

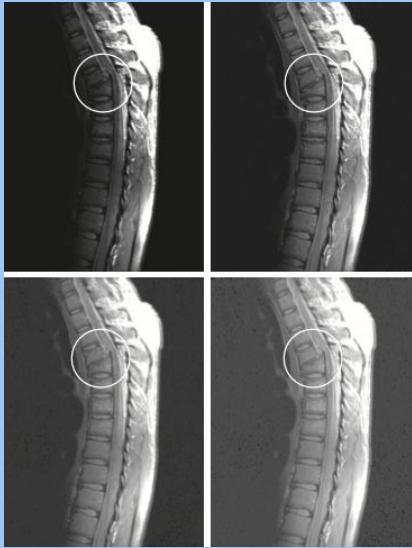
Image Processing

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Shanmugam, Nitali Arora

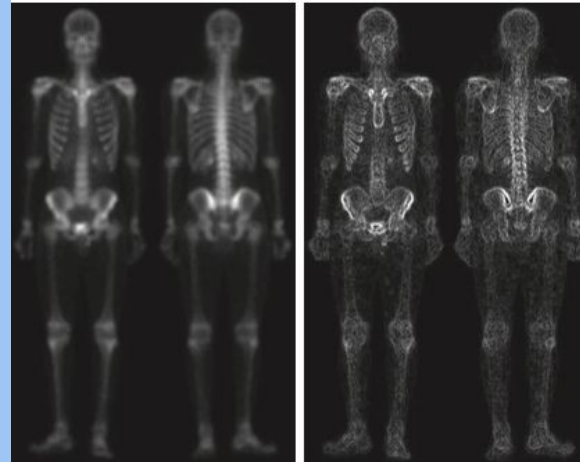
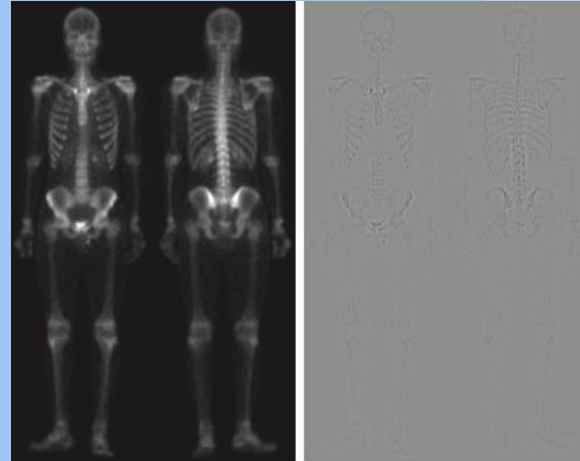


Project Goal Review

Power (Gamma) Law



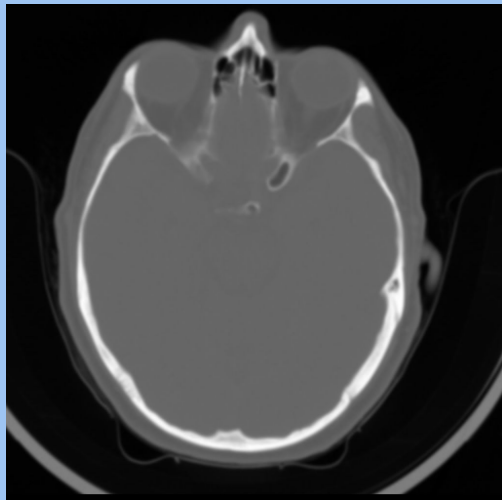
Laplacian Convolution



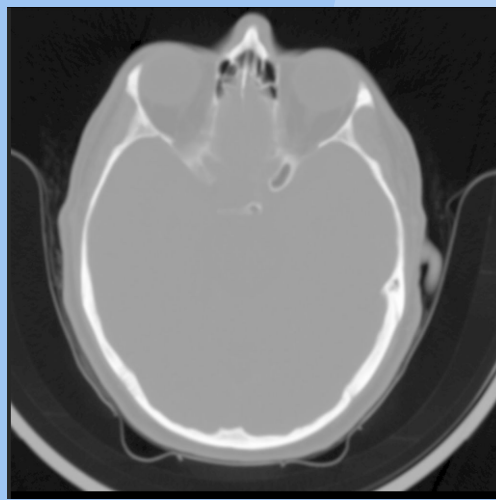
Sobel Convolution

Prototype (C)

