

Modeling and Rendering Techniques – Practice Class

Class #1

September 23rd, 2008

Mgr. Ing. Tomáš Ágošton
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Overview

- ▶ Intro
- ▶ MaRT Practice Class 2007 Summary
- ▶ MaRT Practice Class 2008 Objectives



Intro

Modeling and Rendering Techniques – Practice Class

Class #1

September 23rd, 2008

Intro – I.

▶ Modeling and Rendering Techniques

▶ Lectures

- ▶ with doc. RNDr. Roman Ďurikovič, PhD.
- ▶ Hall A, 9:50 every Monday, 2 hours long

▶ Practice classes

- ▶ with Mgr. Ing. Tomáš Ágošton
- ▶ with Mgr. Michal Hučko
- ▶ Hall B, 14:50 every Tuesday, 2 hours long



Intro – II.

▶ About Tomáš Ágošton

- ▶ Master Degree in
 - ▶ computer science / computer graphics (2006)
 - ▶ national economics / economic policy (2007)
- ▶ Currently a PhD student (since 2006) on the field of
 - ▶ real-time rendering
 - ▶ visual appearance
 - ▶ global illumination
- ▶ Co-founder and CEO of Abyss Studios, Ltd.
- ▶ You can reach him at:
 - ▶ tomas.agoston@abyss-studios.sk
 - ▶ 0905/360 066



Intro – III.

- ▶ **About Michal Hučko**

- ▶ Master Degree in

- ▶ computer science / computer graphics (2008)

- ▶ Currently a PhD student (since 2008) on the field of

- ▶ volumetric rendering

- ▶ You can reach him at:

- ▶ michal.hucko@gmail.com



Intro – IV.

▶ Practice classes

- ▶ Will not take place in a computer lab
- ▶ Will be held in form of presentations and showcases
- ▶ Topics will be loosely related to lectures
- ▶ Absence policy
 - ▶ *“Each absence of a lecture will be counted and 3 points will be deducted from the final grade. Two absences will be allowed with no penalty with the prior approval of the instructor.”*



