

Interactive Real-Time BRDF Editing under Environment Lighting

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Motivation

How do we edit an object's BRDF?

BRDF:
(Ashikhmin-Shirley)



$$\rho_{AS} = \frac{\sqrt{(n_u+1)(n_v+1)}}{8\pi} \frac{(\cos \theta_h)^{n_u} \cos^2 \phi_h + n_v \sin^2 \phi_h}{\theta_d \max(\cos \theta_l, \cos \theta_v)} F(\theta_d)$$

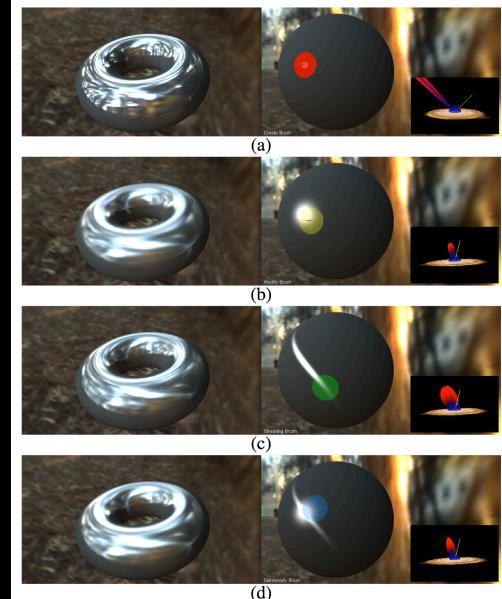
Ben-Artzi et al., 2006

Motivation

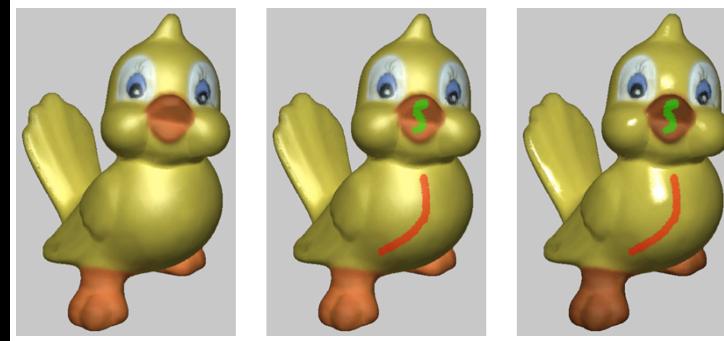
Goal:

- Real-time interactive BRDF editing system
- Paint edits directly on material
- Show objects under environment lighting
- Edit intuitive material properties
- Give artistic freedom while maintaining photorealism

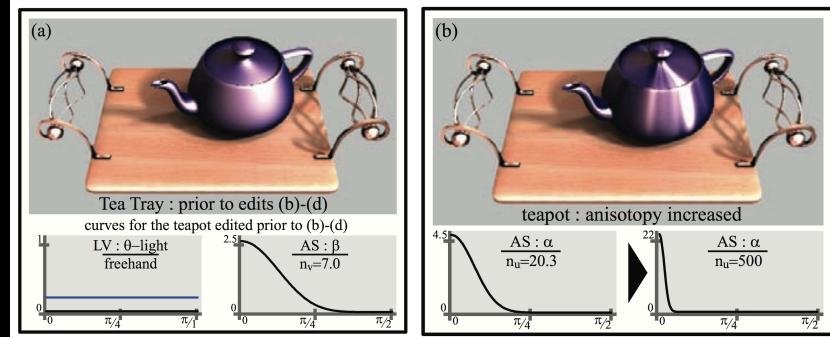
Background: Interactive BRDF Editing



Colbert & Pattanaik, 2006



Pellacini & Lawrence, 2007



Ben-Artzi et al., 2006

Implementation: Real-time editing

- Pre-render images of a sphere under environment and point source lighting
- Vary values of k_d , k_s and σ
- At runtime, add pre-rendered components together
- Interface to interactively edit diffuse colour and specular properties

Demo



Next Steps

What other editing options should the user have?

Next Steps

Proposed editing modes:

- Diffuse colour

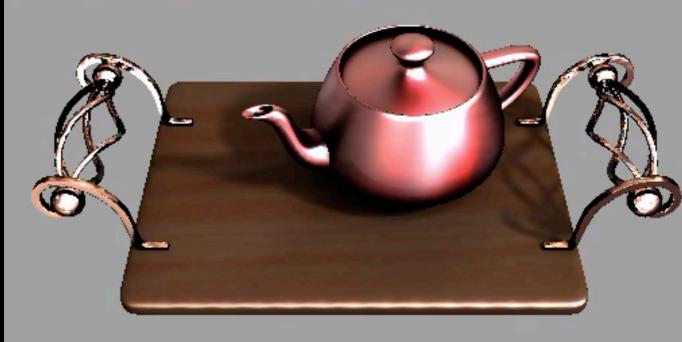


Matusik, 2003

Next Steps

Proposed editing modes:

- Diffuse colour
- Specular colour



Next Steps

Proposed editing modes:

- Diffuse colour
- Specular colour
- Sharpen / blur

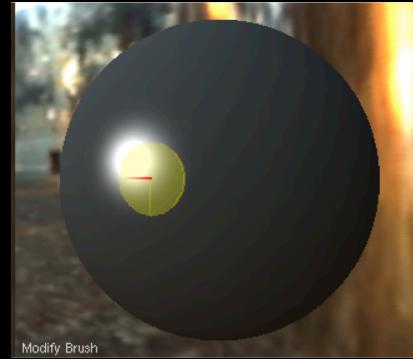


Ben-Artzi et al., 2006

Next Steps

Proposed editing modes:

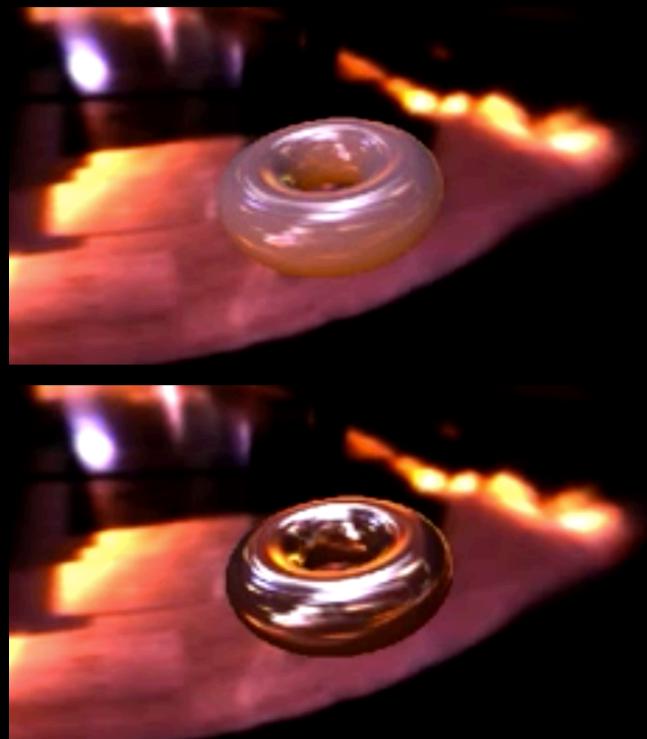
- Diffuse colour
- Specular colour
- Sharpen / blur
- Stretch highlights



Next Steps

Proposed editing modes:

- Diffuse colour
- Specular colour
- Sharpen / blur
- Stretch highlights
- Metallic-ness



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Options for all modes:

- Brush
- Fill
- Clone

Thank you!

Questions?