



One Shot High Dynamic Range Photography Based on Hardware-level Tunable Mask

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Motivation

We proposed to apply a coded mask served as a filter before CMOS. The transmission of the mask should be able to be tuned pixel by pixel. Such method enables us to achieve HDR with ONE shot.



Over exposed



HDR image

Related Work

HDR often requires multiple shots to synthesize a high dynamic range image. The shortcoming is the current HDR technic are time consuming.



Multiple image



Synthesized HDR image

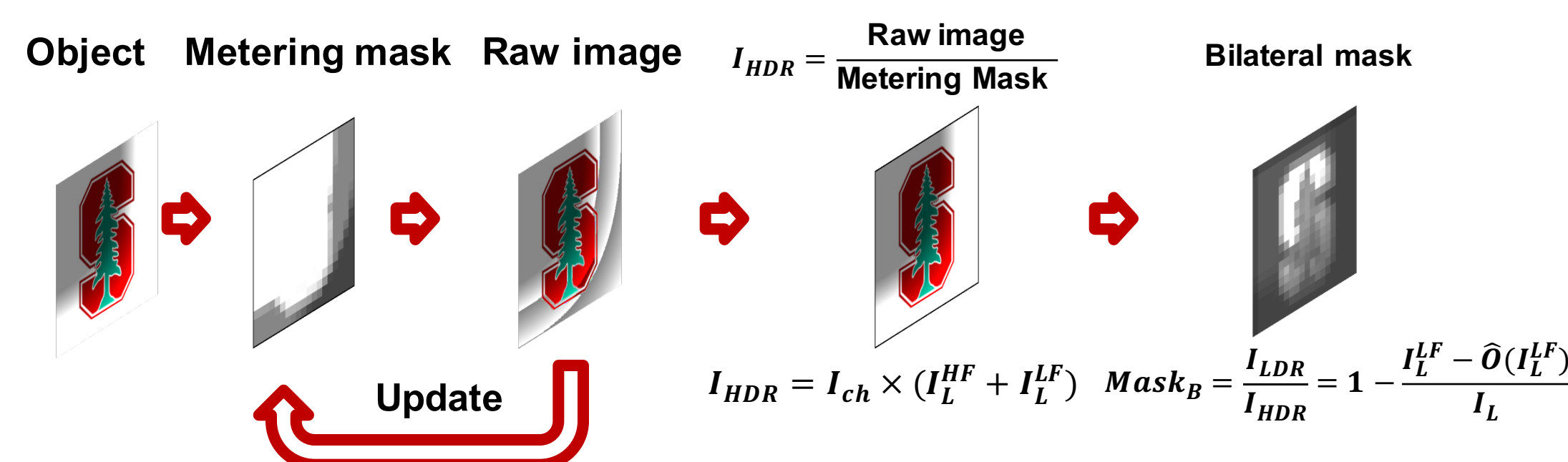
Work summary

	Create mask	
Show mask	Iterative generating	Real time generating
Binary mask	N/A	HDR Video
Grayscale (Coded shutter)	Bilateral mask HDR Image	HDR Image

