# HDR image reconstruction from a single short-exposure image
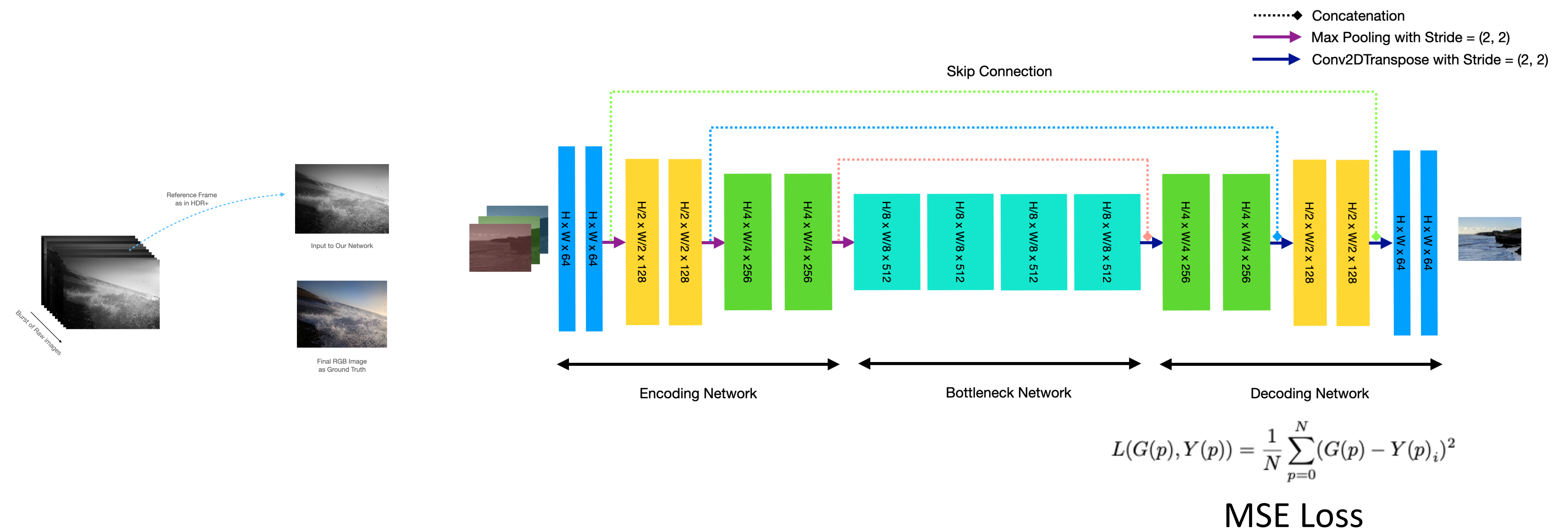
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## Motivation

