Coded Aperture Pair for Depth from Defocus & Defocus Deblurring

Supplementary Material

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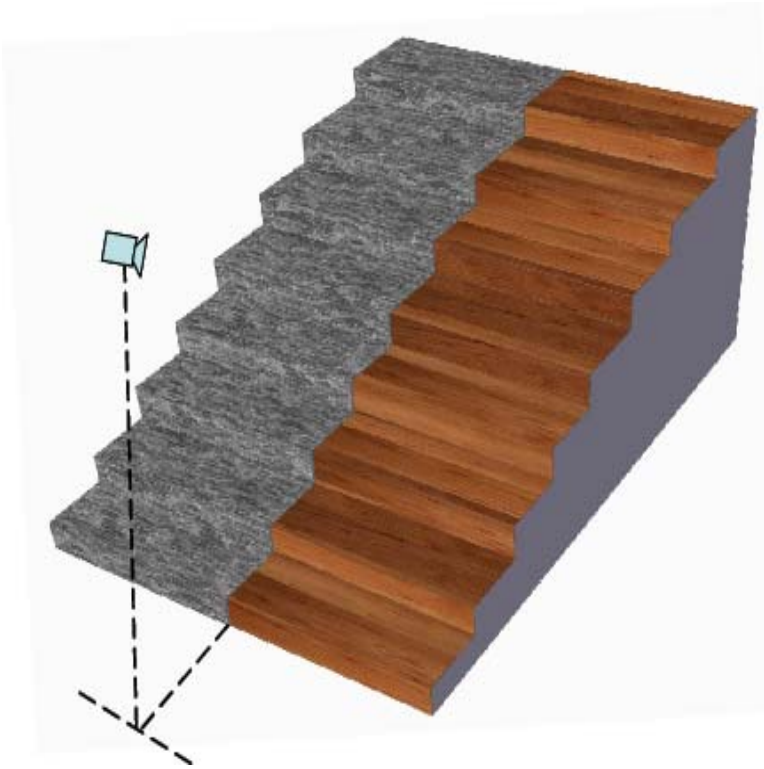
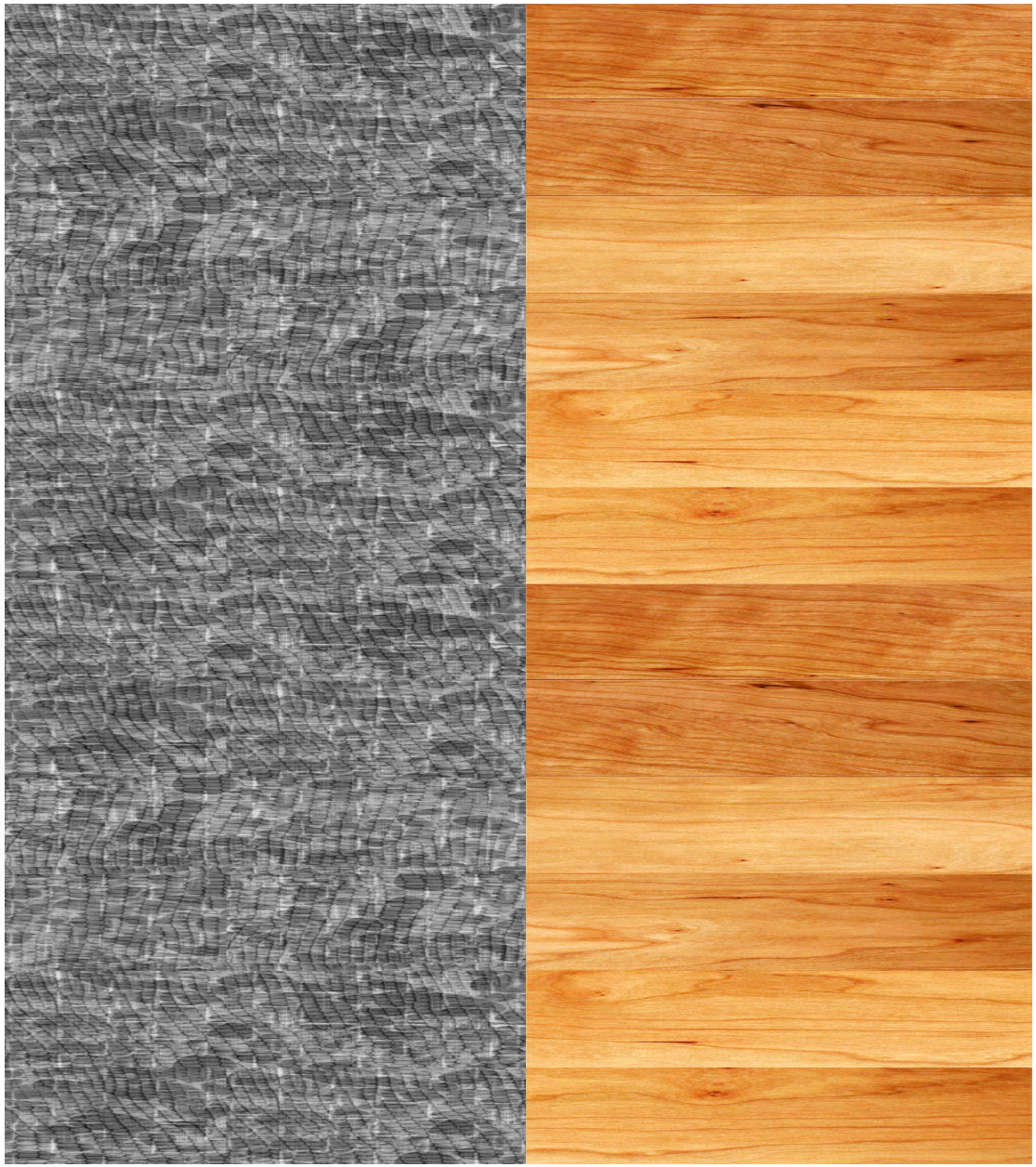
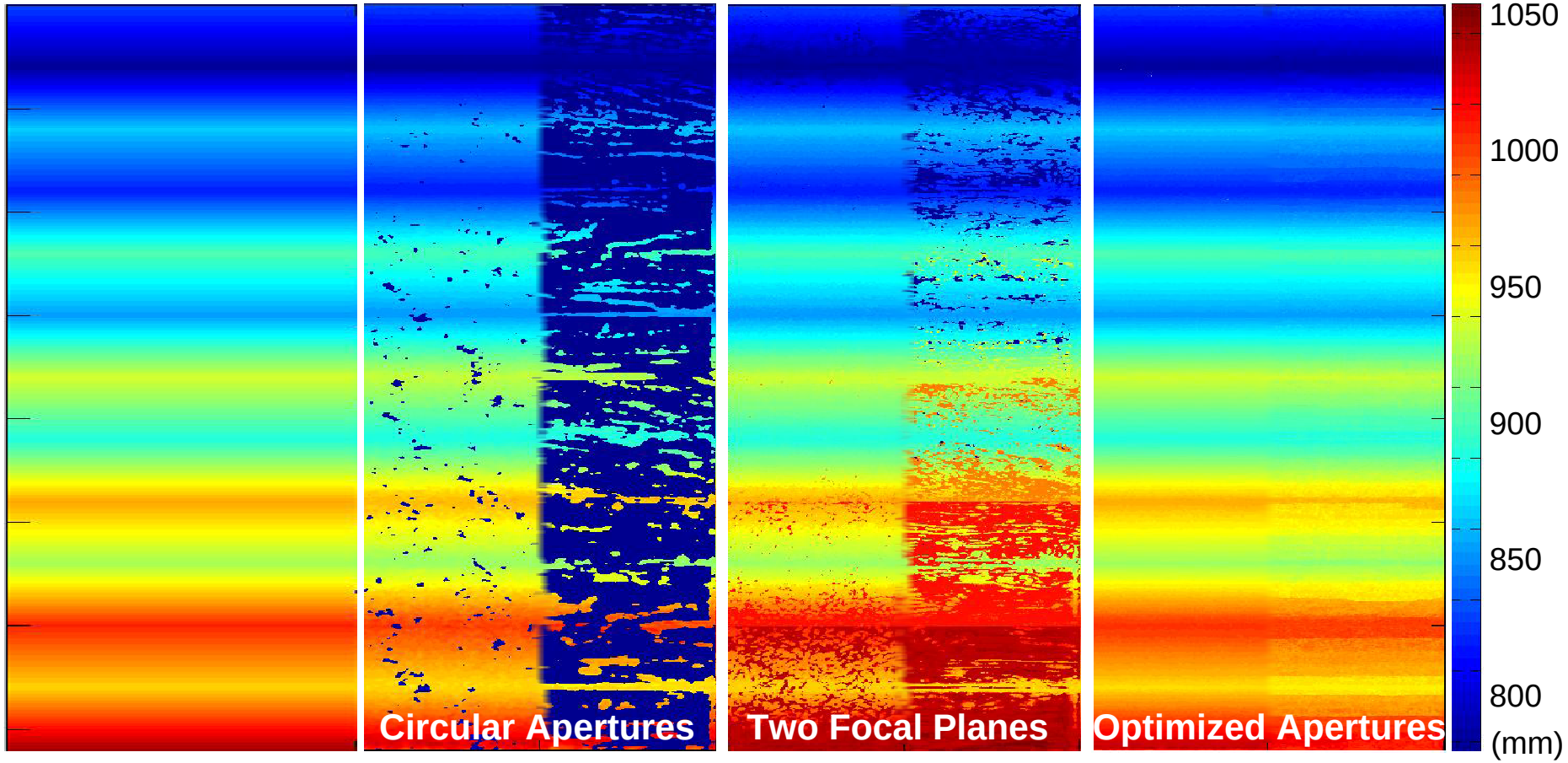
Simulation

