

Surface Light Fields

October 07, 2004

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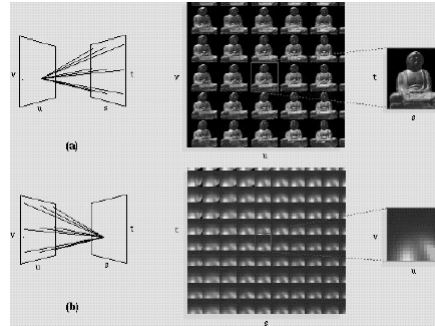
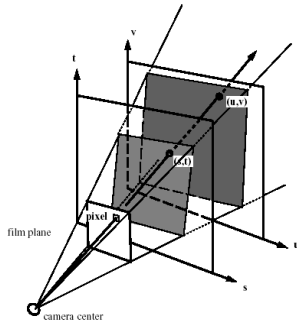
Announcement

- Assignment 1.
- Volunteers wanted for early paper presentations.

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Images as 4D Samples

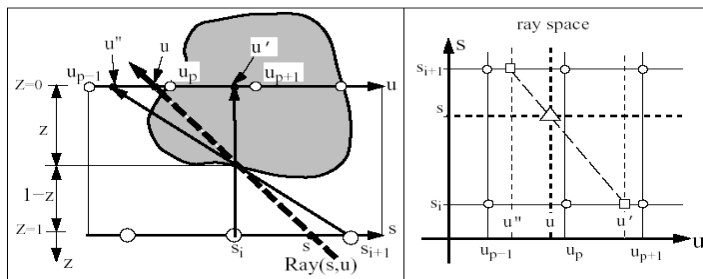
- Consider each image pixel a sample of 4D Light Field.



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Lumigraph

- Lumigraph uses “rough” 3D geometry to improve the rendering quality:



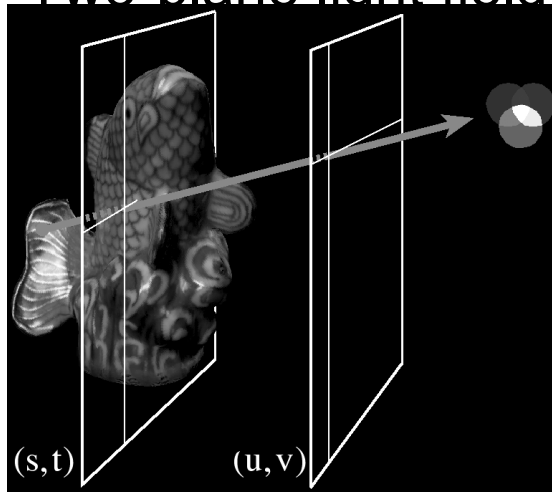
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Two-plane light field

