



Computer  
Graphics  
Charles  
University

# My Work

Jiří Vorba

Charles University in Prague

Faculty of Mathematics and Physics

# Content

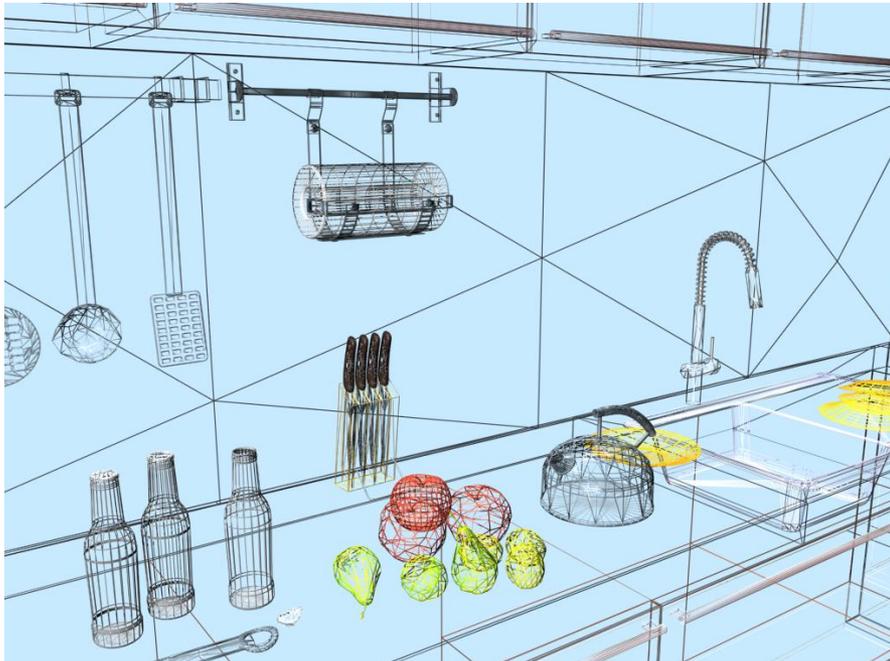
- About myself
- My previous work
- My current work