MaRT Practice Class 2007 Summary

Modeling and Rendering Techniques – Practice Class

Class #1

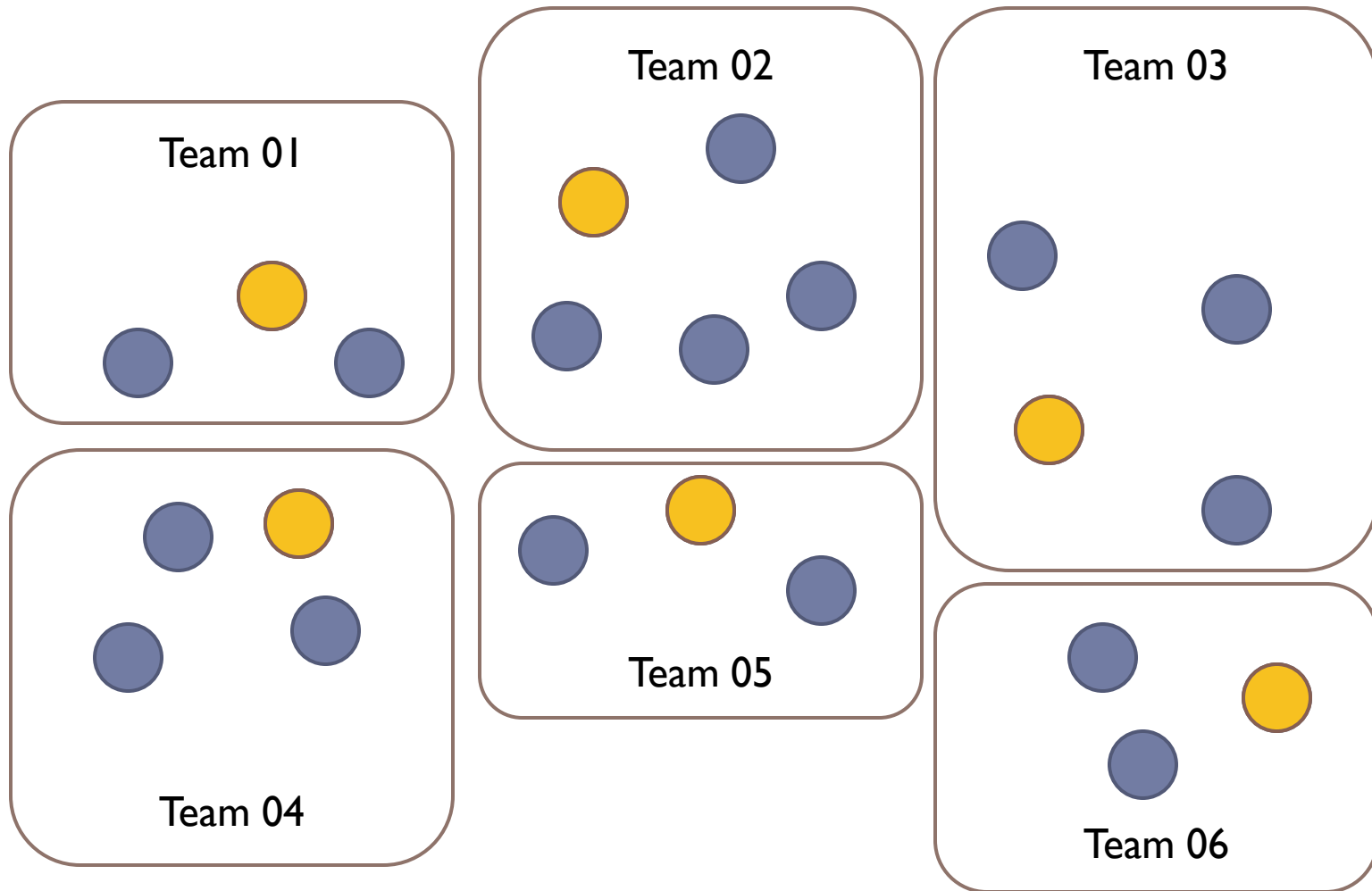
September 23rd, 2008

MaRT Practice Class 2007 Summary – I.

- ▶ Approx. 80 students attended
- ▶ Students were split into 18 teams
- ▶ Each team had
 - ▶ 3-5 members
 - ▶ a *Team leader*, which was responsible for communication
 - ▶ three tasks
 - ▶ to study a given topic and make a presentation on a given date
 - ▶ to measure car paint samples with provided measurement devices
 - ▶ to model and render a car paint in a 3d modeling application (Blender, Max, ..)

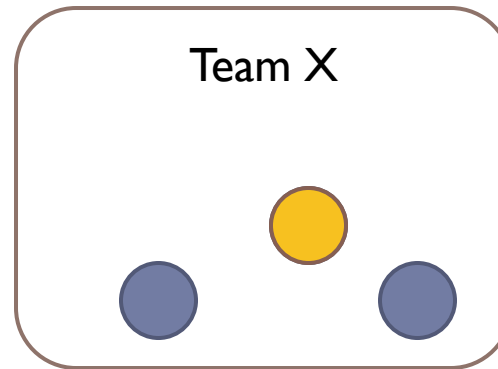


MaRT Practice Class 2007 Summary – II.



MaRT Practice Class 2007 Summary – III.

