

Shadows

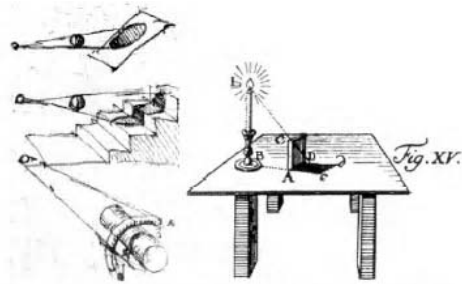
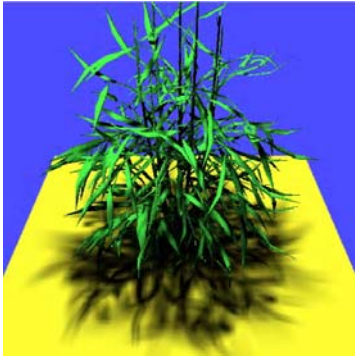


Figure 1: Left: Study of shadows by Leonardo da Vinci⁴⁷ – Right: Shadow construction by Lamber⁵⁵.

[A survey of Real-Time Soft Shadows Algorithms
Hasenratz, Lapierre, Holzschuch, Sillion; Eurographics STAR Report, 2003] Michiel van de Panne

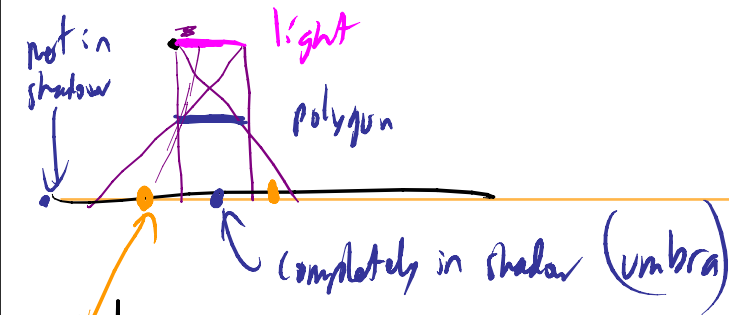


Figure 7: Hard vs. soft shadows

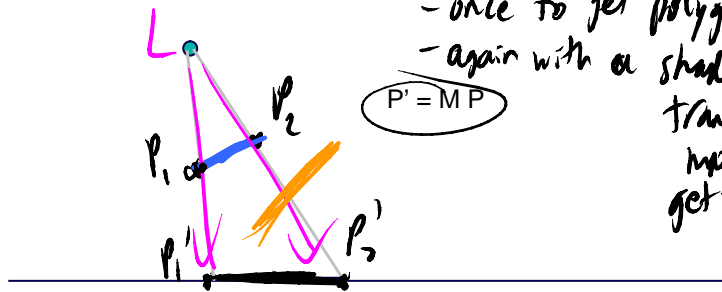
For completely static scenes, we can precompute shadows and render them using textures.

A survey of Real-Time Soft Shadows Algorithms
<http://w3imagis.imag.fr/Publications/2003/HLHS03/index.fr.html>

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Real-Time Shadows

Projective Shadows

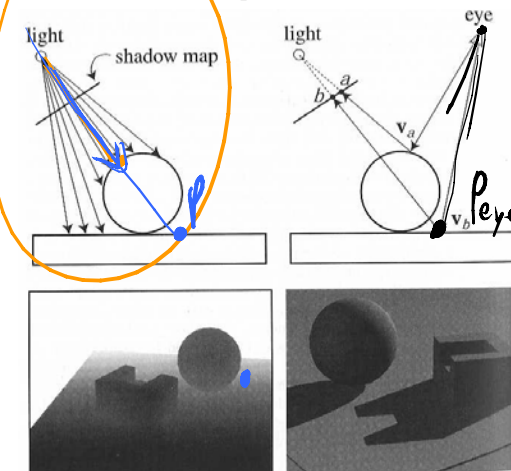


- draw polygon twice
 - once to get polygon on screen
 - again with a shadow transformation matrix to get the shadow
- $P' = M P$

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Real-Time Shadows

Shadow Maps



[Akenine-Moller and Haines, "Real-Time Rendering"]

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Real-Time Shadows

Shadow Volumes

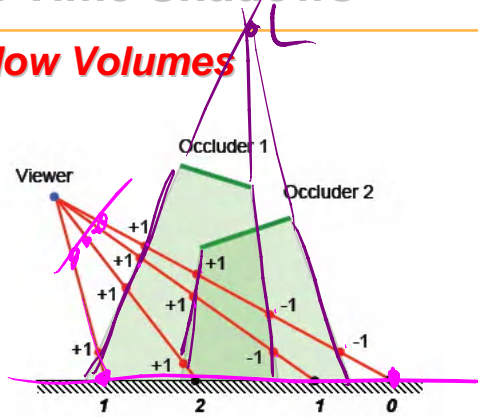


Figure 12: *Shadow volume.*