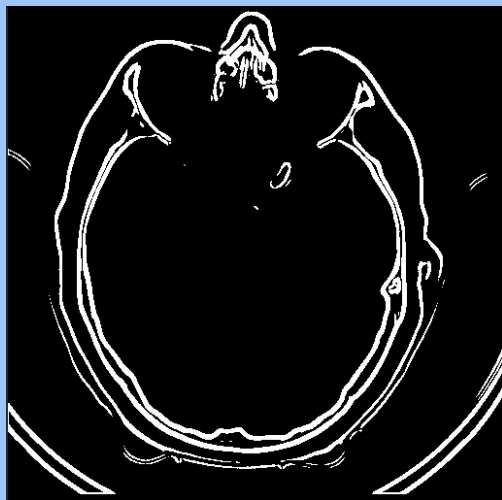
Original
(Normalized)



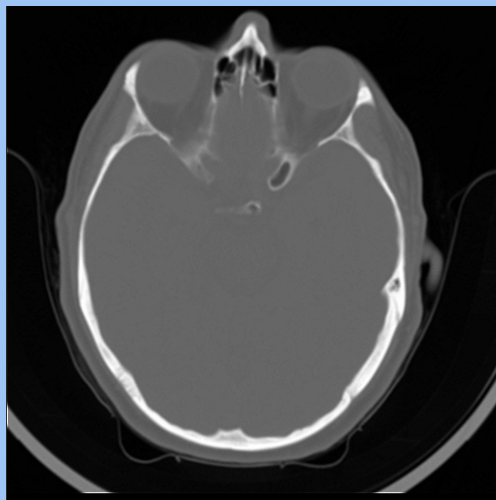
Gamma



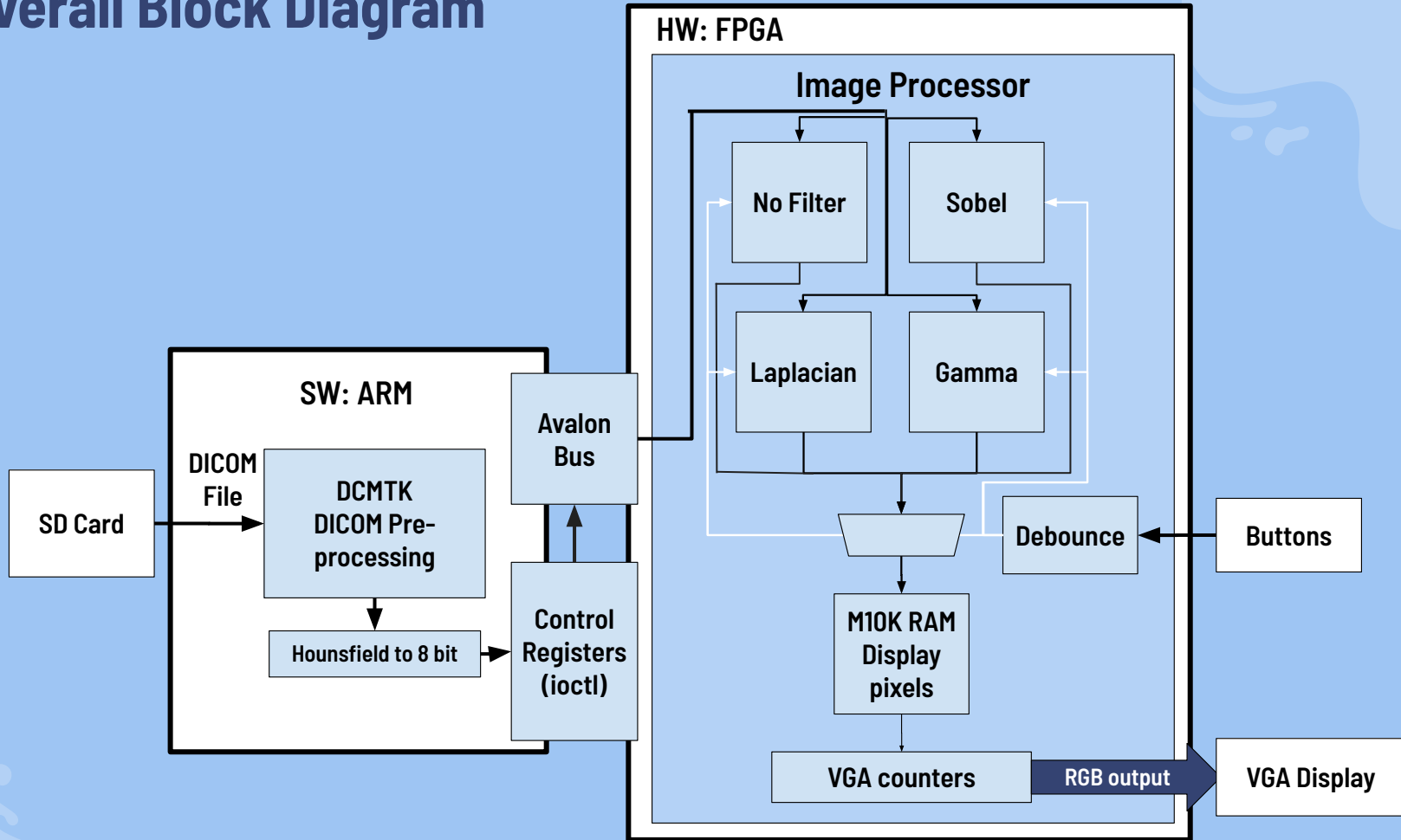
Sobel



Laplacian



Overall Block Diagram



SW



SW & HW - Register Map

Byte Offset	Name	Description
0	ipa	Image pixel at index 0
1	ipa	Image pixel at index 1
...
0x3FFF	ipa	Image pixel at index 16383