Objectives



Presentation



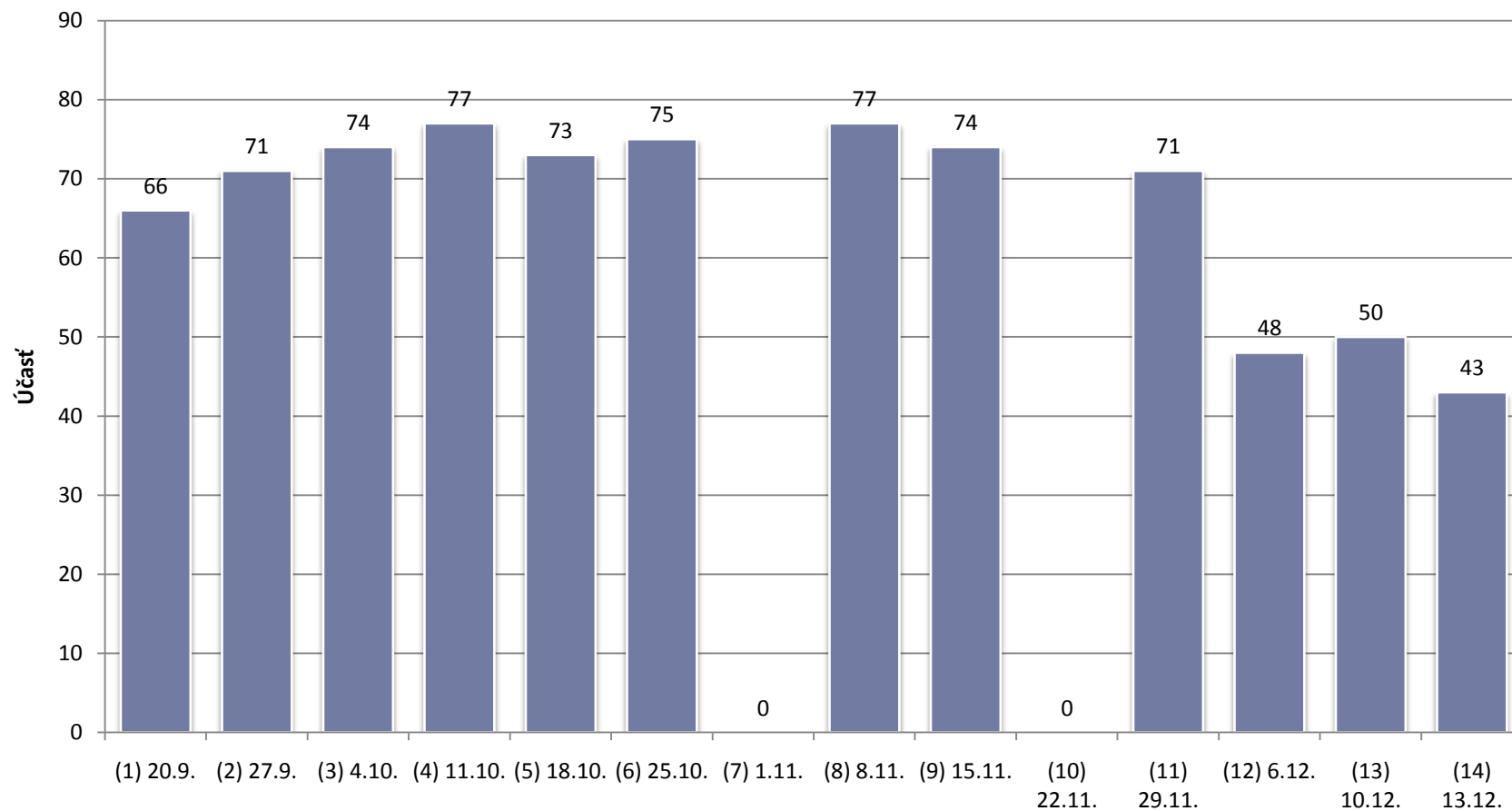
Car-paint Measuring



Modeling & Rendering



MaRT Practice Class 2007 Summary – IV.





MaRT Practice Class 2007 Summary – V.

Presentation Topics List:

- ▶ Blender User Interface (10/4/2007)
- ▶ NURBS Modeling (10/4/2007)
- ▶ SubDivision Modeling (10/11/2007)
- ▶ Simple Scene (10/11/2007)
- ▶ Textures (10/18/2007)
- ▶ Lights (10/18/2007)
- ▶ Rendering (10/25/2007)
- ▶ Particle Systems (10/25/2007)
- ▶ PR Material Synthesis for VrBa (11/8/2007)
- ▶ Non-PR Rendering (11/8/2007)
- ▶ Material Representation Models (11/8/2007)
- ▶ Car Paint Representation (11/29/2007)
- ▶ Advanced Organic Modeling (11/15/2007)
- ▶ Advanced Optical Effects (11/29/2007)
- ▶ Physically Based Modeling (12/6/2007)
- ▶ Procedural Modeling (12/6/2007)
- ▶ Rendering Pipeline Scalability (12/10/2007)
- ▶ Hair and Fur (12/10/2007)
- ▶ M&R in Game Industry (12/10/2007)
- ▶ M&R in Film Industry (12/13/2007)
- ▶ M&R in Research (12/13/2007)
- ▶ Global Illumination (12/13/2007)



MaRT Practice Class 2007 Summary – VI.