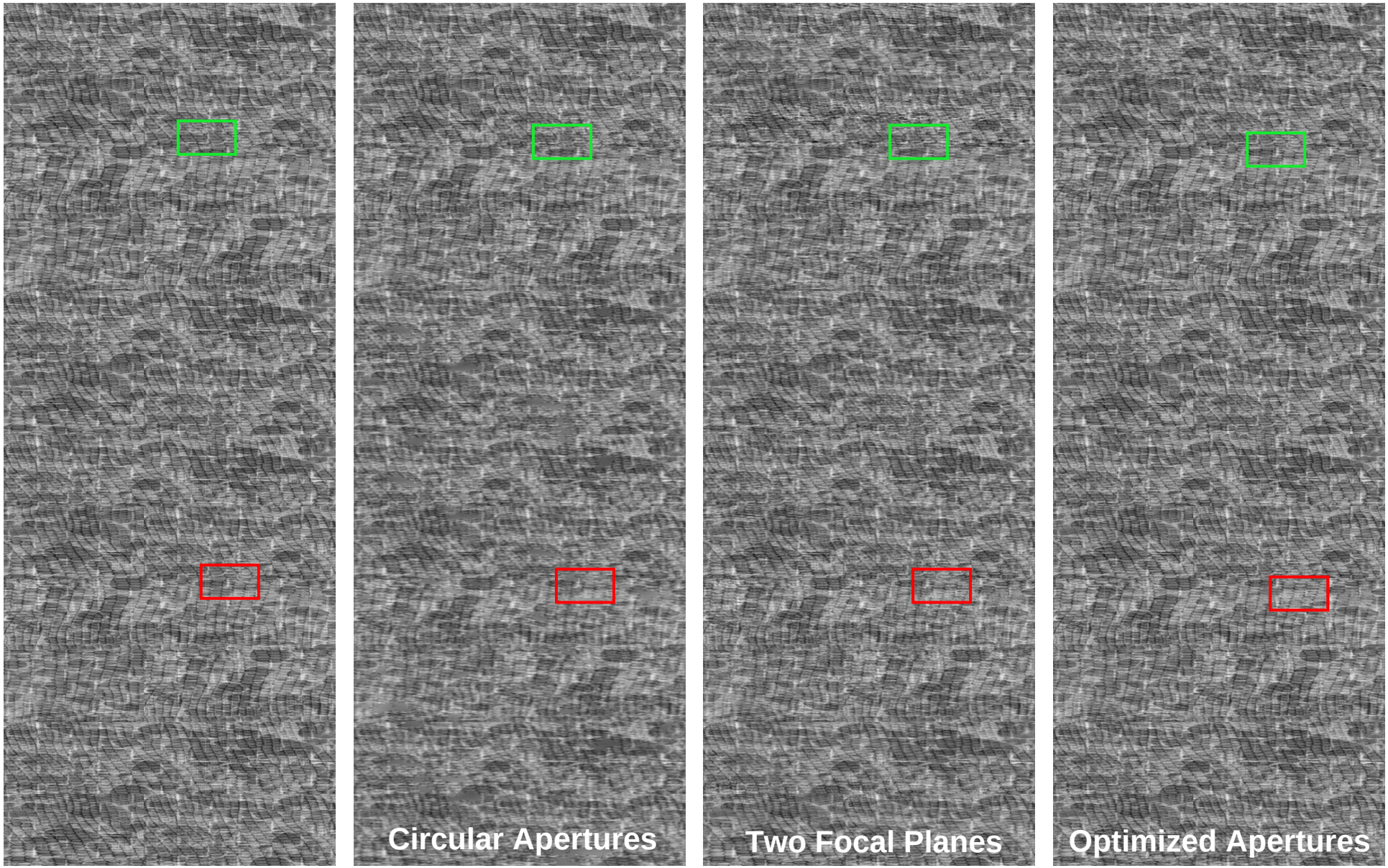


Synthesized Scene



True Texture

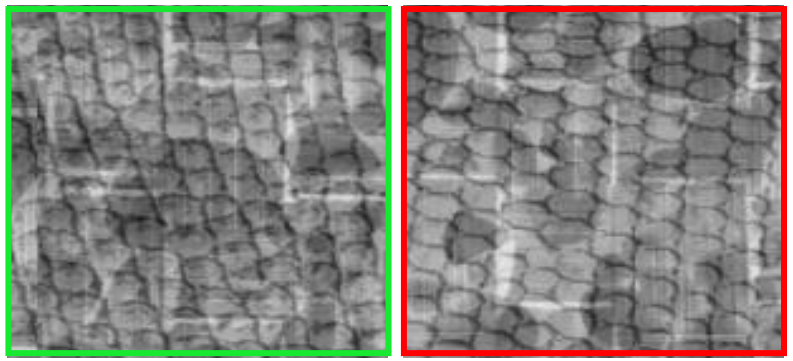

Circular Apertures
Two Focal Planes
Optimized Apertures
1050
1000
950
900
850
800
(mm)
Ground Truth
Estimated Depth Maps