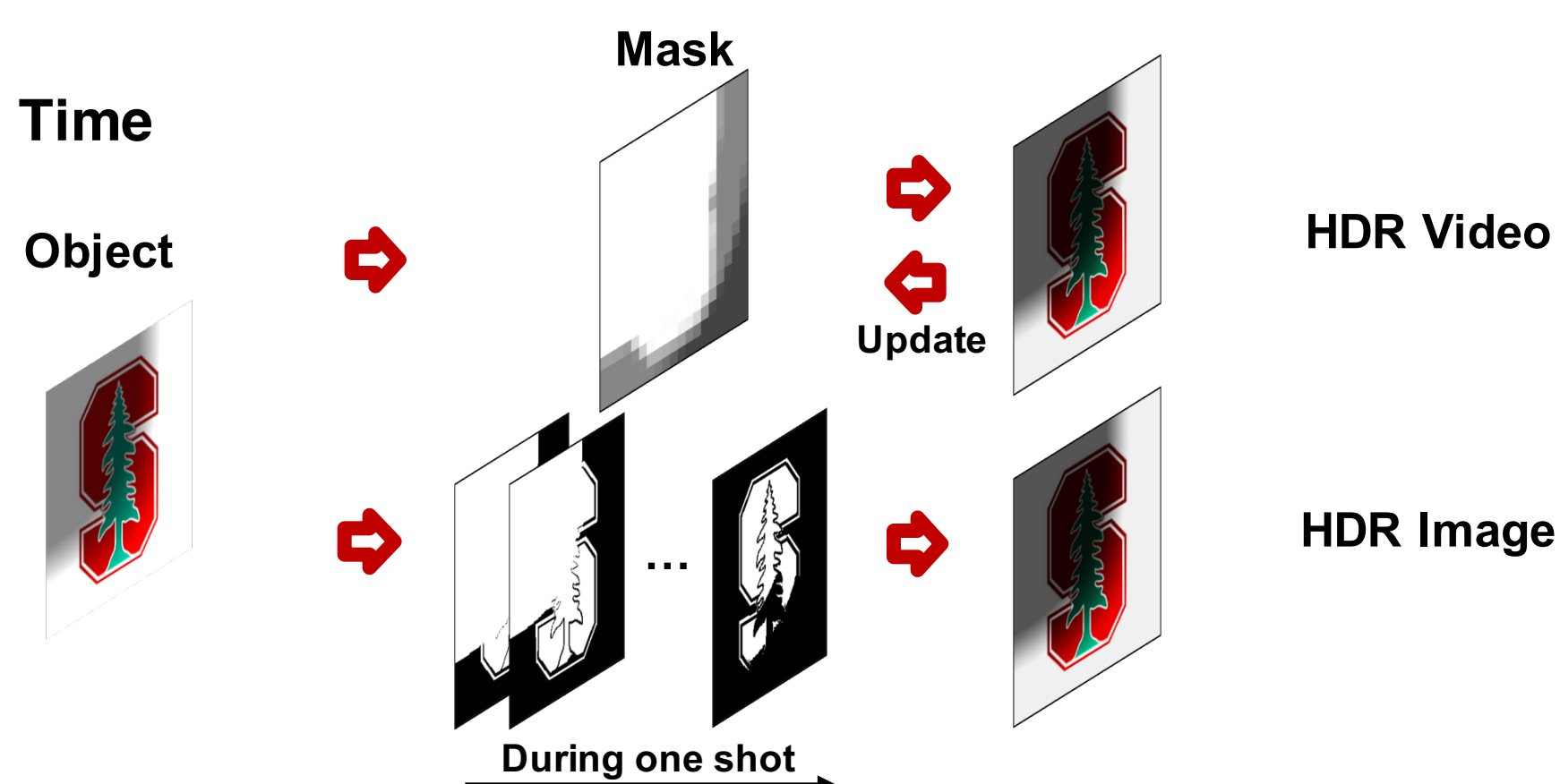
Algorithm

Step 1. Create Mask

a. Iterative Generating + Bilateral

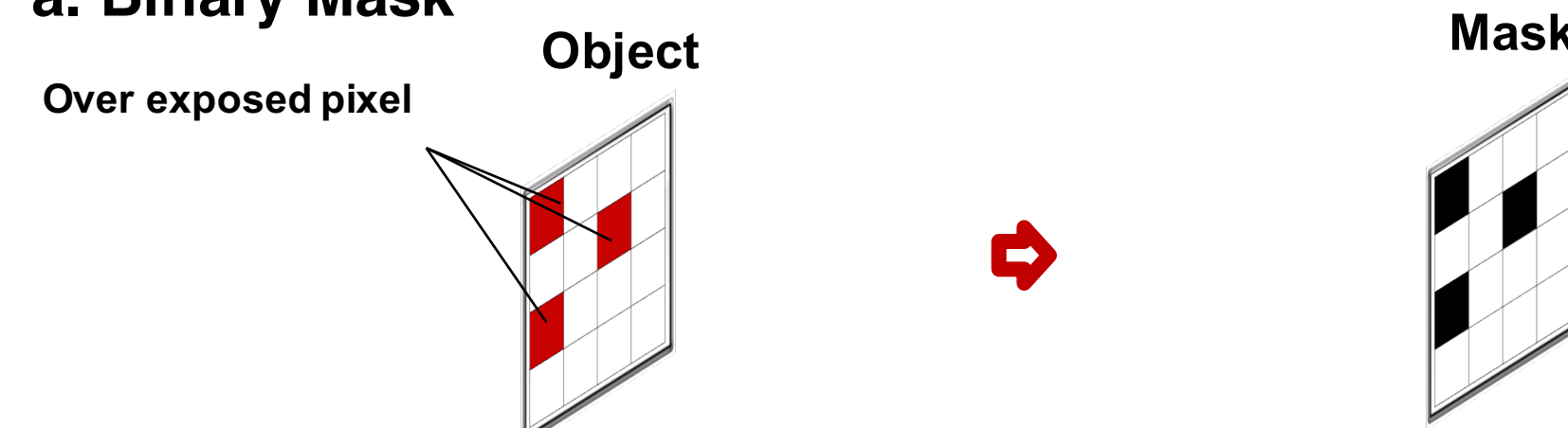