“Hollywood-style filmmaking”

- Five main stages:
 - Development,
 - preproduction,
 - production,
 - post-production,
 - distribution.
- This production cycle typically takes 3 years



Subsurface scattering

- method to improve translucent materials rendering
- can observe on wax, marble, skin, milk...



Development

- **Main idea** - book, other films, original ideas, ...
- **Step Outline**
- **Screenplay** (many times rewritten to improve the dramatization, dialogs, characters)
- Finding distributor
- Director



Preproduction

- The movie is designed and planned
- **Production company** - budget, costumes, makeup, music, sound, camera, ...
- Director, casting director, actors, production and location manager, director of photography, storyboard designer, sound designer, music composer, choreographer, ...



How it works

- light penetrates the surface of a translucent object
- travels and interacts with material
- exits



Real materials

- slightly translucent
- light is absorbed, scattered, and re-emitted

Production

- Production is actual creation of a film.
- More crew - script supervisor, assistant directors, stills photographer, ...
- Shooting



Production

- Production is actual creation of a film.
- More crew - script supervisor, assistant directors, stills photographer, ...
- Shooting



Absorption

- the further through the material light travels, the greater the proportion absorbed



MaRT Practice Class 2007 Summary – VII.



MaRT Practice Class 2007 Summary – VIII.

- ▶ Personal observations and feedback from students



MaRT Practice Class 2008

Objectives

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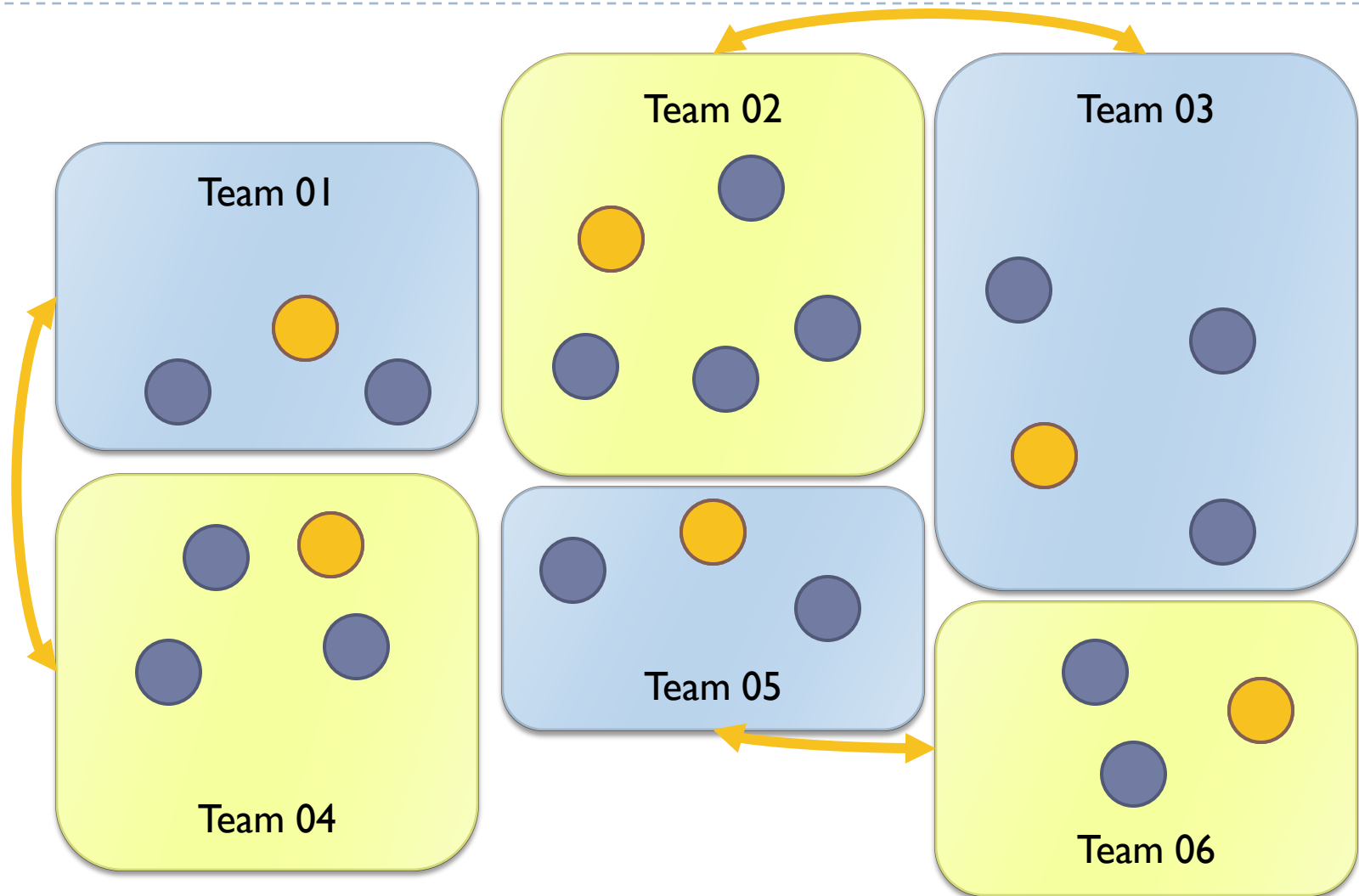
September 23rd, 2008