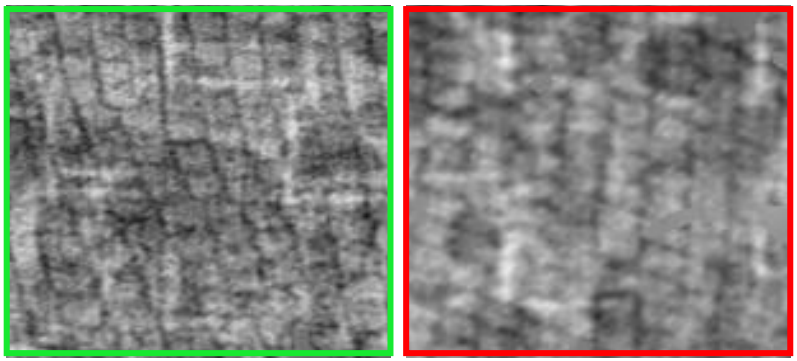
True Texture Recovered All-focused Images (the texture side)

(Zoom in to see details)

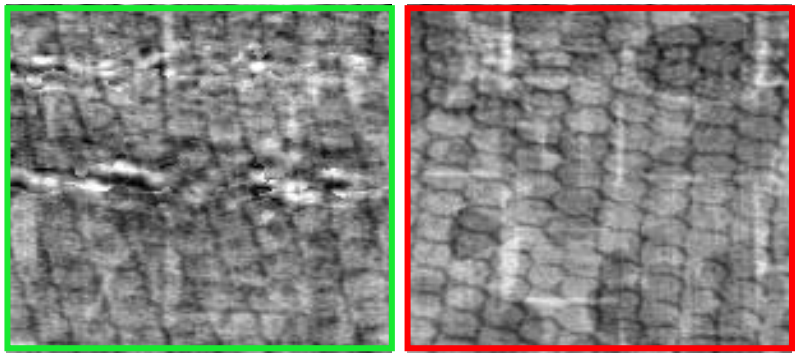
Close-ups of the highlighted regions



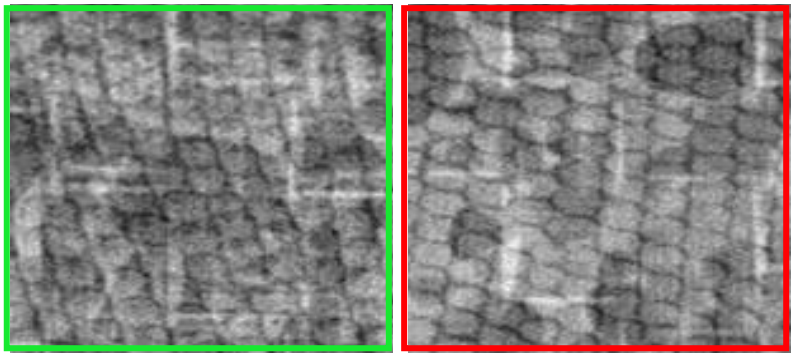
Ground Truth



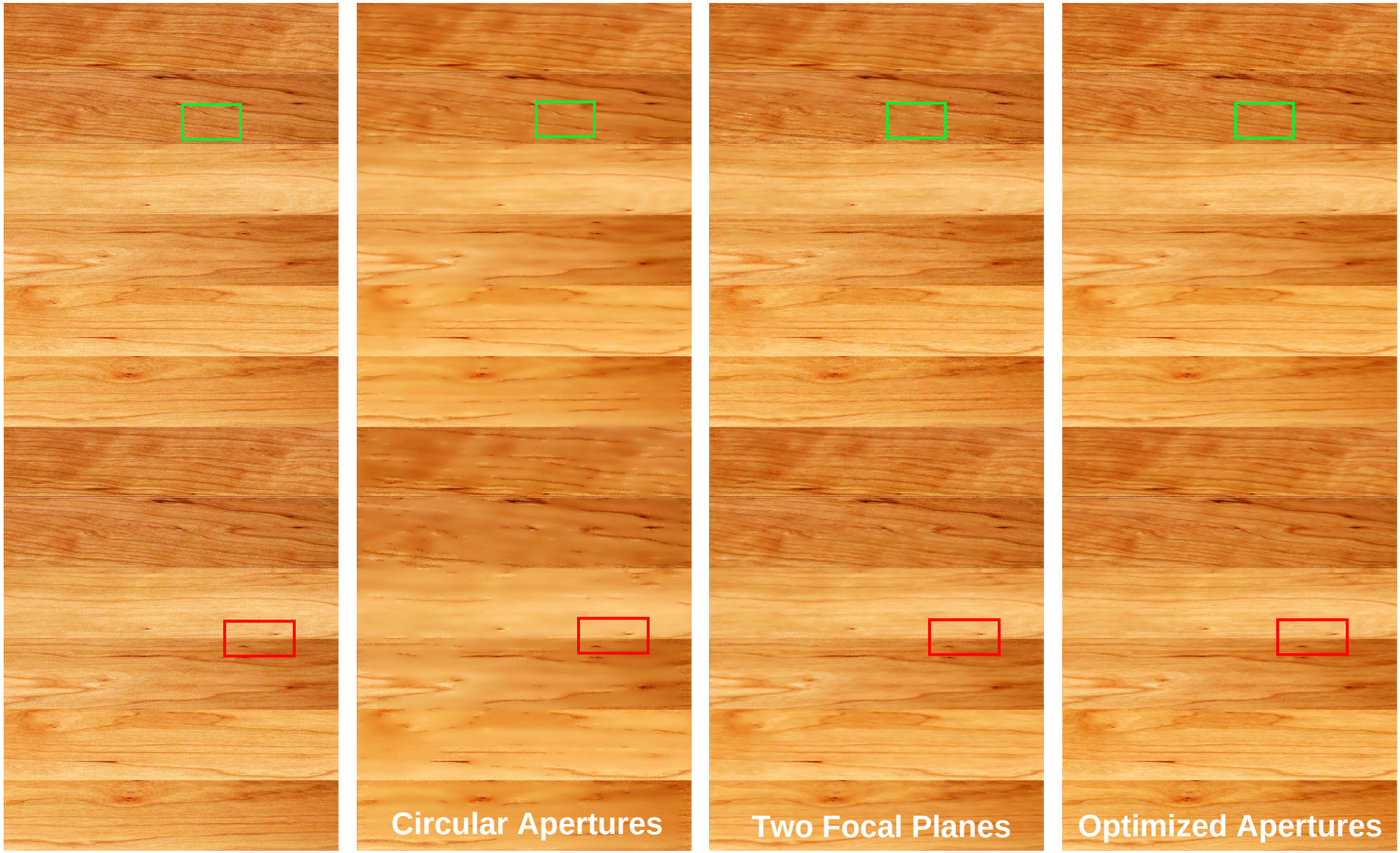
Circular Apertures



Two Focal Planes



Optimized Apertures

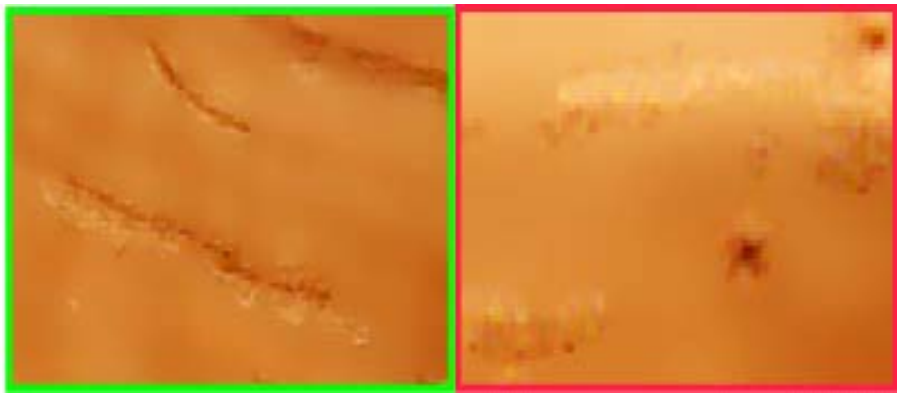


True Texture Recovered All-focused Images (the wood side)