Image Data - M10K blocks

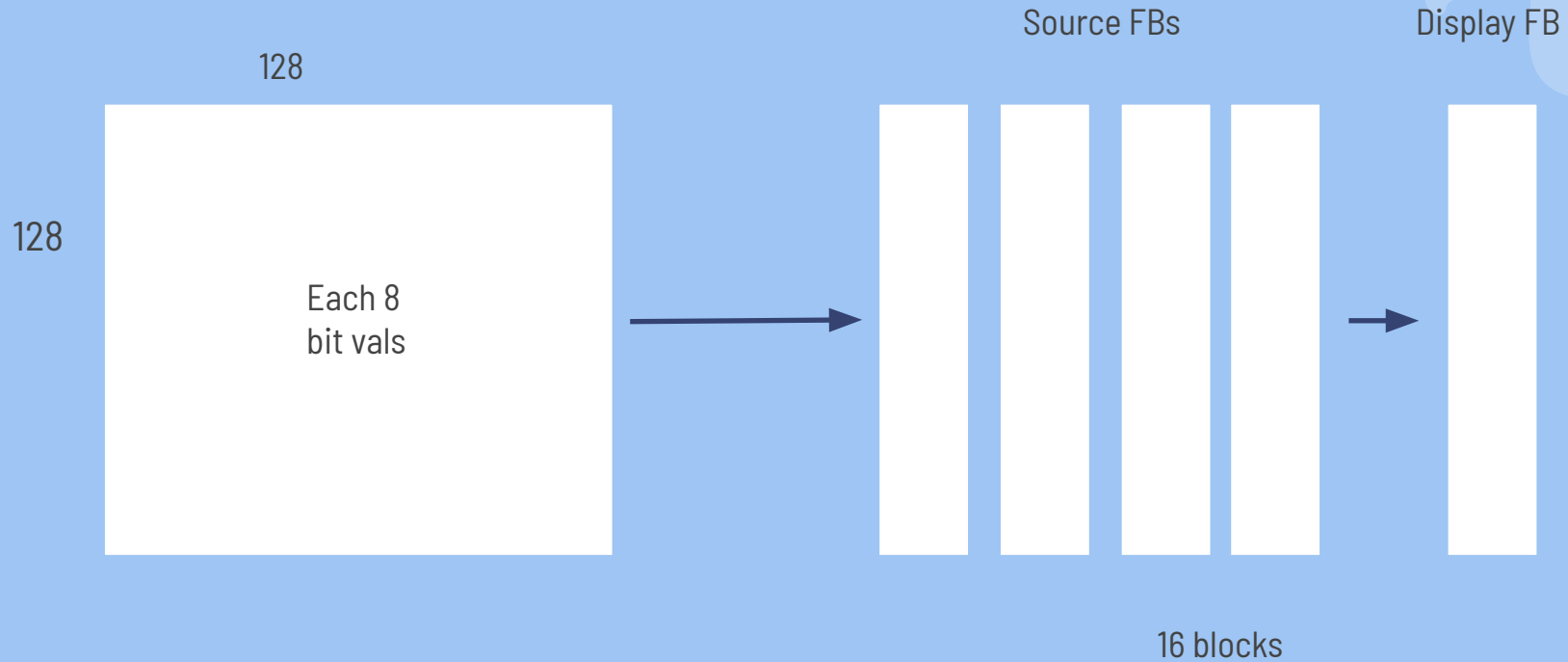
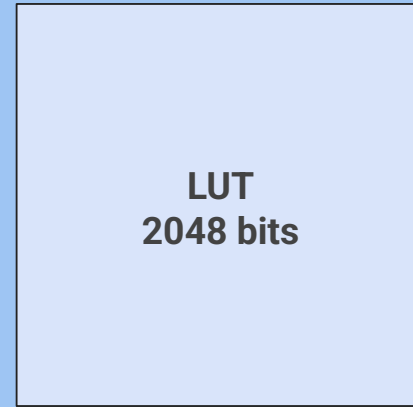
