

PV227 GPU Rendering

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- tone mapping,
- bloom.



Dynamic Range

- dynamic range – ratio between the largest and smallest possible values of a changeable quantity,
- in our case the range of luminances (of a sensor, of the human eye, of an output device, ...)
- not the same for all of these!



High Dynamic Range Imaging

- techniques used to reproduce higher dynamic range than normally possible.



Figure: Taken from en.wikipedia.org. Acquisition example, multiple images taken at different exposition (measured in stops).

High Dynamic Range Imaging (cont.)



Simple contrast reduction



Local tone mapping

Figure: Taken from en.wikipedia.org. Acquisition example, the composed image.

Tone Mapping

- mapping one set of colors to another to approximate the appearance of high dynamic range images in a medium that has a more limited dynamic range.

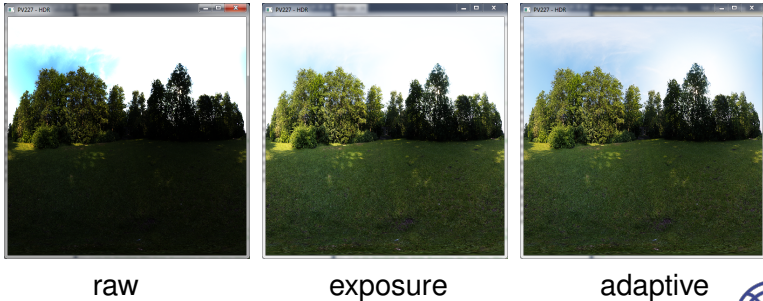


Figure: Three tone mapping approaches.

Exposure Mapping

- compute image taken at a particular “exposure” from an HDR image,
- $rgb = 1 - 2^{-hdr * exposure}$.



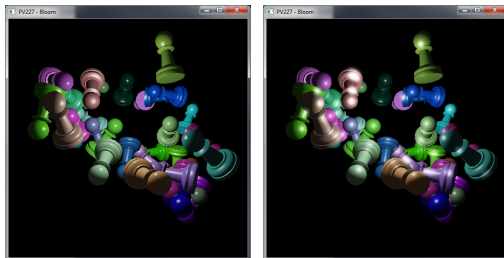
Adaptive (Local) Tone Mapping

- exposure chosen automatically based on image properties,
 - according to the luminance of neighbouring pixels,
 - higher exposure in dark regions, low exposure in bright regions.



Bloom (Glow)

- artifact of a sensor (camera, eye) overwhelmed by bright light,
- artificially added in computer graphics.



Off

On

Figure: Bloom effect.

Bloom (cont.)

- separate high luminance pixels (highlights),
- blur the highlights to extend them beyond their natural borders,
- compose the two images back together.