MaRT Practice Class 2008 Objectives – I.

- ▶ **NEW: Differences to previous years**
 - ▶ More tasks
 - ▶ Each teams must pick one from two assignments (NEW)
 - ▶ implementing a small application with a particular algorithm
 - ▶ modeling and rendering a car paint
 - ▶ Teams must pair with a team with another assignment (NEW)
 - ▶ Mid-semester milestone (NEW)
 - ▶ Additionally a research paper must be presented (NEW)
 - ▶ Final report is required (NEW)



MaRT Practice Class 2008 Objectives – II.



MaRT Practice Class 2008 Objectives – III.

- ▶ NEW: Differences to previous years
 - ▶ More tasks
 - ▶ Each teams must **pick one from two assignments** (NEW)
 - ▶ implementing a small application with a particular algorithm
 - ▶ modeling and rendering a car paint
 - ▶ Teams must **pair with a team** with another assignment (NEW)
 - ▶ Mid-semester **milestone** (NEW)
 - ▶ Additionally a **research paper** must be presented (NEW)
 - ▶ **Final report** is required (NEW)



MaRT Practice Class 2008 Objectives – IV.

▶ Presentation

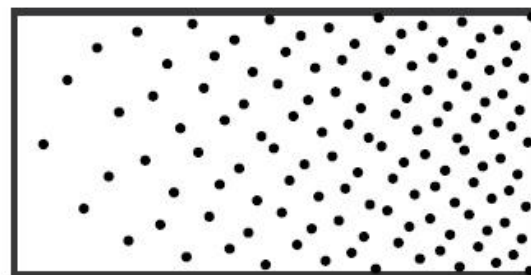
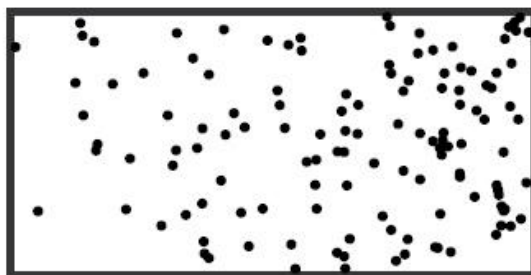
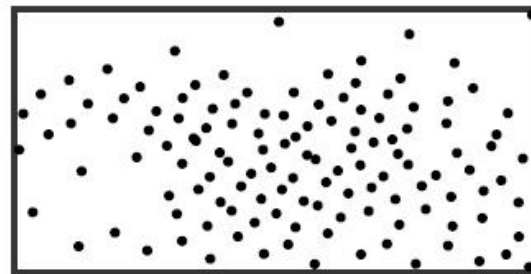
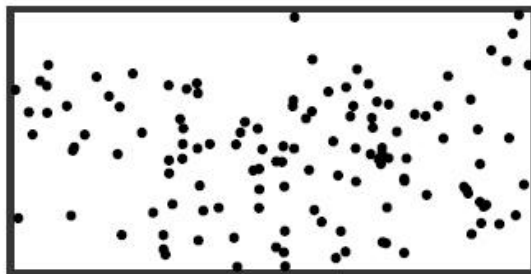
- ▶ Pick a topic & date
- ▶ NEW: Pick a research paper
- ▶ Prepare presentation and showcase in Blender or other software (20 min. max.)
- ▶ NEW: Prepare presentation of the paper (10 min. max.)