# About myself

- Graduated in 2011
  - MFF, Field of Computer Graphics
  
- Currently
  - first grade Ph.D. student
  - MFF, Computer Graphics Group

# Field of Interest

- ❑ Realistic image synthesis (rendering)
- ❑ Chasing the ultimate realism



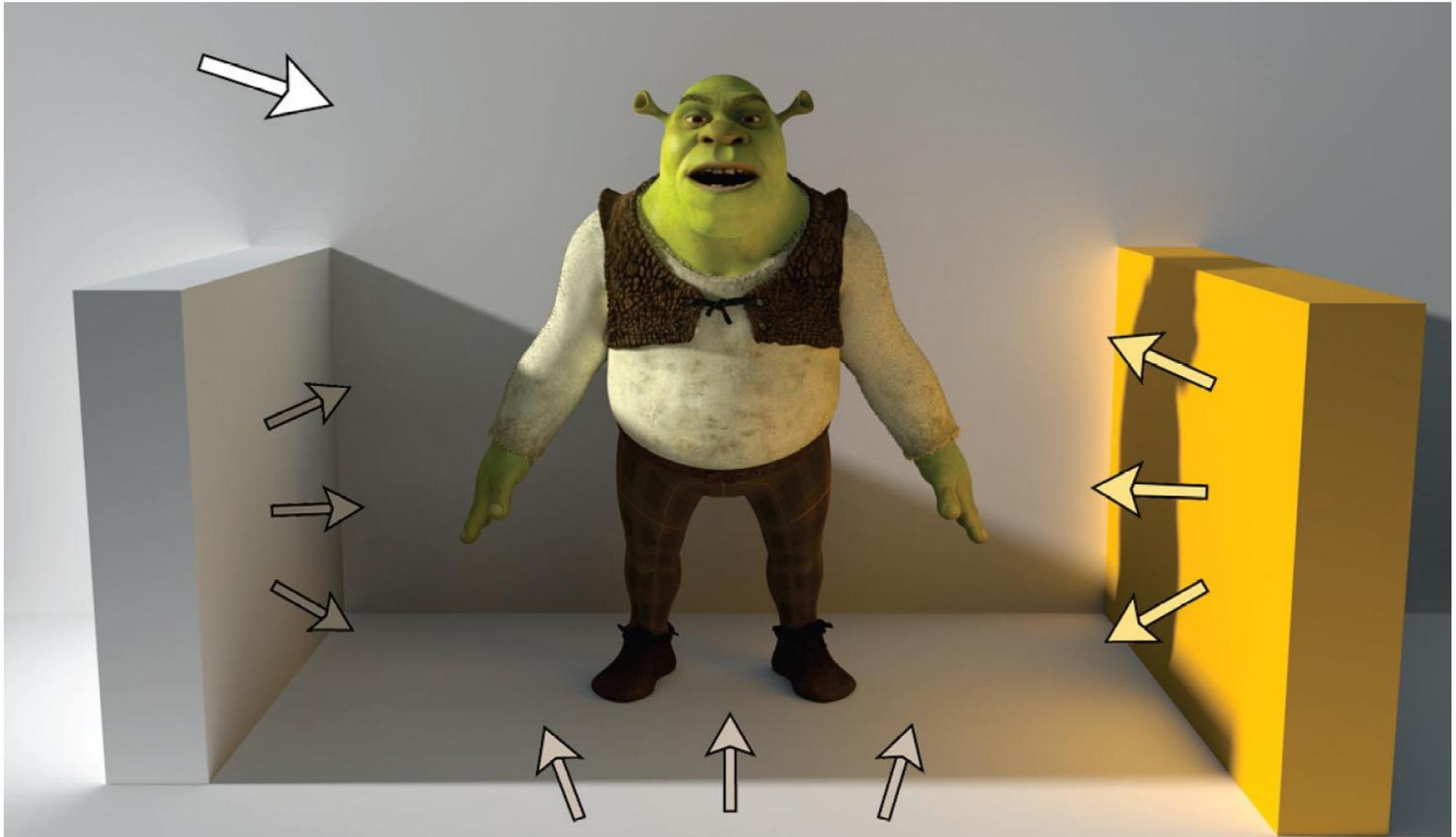


# Direct illumination





# Global illumination



# My previous work

- Master's thesis

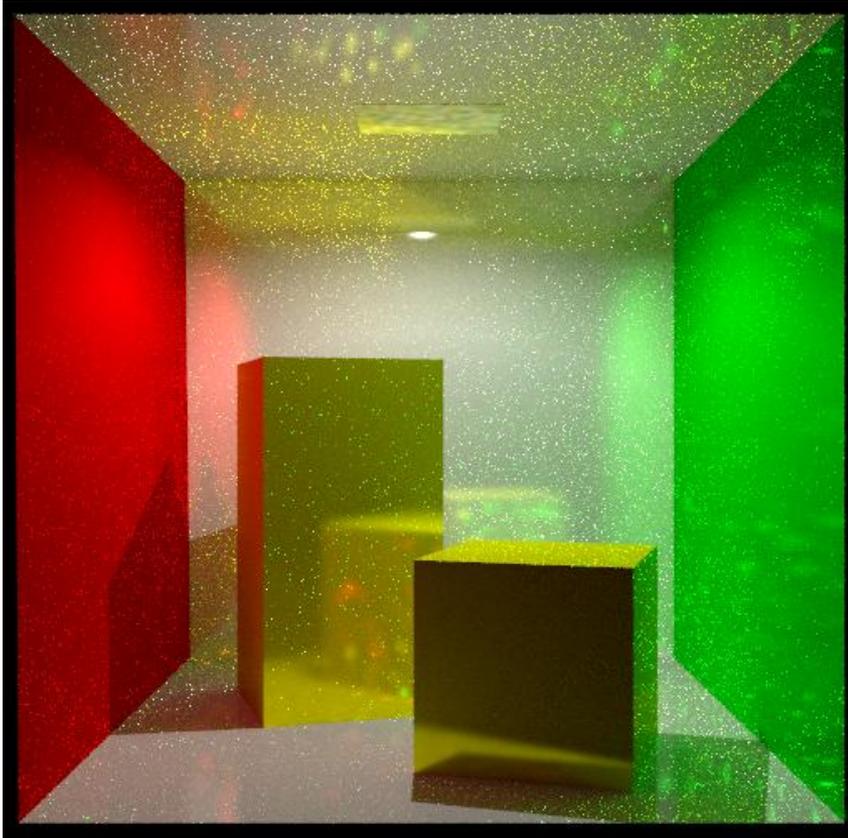
- Optimal Strategy for Connecting Light Paths in Bidirectional Methods for Global Illumination Computation