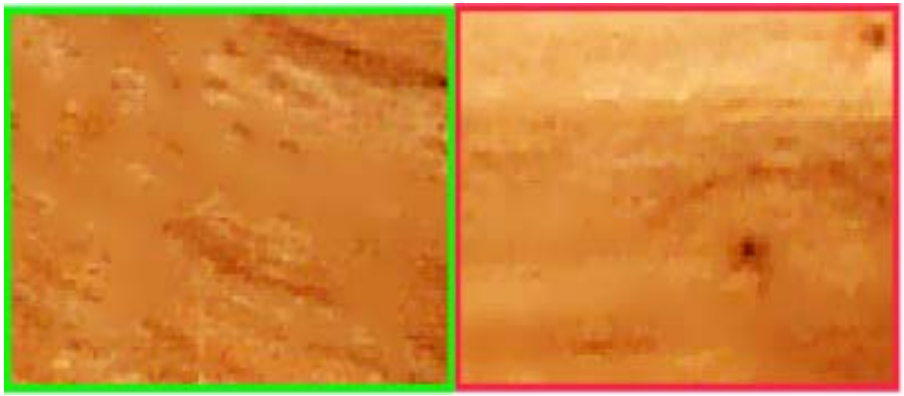
(Zoom in to see details)

Close-ups of the highlighted regions

Ground Truth



Circular Apertures



Two Focal Planes

Optimized Apertures

Experiments

Scene 1

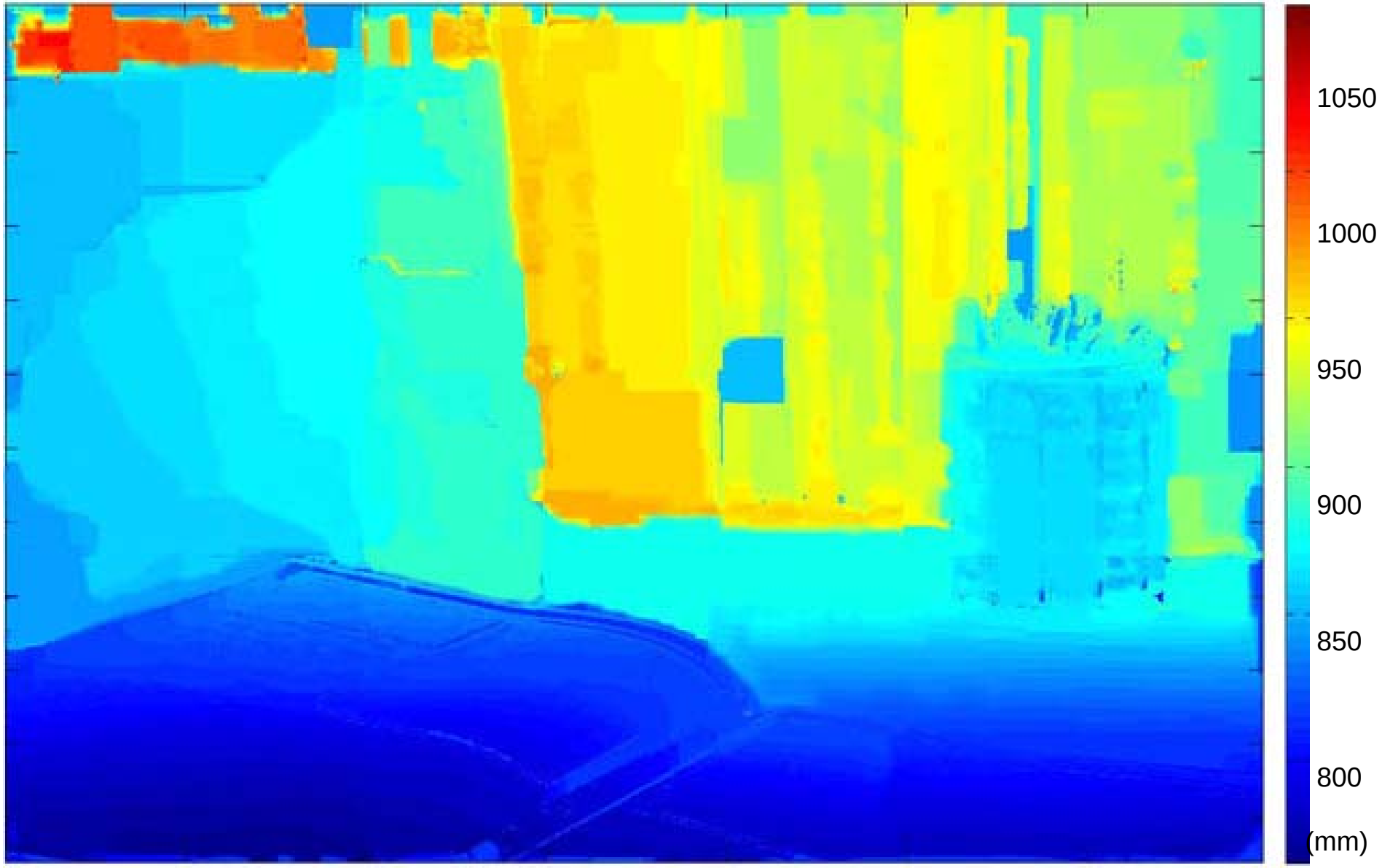
Captured Image 1

(The aperture pattern is shown in the left-top corner)