MaRT Practice Class 2008 Objectives – V.

- ▶ **Assignment I – Coding an application (NEW)**
 - ▶ Pick a paper on environment map sampling (available)
 - ▶ Create an application that converts a HDR map to multiple point / directional light sources
 - ▶ Interactive GUI is required (milestone!!!)
 - ▶ Export lights to 3d application of the other team
 - ▶ Create a report together with the other team

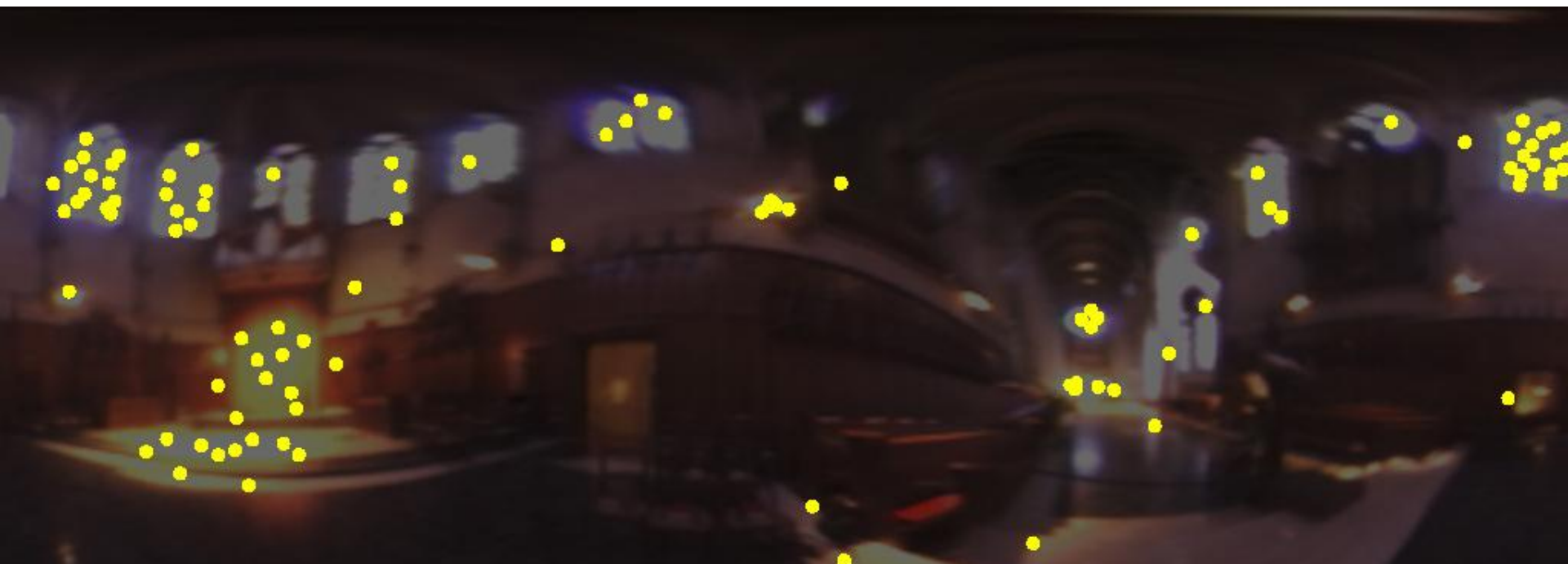




Importance Maps

Random

Hammersley



MaRT Practice Class 2008 Objectives – VI.

- ▶ **Assignment II – Modeling and Rendering a Car paint**
 - ▶ Pick a car paint reference (available)
 - ▶ Get a car model (available)
 - ▶ Create the car paint model / material in preferred 3d application
 - ▶ Use the provided tutorial (available)
 - ▶ Create a simple light setup and render (milestone!!!)
 - ▶ Validate the car-paint material model
 - ▶ Use the exported lights of the other team
 - ▶ Create the report with the other team





MaRT Practice Class 2008 Objectives – VII.

- ▶ **Final Rating**

- ▶ Presence
- ▶ Presentations
- ▶ Final
- ▶ Co-operative result of both teams
 - ▶ Partial results will be rated if problems occur



Lectures

- ▶ **NOTE: Work as team in lectures also!!! (NEW)**
 - ▶ Study paper and prepare questions in team



Questions

???



Thank You