- Problem:

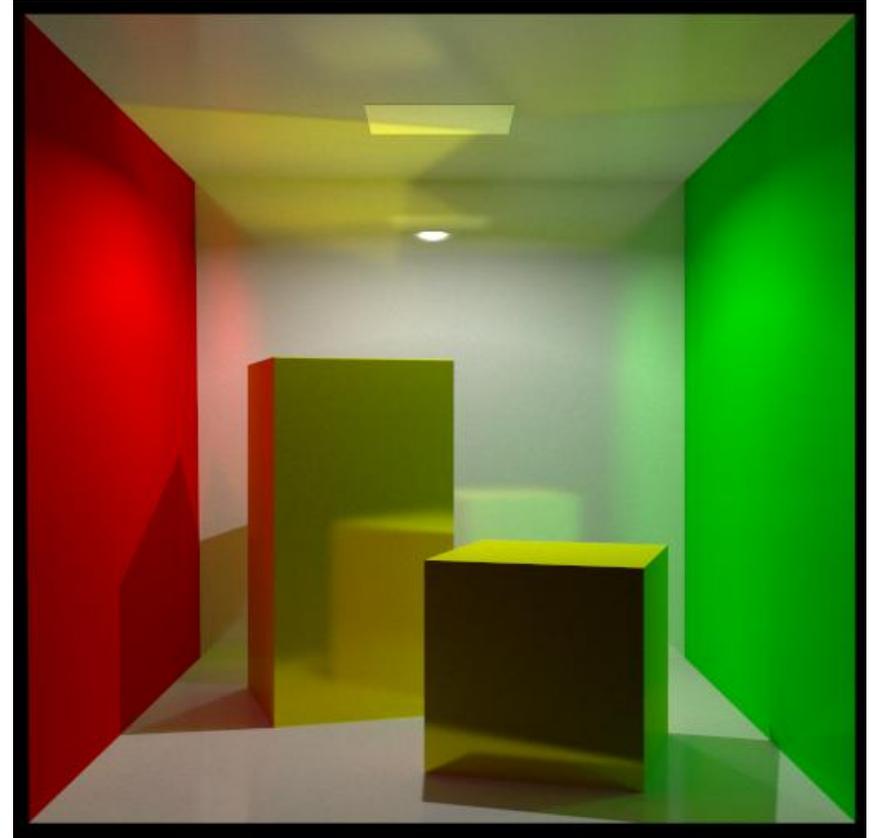
- No state-of-the-art algorithm can handle totally glossy scenes



# Glossy scenes



Photon Mapping



**Progressive Bidirectional Photon Mapping**  
(Our algorithm)



# Another glossy scene



PBDPM (512x512, 1 day 3h on 6 cores)



Reference - PT  
(320x320, 4 days on 6 cores)



# CESCG



TECHNISCHE UNIVERSITÄT WIEN  
Institut für Computergraphik und Algorithmen  
Abteilung für Computergraphik



## Central European Seminar on Computer Graphics for students

Michael Wimmer, Martin Ilcik

previously organised by Andreas Traxler, Ivan Viola, Thomas Theußl, Helwig Hauser and Georg Zotti

- Support CESC G
- General Information
- Organization



## Bidirectional Photon Mapping

Jiří Vorba

*Supervised by: Jaroslav Křivánek*

Charles University, Prague

### Abstract

This paper introduces a method for optimal combination of light paths generated from the camera and from the light sources in the photon mapping algorithm used for computing global illumination. Our method is based on Multiple Importance Sampling, a general approach, introduced by

the latter by replacing the final gather heuristic by a more principled approach. The original photon mapping performs the radiance estimate from the photon map only at the end of the final gather rays and differ between "global" and "caustic" photon map while we use a combination of various path connection strategies corresponding to a photon map estimate performed at different vertices of the full

# My present work

- ❑ Global Illumination
  - ❑ Data-driven sampling of illumination
- ❑ Jaroslav Křivánek, Ondřej Karlík



Computer  
Graphics  
Charles  
University

Thank you for your attention!