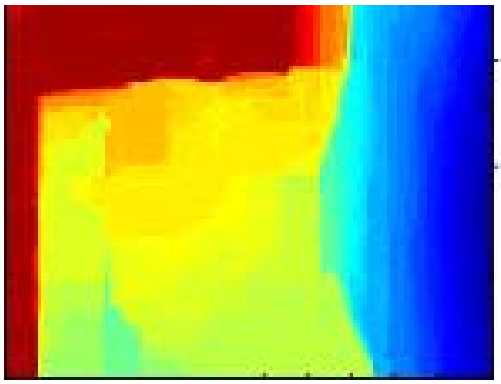
Captured Image 2

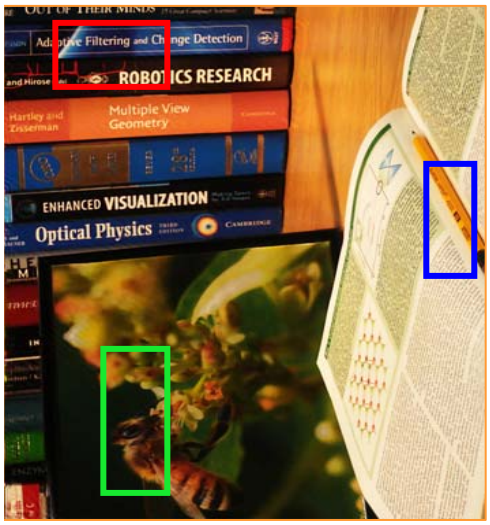
Recovered All-focused Image

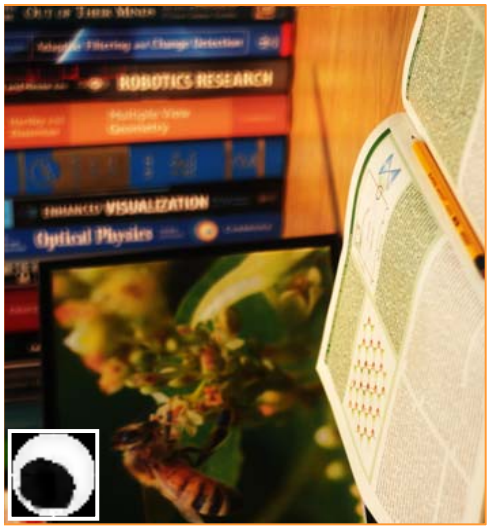
(Zoom in to see more details)