b. Real Time

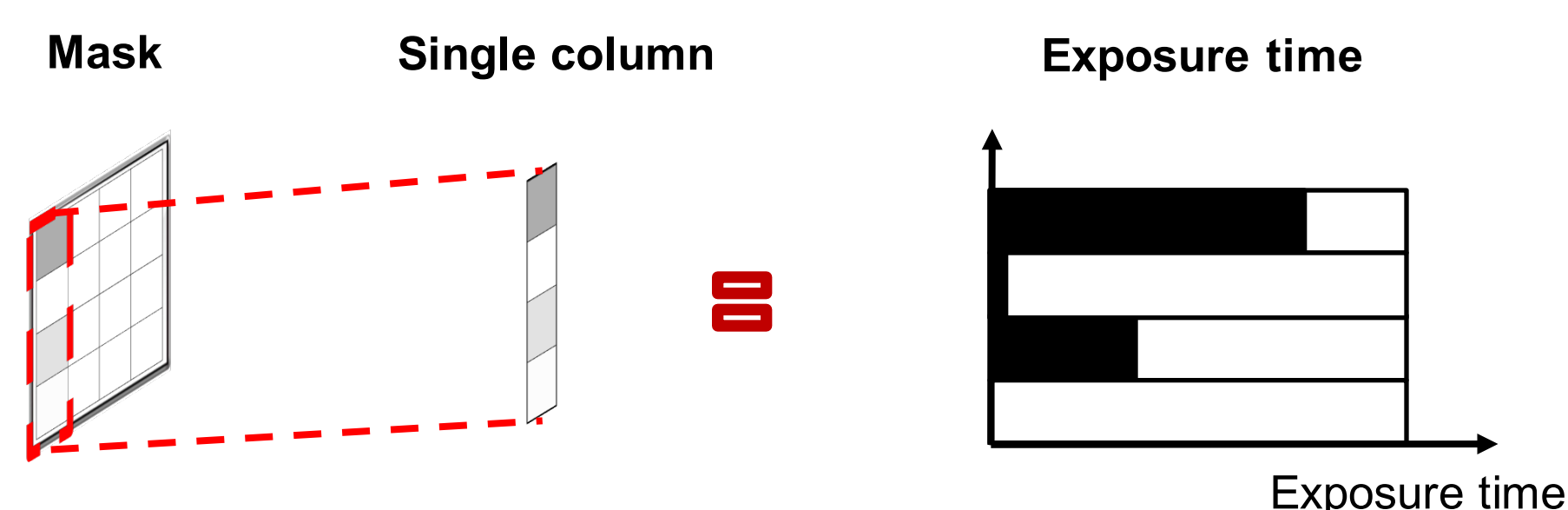


Step 2. Show Mask

a. Binary Mask

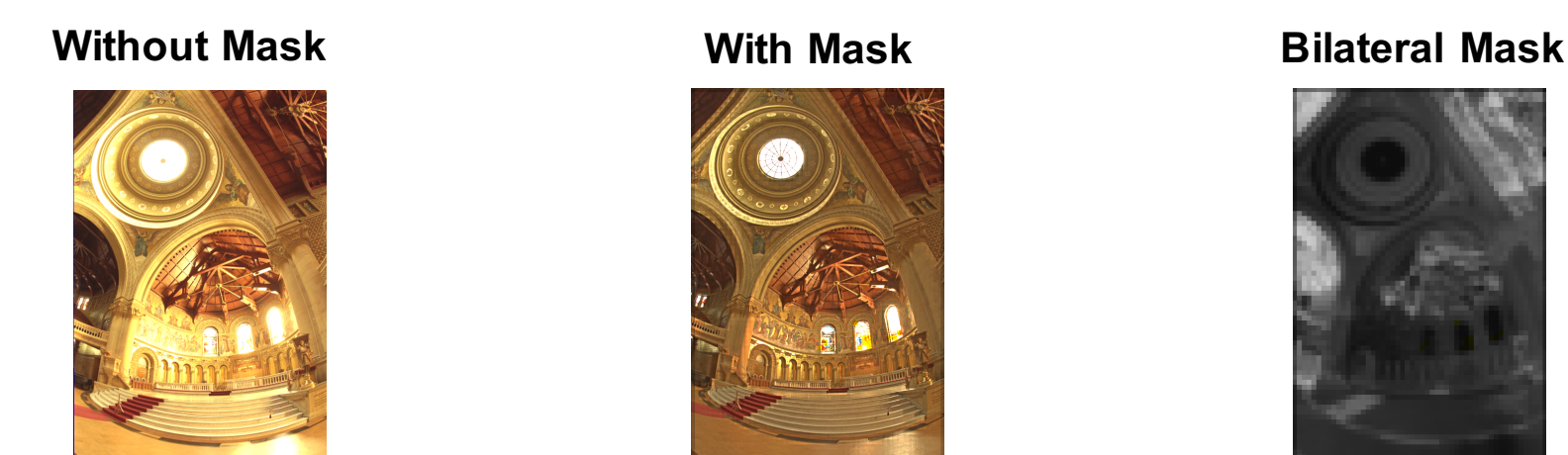