- Produce High Dynamic Range image from a single RAW image

- Low power

- Low memory footprint

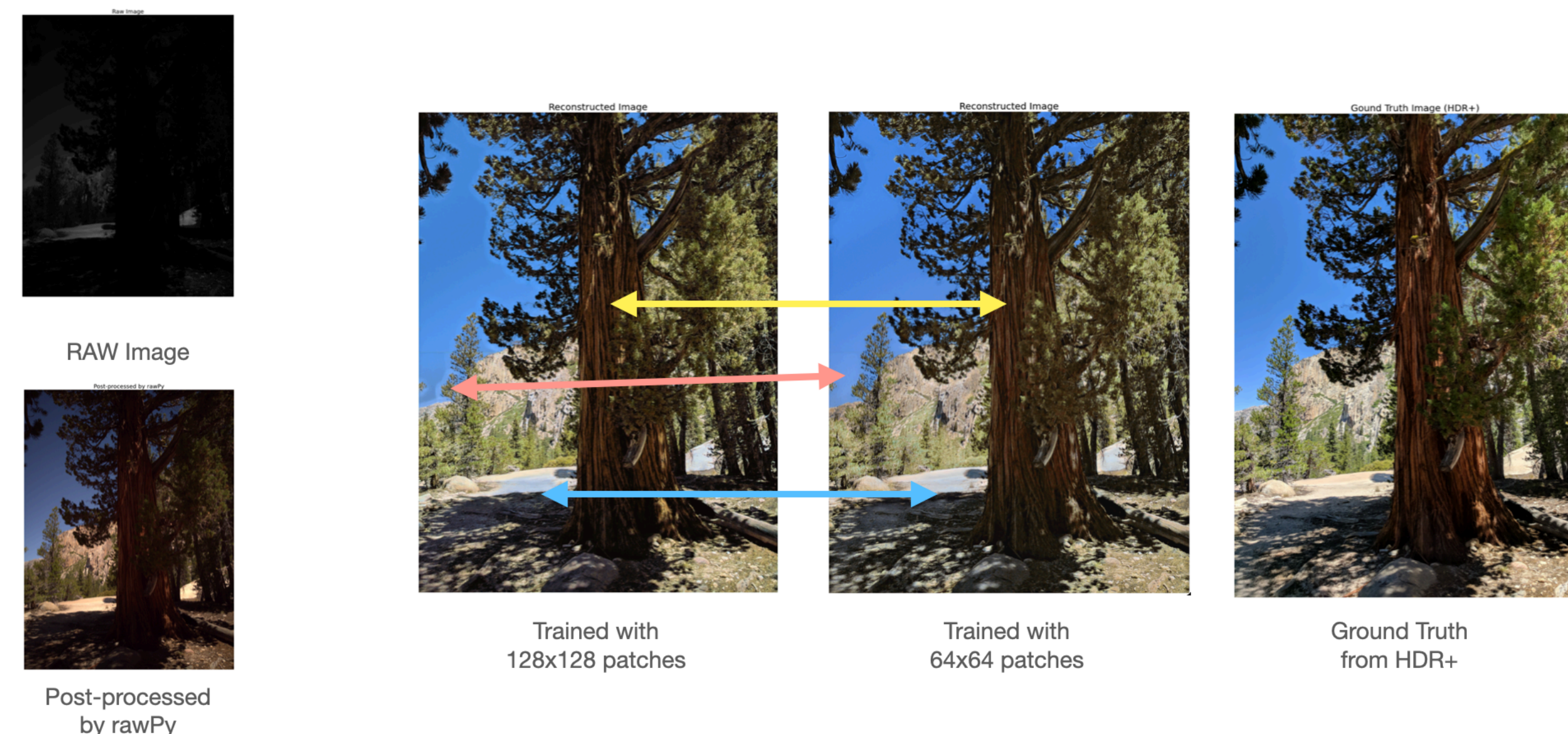- End to end solution suitable for mobile device application

## Proposed HdrNet



$$L(G(p), Y(p)) = \frac{1}{N} \sum_{p=0}^{N} (G(p) - Y(p)_i)^2$$

MSE Loss

## Related Work

- Difficult image fusion process
- Need a burst of images with or without different exposures
- Artifacts
- Not always able to reconstruct the details

## Experimental Results



RAW Image

Post-processed by rawPy

Trained with 128x128 patches

Trained with 64x64 patches

Ground Truth from HDR+

| PatchSize | ssim | psnr |
|-----------|--------|---------|
| 128x128 | 0.5852 | 20.1738 |
| 64x64 | 0.5612 | 19.3351 |

## References

[1] Hasinoff, et al, *Burst photography for high dynamic range and low-light imaging on mobile cameras*, ACM Transactions on Graphics, 2016

[2] SANTOS, et al, Single Image HDR Reconstruction Using a CNN with Masked Features and Perceptual Loss, ACM Trans. Graph. July 2020.

[3] Ronneberger, et al, U-Net: Convolutional Networks for Biomedical Image Segmentation, MICCAI 2015