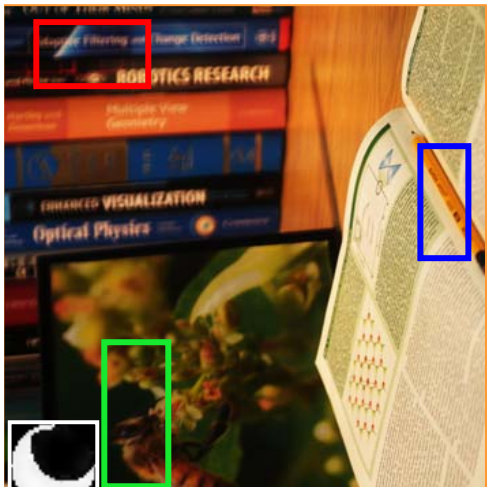


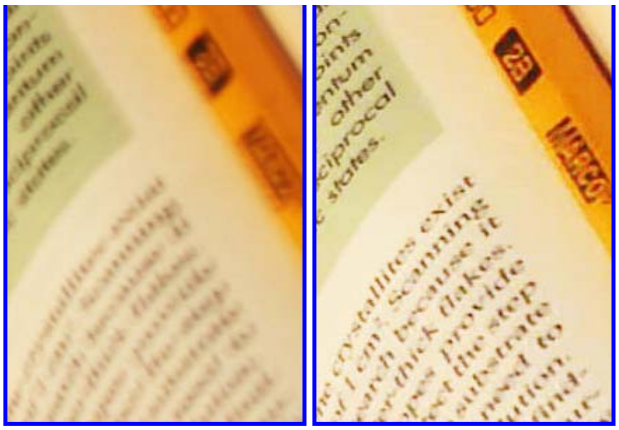
Estimated Depth Map

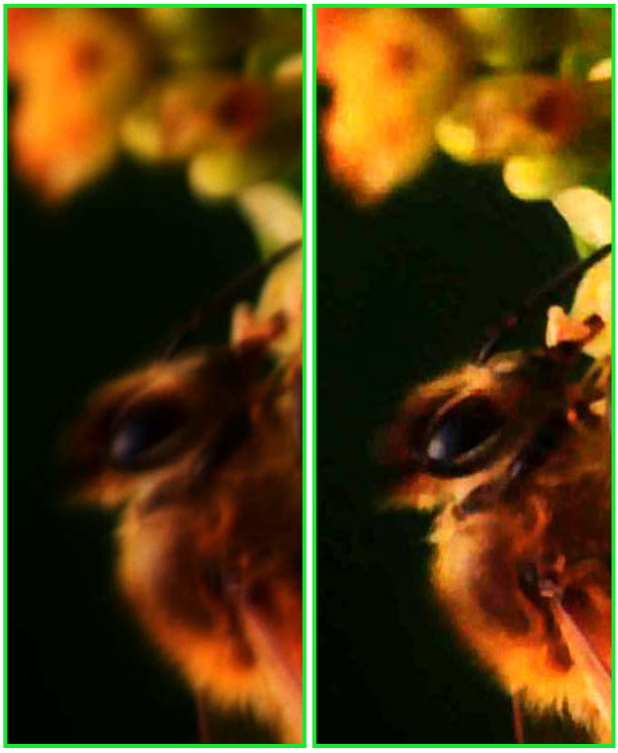



ROBOTICS RESEARCH
Multiple View Geometry
ENHANCED VISUALIZATION
Optical Physics


ROBOTICS RESEARCH
Optical Physics


Optical Physics





ROBO

ROBO

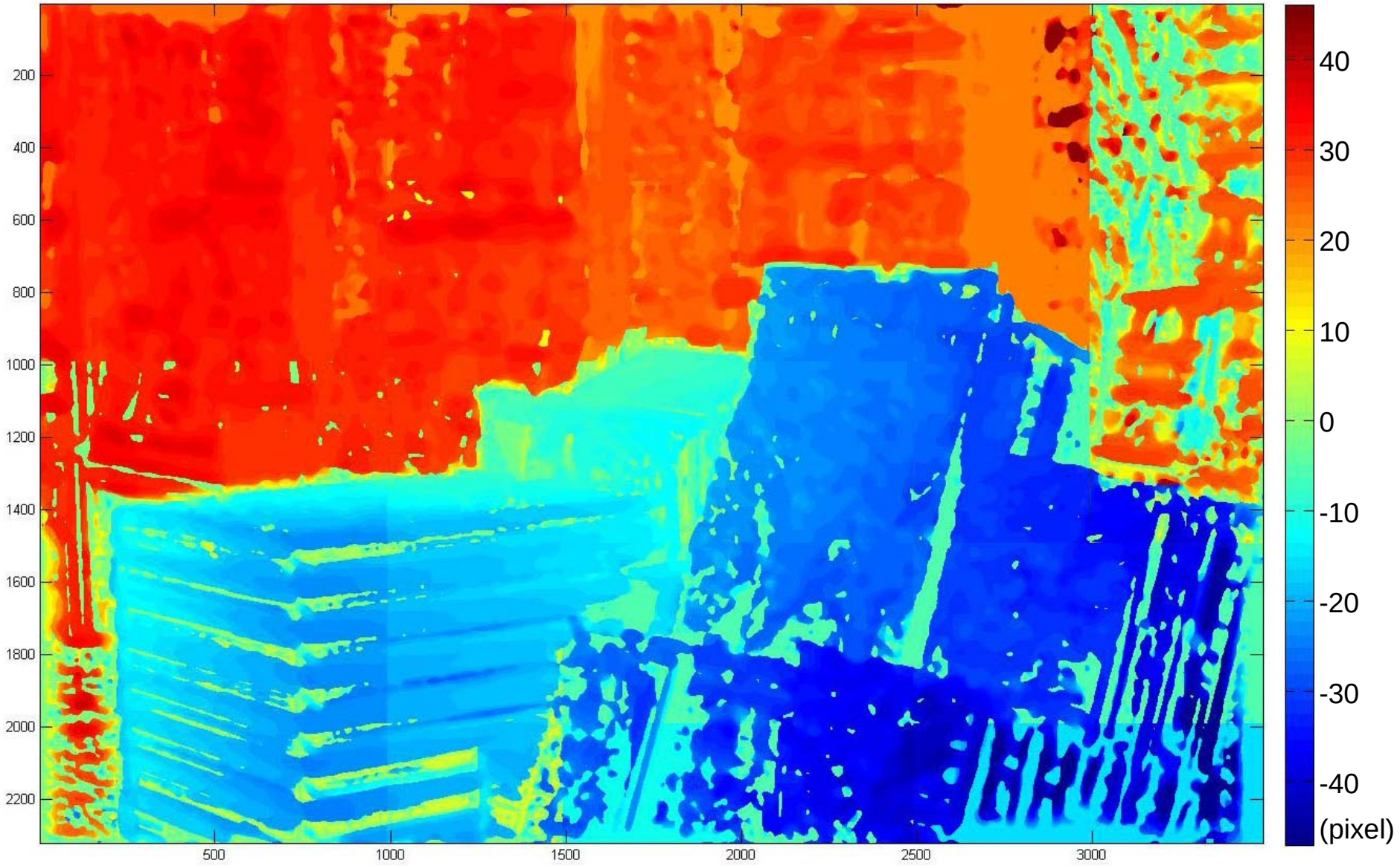
Scene 2

Captured Image 1

Captured Image 2

Recovered All-focused Image

(Zoom in to see more details)



Estimated Depth Map

Ground truth image taken with f/16
(The view point is slightly shifted)

Scene 3

Captured Image 1

(using a large circular aperture)

Captured Image 2

(using a small circular aperture)

Recovered All-focused Image

(using the conventional small/large circular aperture pair)

Captured Image 1

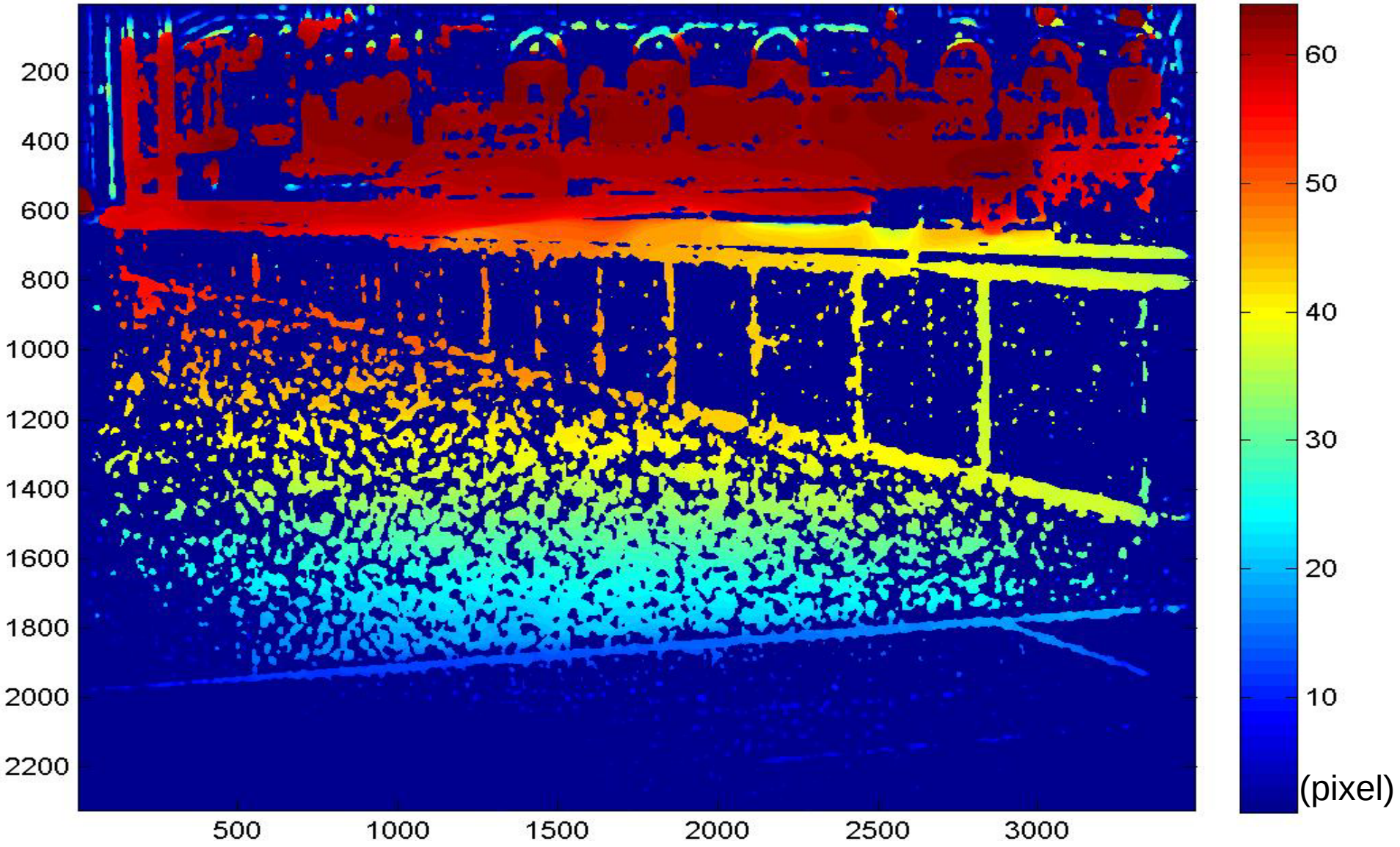
(using the optimized coded aperture 1)

Captured Image 2

(using the optimized coded aperture 2)

