

State of the Art in Photon Density Estimation:

Introduction

SIGGRAPH 2012 Courses

THURSDAY, 9 AUGUST 2:00 PM - 5:15 PM | Room 408B



Organizers

- Toshiya Hachisuka (Aarhus University)
- Wojciech Jarosz (Disney Research Zürich)





VC 511

Piotr Pieransk - Physics around us



Wikimedia Commons



Why Photon Density Estimation?

- Intuitive
 - Trace photons as in the real world
- Versatile
 - Lots of illumination effects by one algorithm
- Customizable
 - Artist-friendly and adaptable to production pipelines



What you get out of this course

- Trends in photon density estimation
- Core ideas on recent technical development
- Cover both practice and theory
- **Presented by the original inventors**



1) Regular Photon Density Estimation

- **Photon Mapping Basics [15 minutes]**
 - *Henrik Wann Jensen (UC San Diego)*
- **Photon Relaxation [15 minutes]**
 - *Ben Spencer (Swansea University)*
- **Photon Differentials [15 minutes]**
 - *Jeppe Revall Frisvad (Technical University of Denmark)*



2) Progressive Photon Density Estimation

- **Progressive Photon Mapping Basics [10 minutes]**
 - *Toshiya Hachisuka (Aarhus University)*
- **Progressive Photon Mapping Extensions [15 minutes]**
 - *Toshiya Hachisuka (Aarhus University)*
- **Probabilistic Formulation of PPM [15 minutes]**
 - *Matthias Zwicker (University of Bern)*



3) Density Estimation in Participating Media

- **Participating Media Basics [10 minutes]**
 - *Wojciech Jarosz (Disney Research Zürich)*
- **Progressive EM [15 minutes]**
 - *Wenzel Jakob (Cornell University)*
- **From Photons to Beams [15 minutes]**
 - *Wojciech Jarosz (Disney Research Zürich)*



4) Photon Density Estimation in Industry

- **Photon Beams in *Tangled*** [15 minutes]
 - *Michael Kaschalk & Andrew Selle (Walt Disney Animation Studios)*
- **Photon Mapping in RenderMan** [15 minutes]
 - *Per Christensen (Pixar)*
- **PPM in LuxRender** [15 minutes]
 - *Guillaume Bouchard (Université Claude Bernard Lyon 1, CNRS)*



Course Webpage

<http://cs.au.dk/~toshiya/starpm2012>
(updated course notes and slides)

Enjoy!