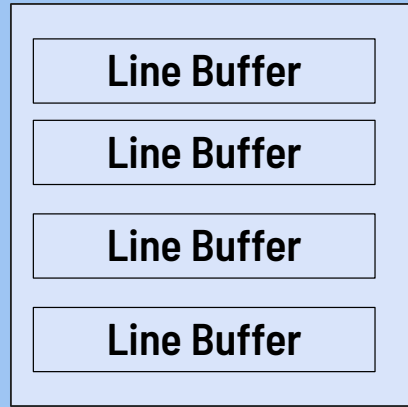
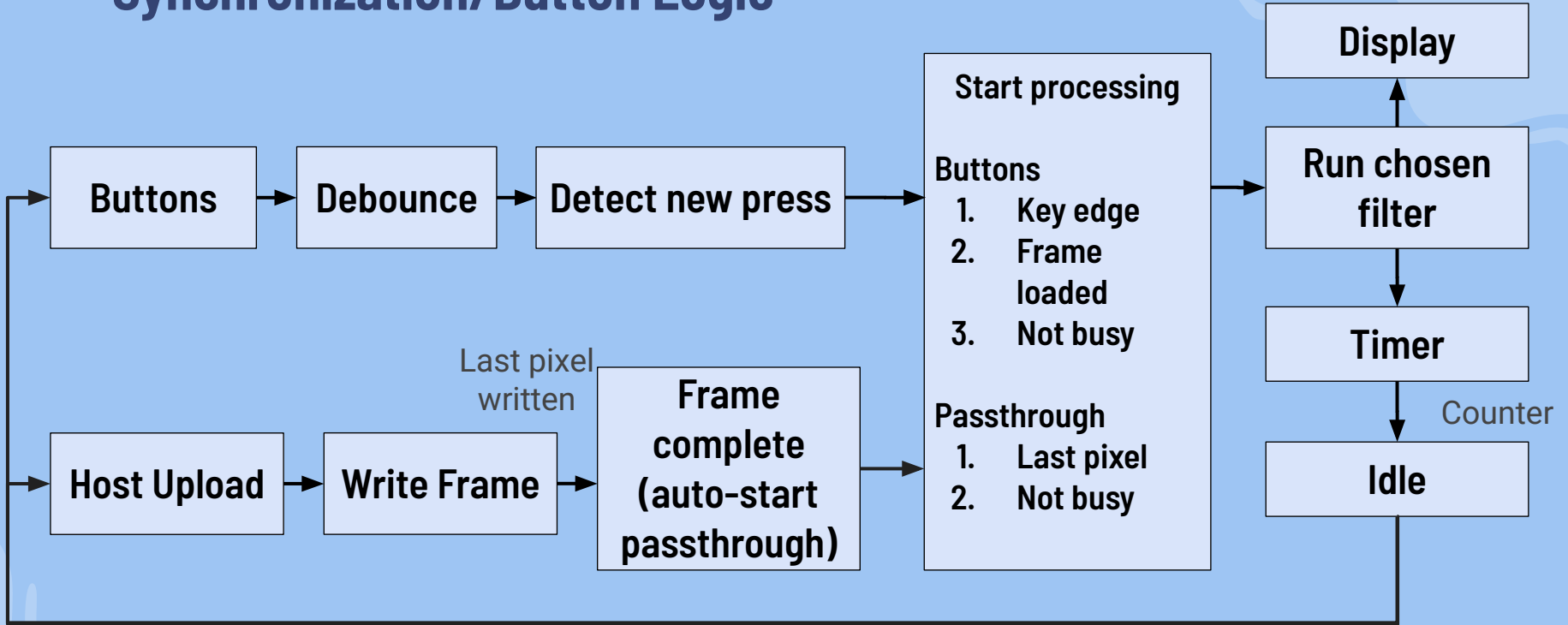