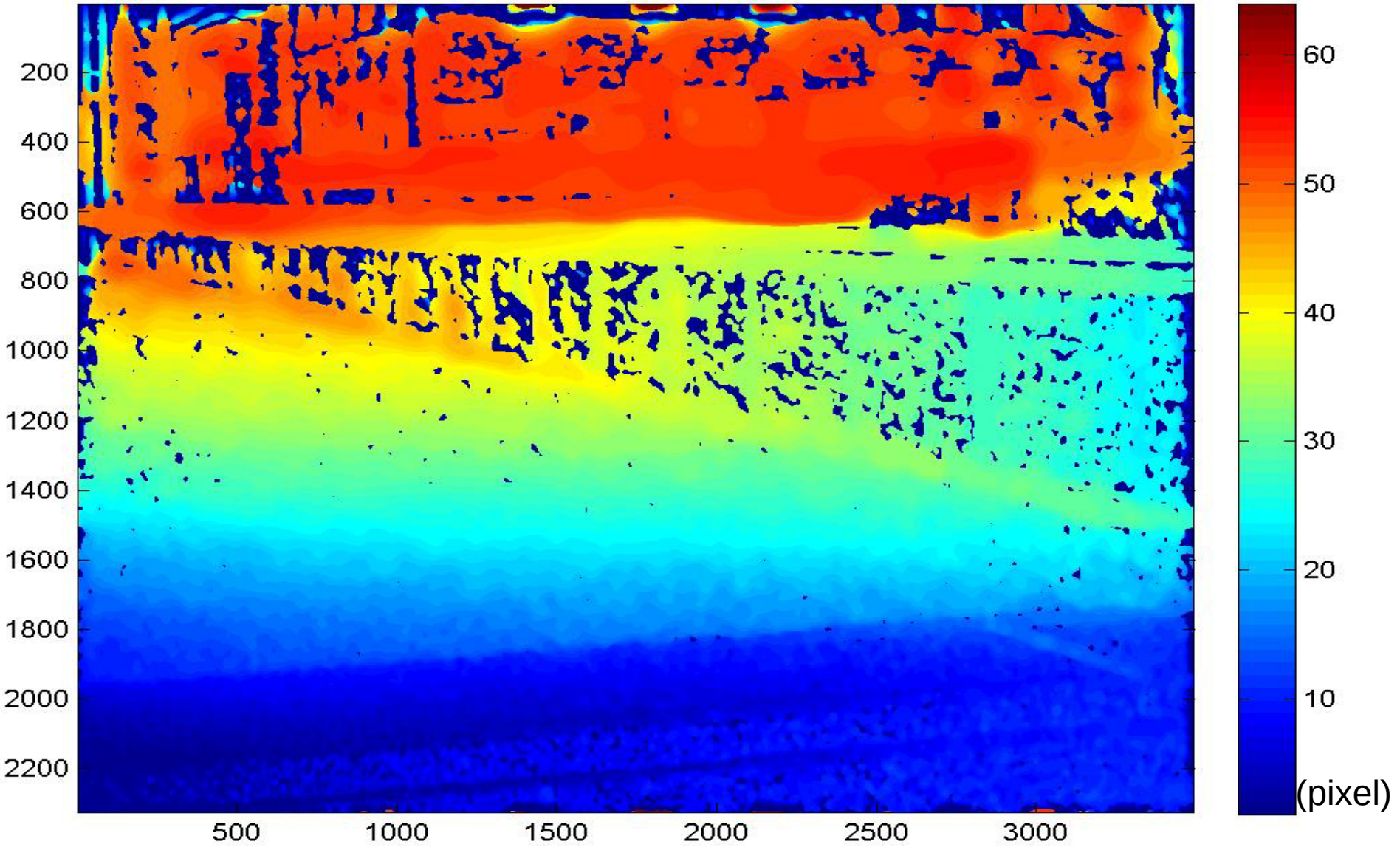
Recovered All-focused Image

(using the optimized coded aperture pair)



Estimated Depth Map

(using the conventional small/large circular aperture pair)



Estimated Depth Map

(using the optimized coded aperture pair)

Scene 4

Captured Image 1

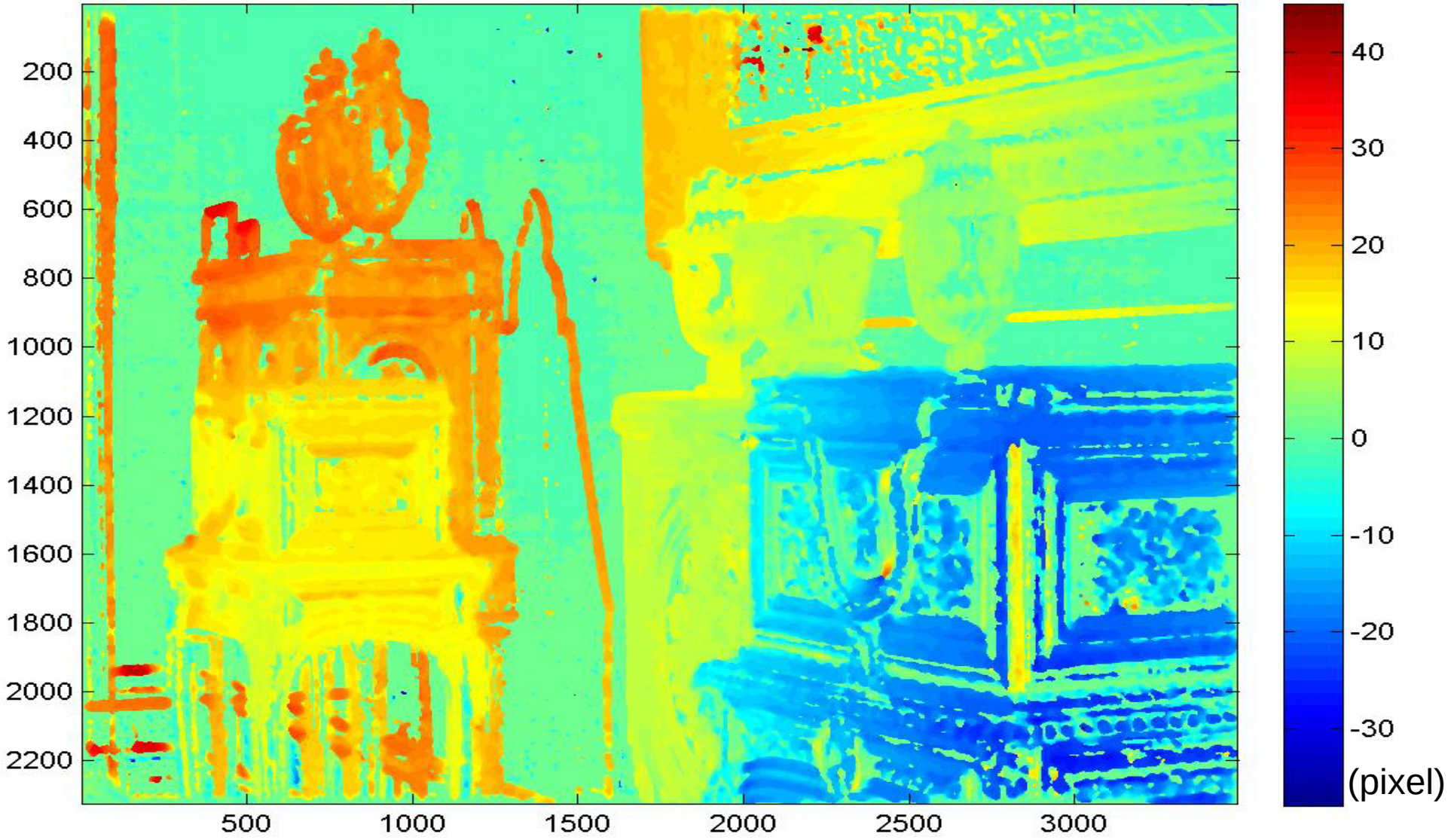
(using the optimized coded aperture 1)

Captured Image 2

(using the optimized coded aperture 2)

Recovered All-focused Image

(using the optimized coded aperture pair)



