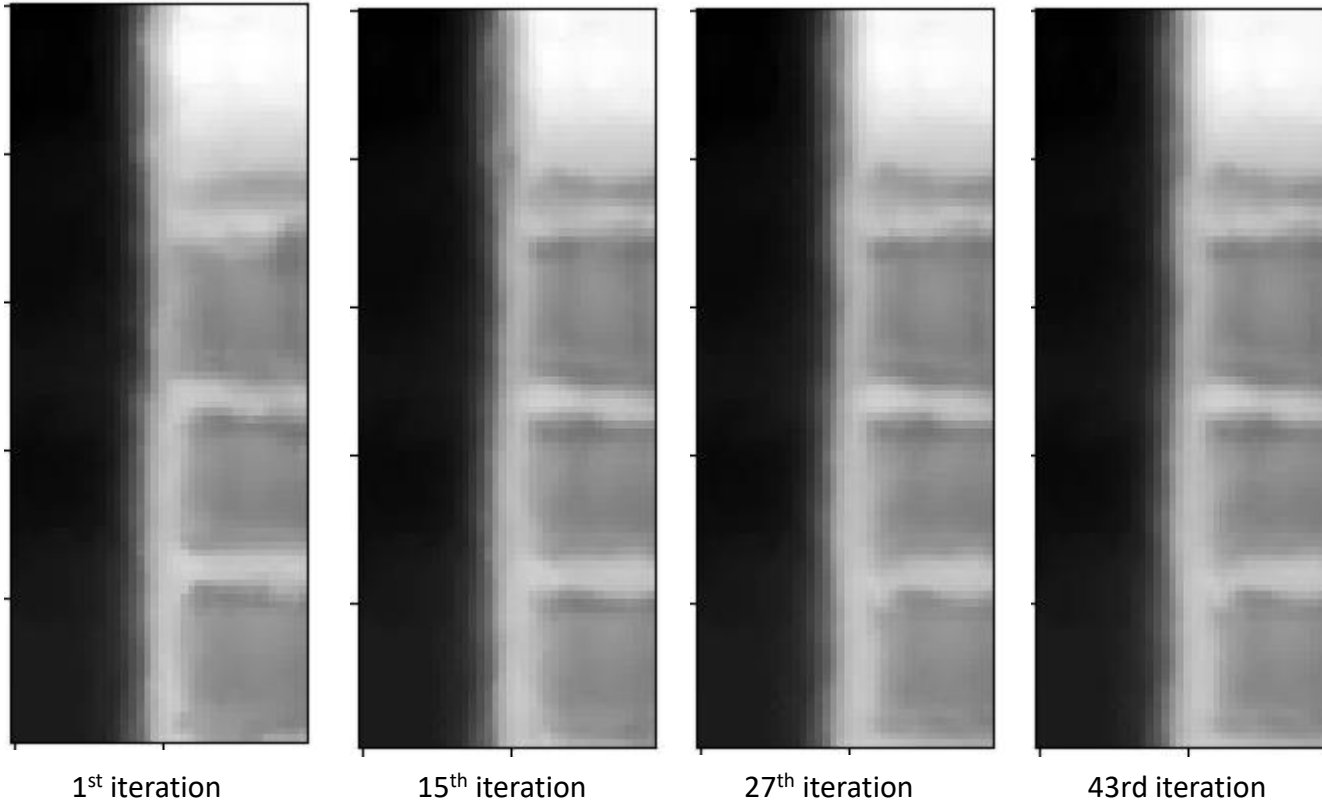Result of Lucky region fusion

Lucky region fusion

Input image (first frame)

Result after 17 iterations

Lucky region fusion

- Deciding number of iteration
  - Need to stop search process because sharpness bounces back to bad.
  - Stop function :
    - If linearity doesn't improve next 15 iterations after it found the lowest, search processes stopped.

| 1st iteration | 15th iteration | 27th iteration | 43rd iteration |

Lucky region fusion

10 iteration

20 iteration

Lucky region fusion

30 iteration

40 iteration