

Computer Graphics MAP-i 2009/2010

Legend:

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Lecture	Resp.	Subject	Observations
1 22-Fev	BSS	1. Introduction and organization of the course	
2 1-Mar	JM	2. 3D Modelling	
		a. Overview of Generic 3D Representations	
		1. Polygonal, and Tetrahedral meshes	
		2. Voxel-based representations	
		3. Explicit (functional) representations	
		b. Current representation techniques	
		1. Multi-resolution and view-dependent meshes	
3 8-Mar	AC	2. Constructive Volume Geometry for volume data sets	
		c. Procedural Modelling	
		1. 1. Definition and motivation	
		2. Procedural Modelling Techniques	
4 15-Mar	AC	3. Procedural Modelling of Virtual Environments	Monographs Assignment 1
		3. Rendering	
		a. Visibility, Textures, Local Illumination	
		b. Rendering Pipeline and Graphics Hardware	
		1. Acceleration Techniques for the Rendering Pipeline	
		2. Texture definition, filtering and mipmapping	
		3. Visibility and View Frustum	
4. Local Illumination and Graphic Cards			

Lecture	Resp.	Subject	Observations
5,6 22-Mar 12-Abr	LPS	4. Physically Based Rendering (PBR)	Assignment 2
		a. The BRDF and the Rendering Equation (RE)	
		b. Numerical Solutions for the RE	
		i. Monte Carlo Ray Tracing	
		ii. Photon Mapping	
		iii. Radiosity	
7,8 19,26 Apr	ARF	5. Parallel and Distributed Rendering	
		a. Modern use of GPU - Graphics Processor Units	
		i. The architecture of the GPU	
		ii. GPU Programming	
		iii. Geometry shaders	
		iv. GPU capacities and limitations	
9 3-May	AAS	6. High Performance Physically Based Rendering	
		a. Parallel Ray Tracing	
		b. Parallel Radiosity	
		c. Rendering on the Grid	
		d. Interactive Ray Tracing	
10 10-May		Students' presentations	Presentation of Assignment 1
11 17-May	BSS	7. Data and Information Visualization	
		a. Definition and model	
		b. Characteristics of the data	
		c. Visualization techniques	
12 24-May		Students' presentations	Presentation of Assignment 2
13 31-May	BSS	Data and Information Visualization (cont.)	
		d. Visualization algorithms	
		e. Evaluation of visualizations	
		f. Applications	
14 7-Jun		Students' presentations	Presentation of Monographs

Assessments

- two main components:
 - 2 small project assignments (50%)

- Monograph writing (50%)
- the small projects can be:
 - software development (applying theoretical concepts)
 - critical analysis to a chosen technique, algorithm, application area, etc.
 - Seminal or state of the art paper presentation
- The monograph takes the form of a survey and will be oriented for a deeper discussion of several solutions of the elected problem.

Specifically:

- First assignment consists of the development of an application and includes an oral presentation
- Second assignment consists of the bibliographic research and presentation about a given subject
- Monograph includes an oral presentation