Image Data

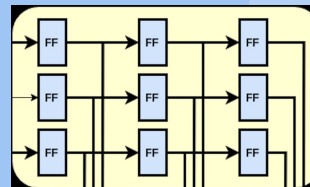


$$2 \times 4 \times 128 \times 8 = 8192 \text{ bits}$$

Synchronization/Button Logic

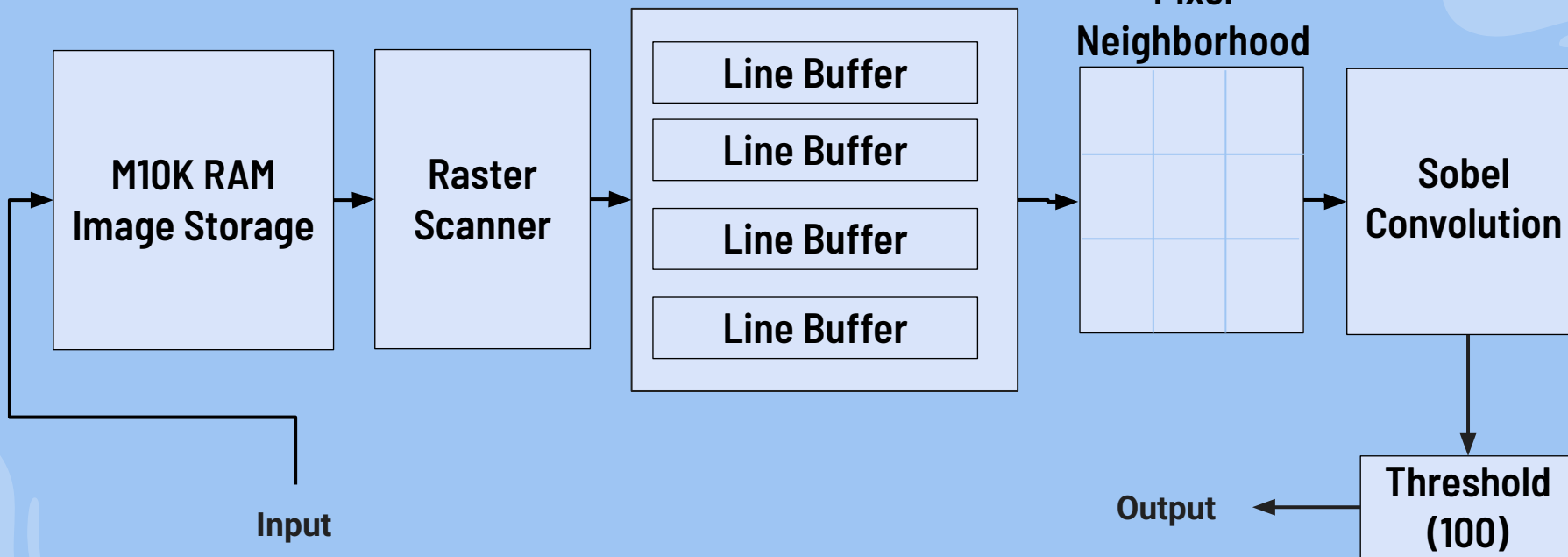


Module - Sobel

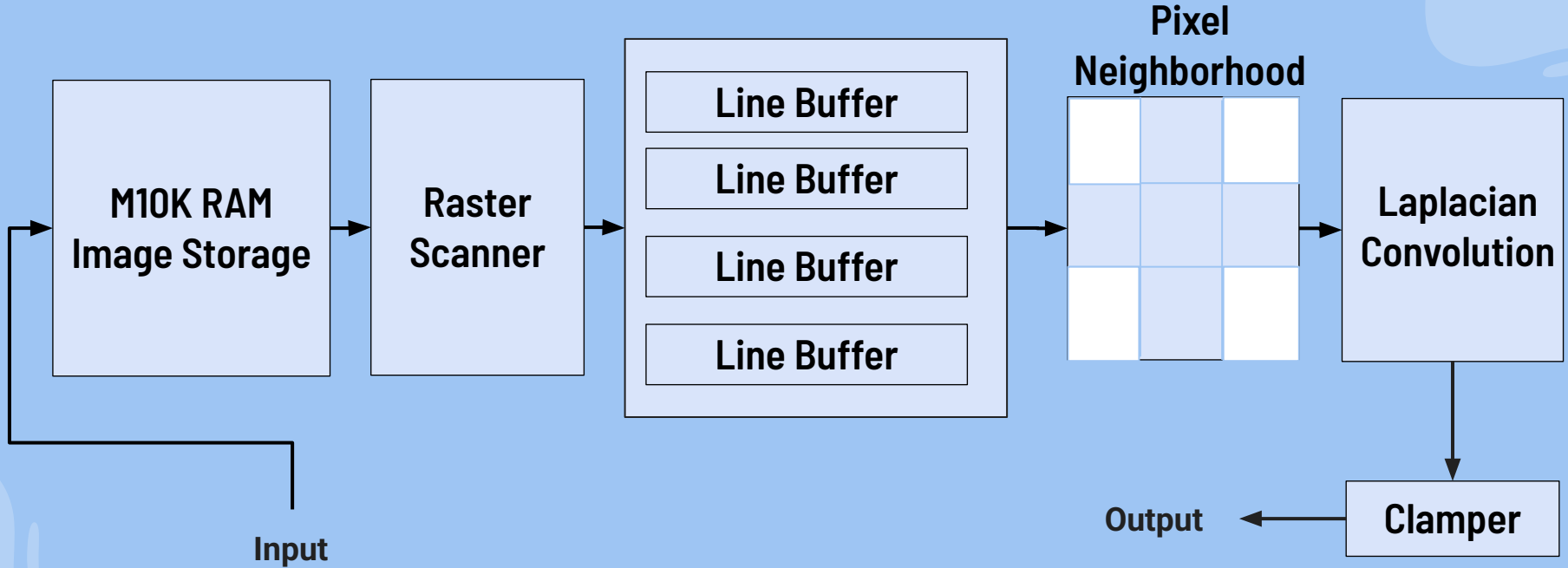


Pixel