b. Gray Scale achieved by Coded Shutter

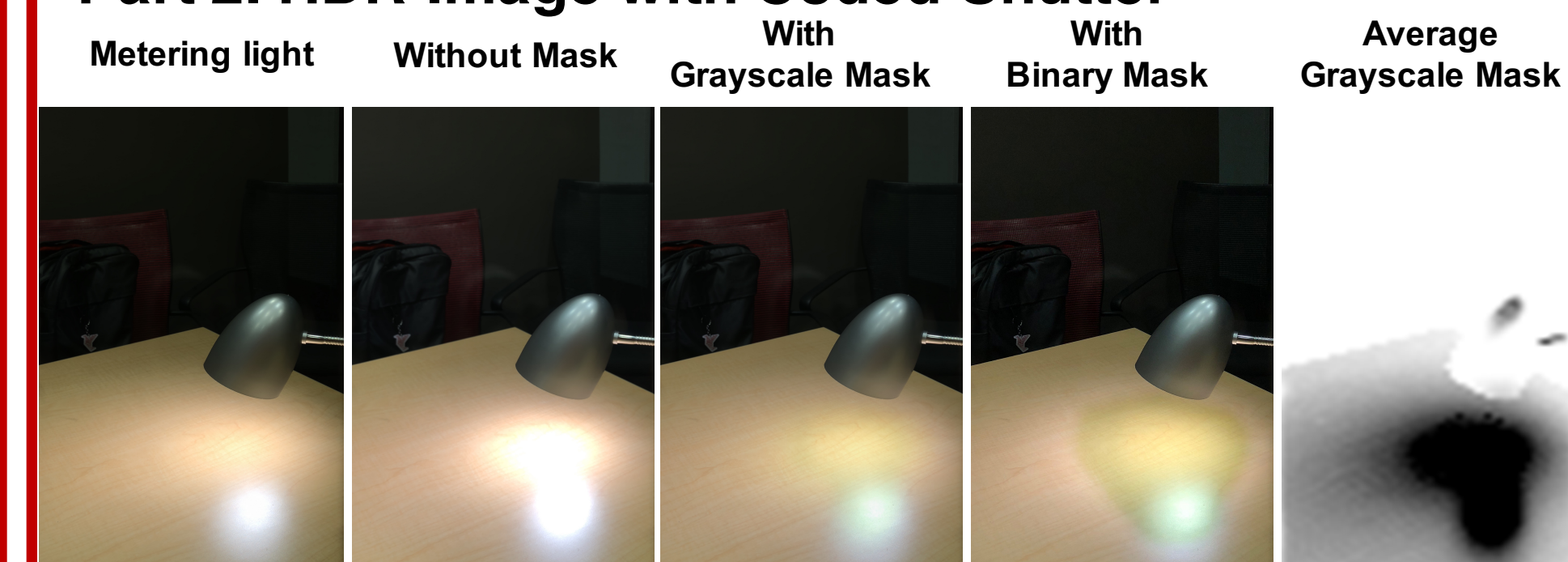


Results

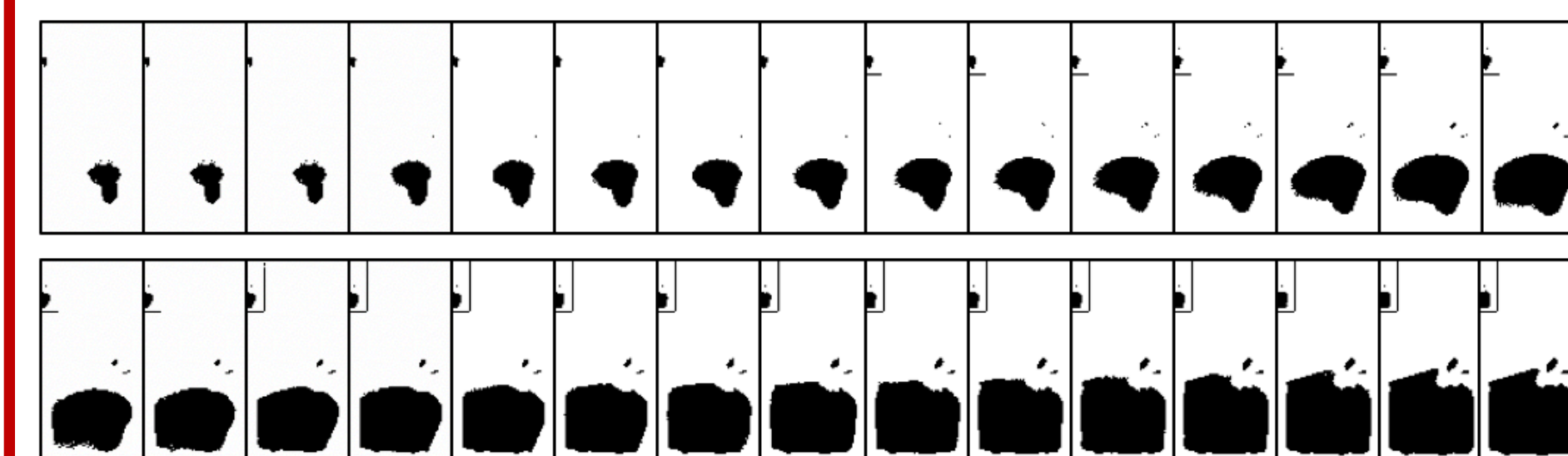
Part 1. Bilateral Mask HDR Image



Part 2. HDR Image with Coded Shutter



Grayscale Mask through Exposure Time



Part 3. HDR Video