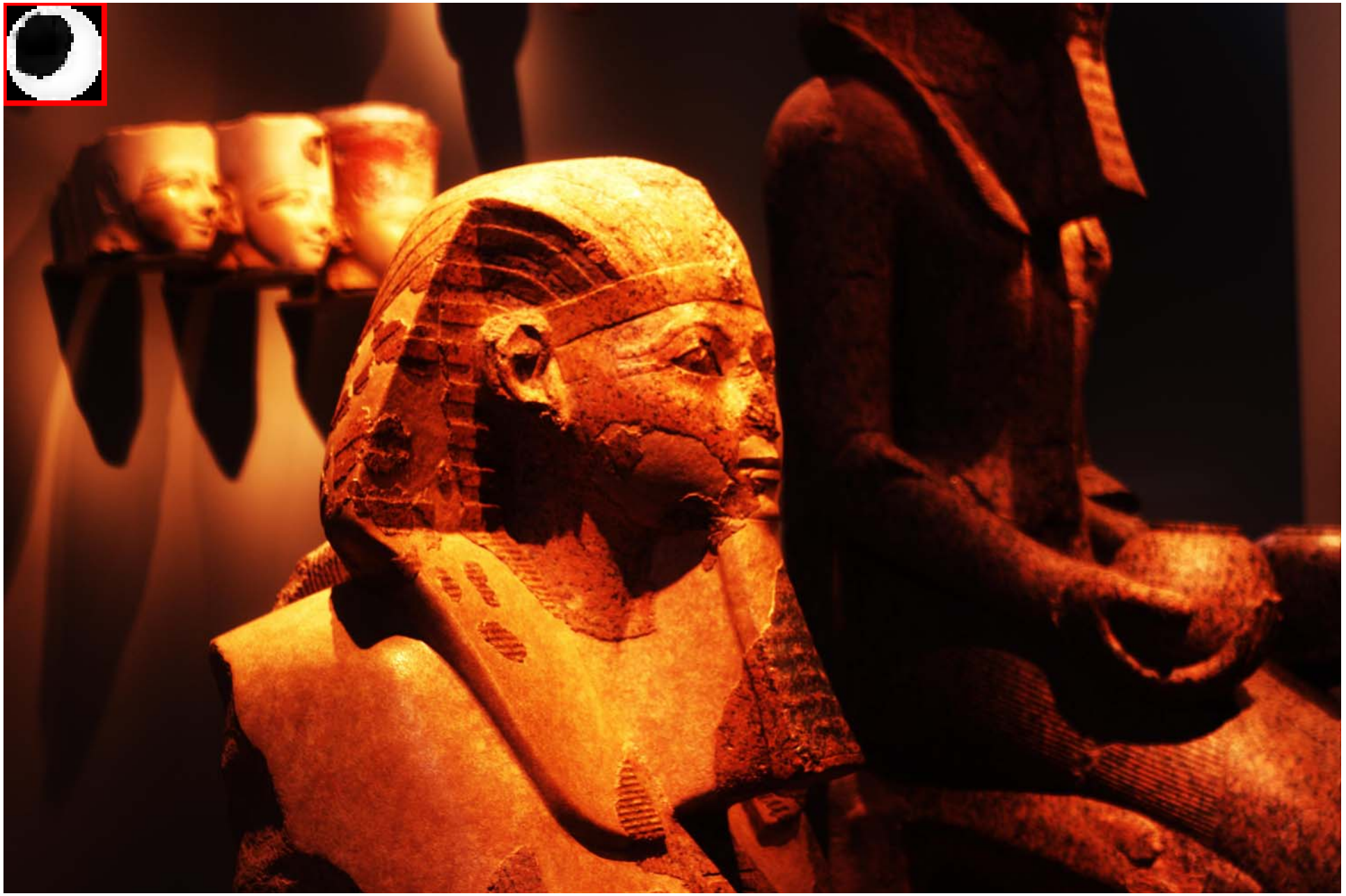
Estimated Depth Map

(using the optimized coded aperture pair)

(The blur size of a surface without any texture will be estimated as 0)

Scene 5

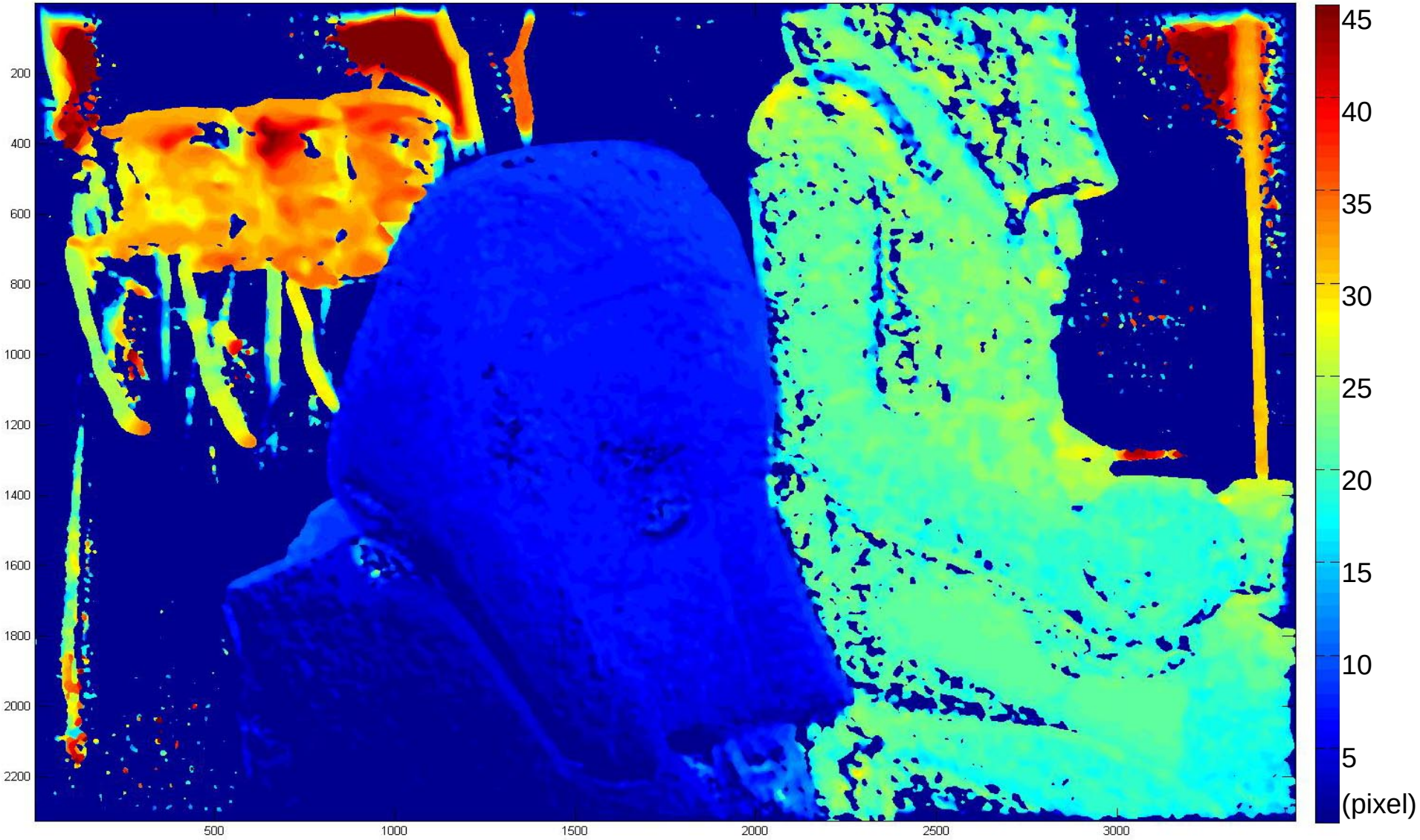
Captured Image 1
(using the optimized coded aperture 1)



Captured Image 2
(using the optimized coded aperture 2)

Recovered All-focused Image

(using the optimized coded aperture pair)



Estimated Depth Map

(using the optimized coded aperture pair)

(The blur size of a surface without any texture will be estimated as 0)