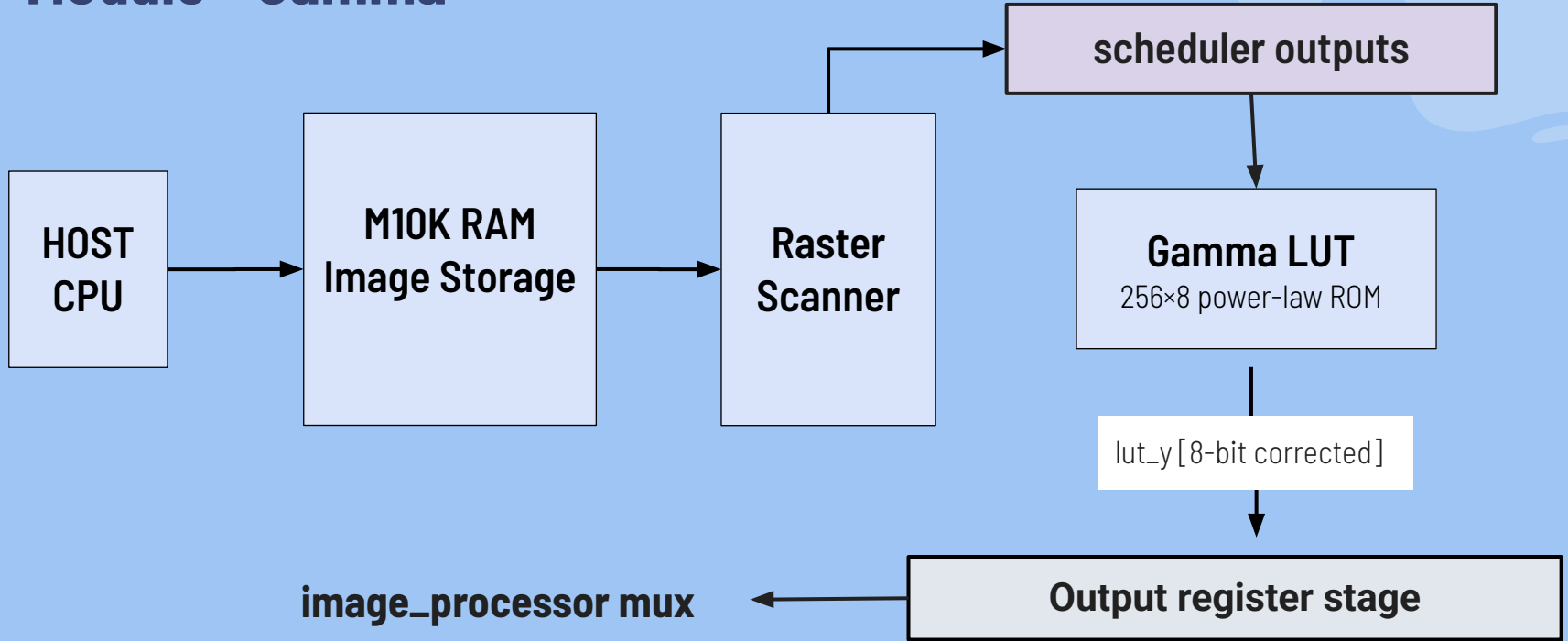
Neighborhood



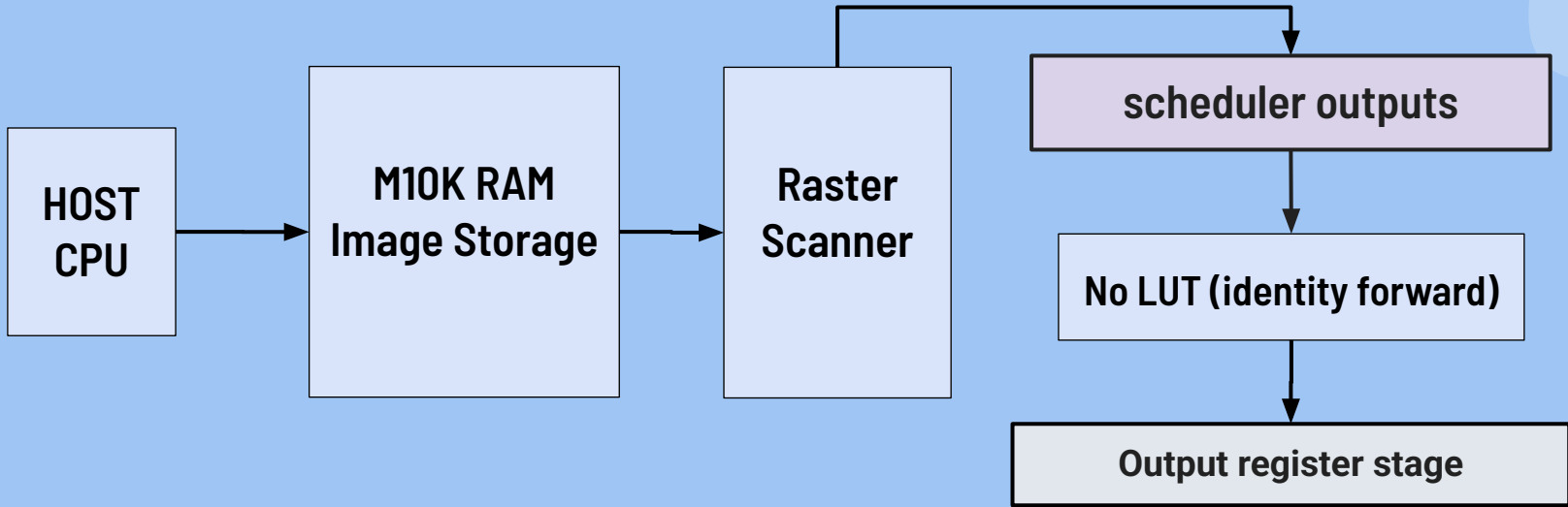
Module - Laplacian