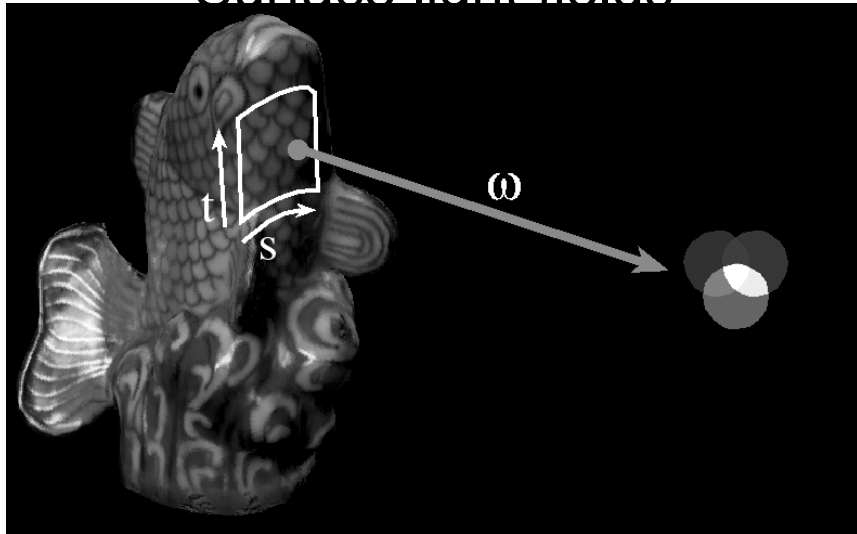


Levoy and Hanrahan 1996

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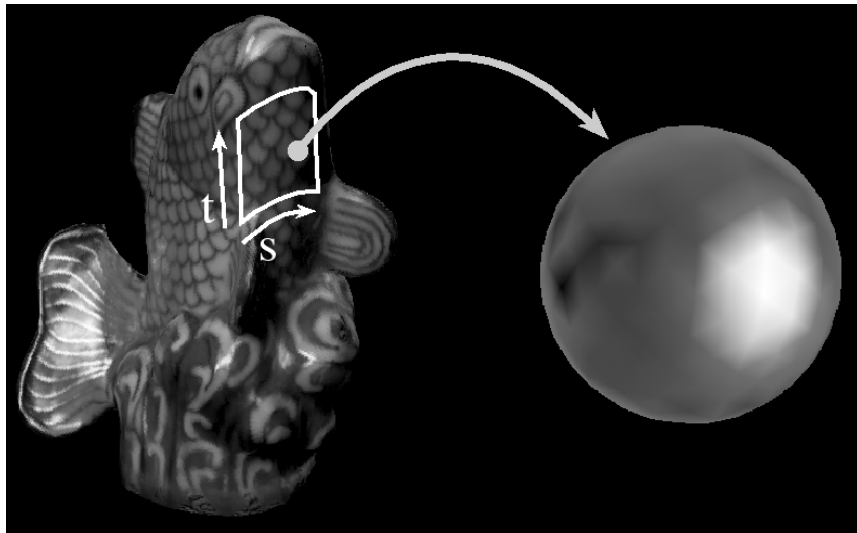
Porter et al. 1996

Surface light fields



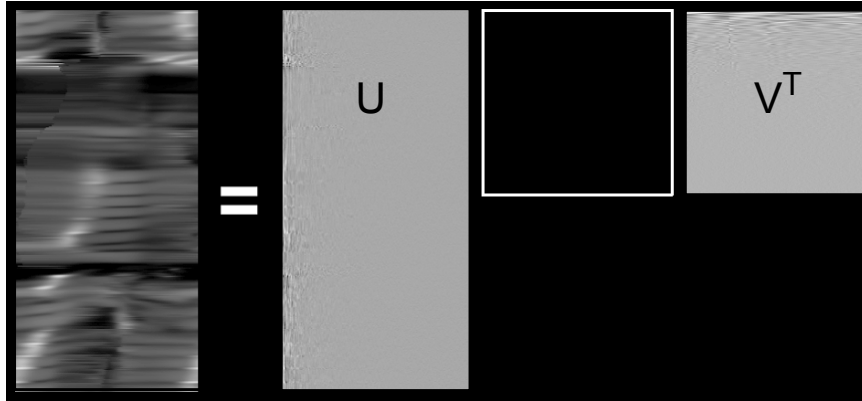
Nishino *et al.* 1999
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Lumisphere-valued "texture" maps



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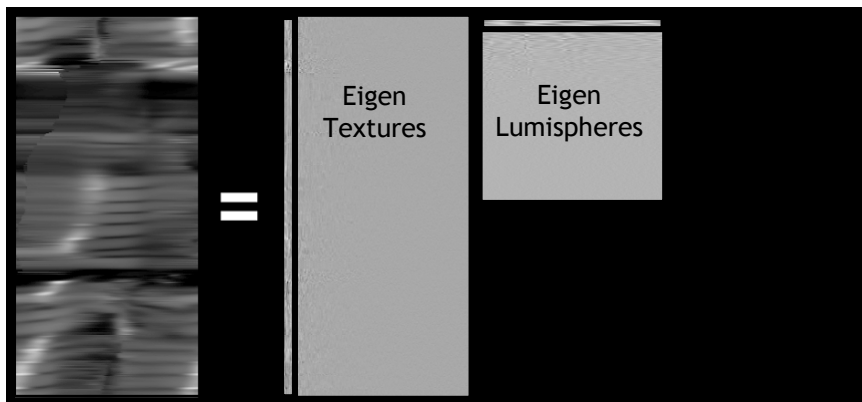
Singular value decomposition



SLF

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First eigenvectors

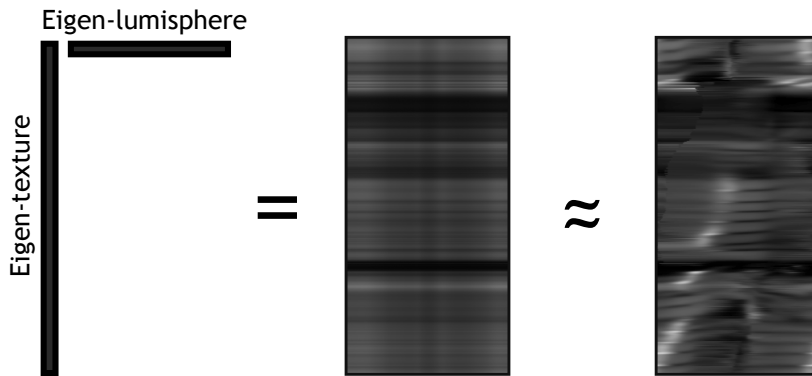


SLF

First eigentexture and corresponding
first eigenlumisphere

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Truncated SVD



Outer product of first eigen-texture and first eigen-lumisphere is closest rank 1 (separable) matrix.

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Surface Light Field -- Summary

- May be considered a compression scheme for light field data.
- 3D geometry required!
- Questions:
 - (1) Do we need detailed 3D geometry?
 - (2) Isn't this texture mapping?

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