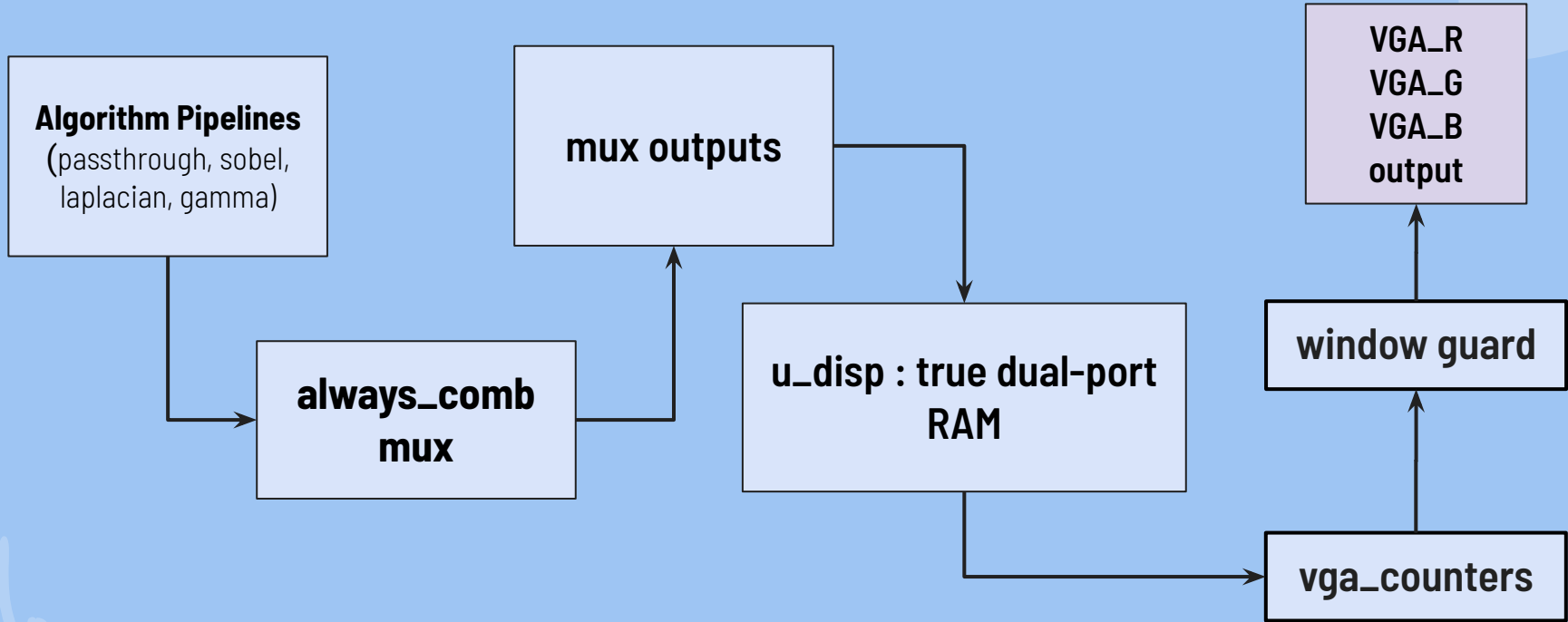
Module - Gamma



Module - "Pass through"



Algorithm Output to VGA signals



Demo