Introduction to VRML97

Computer Graphics Course
(Half-Day Tutorial)

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1. OVERVIEW OF THE COURSE

In this course an introduction to the basic concepts of VRML97 will be given. The key features of VRML will be presented based on many examples illustrating the functionality and syntactical structure of each key feature.

The course will introduce how a VRML scene graph is structured, how a static VRML model looks like and move on to topics on how to create behavior and interaction in VRML scenes using basic VRML concepts and mechanisms such as event routing, sensors and interpolators. Moreover an introduction of the VRML prototyping mechanism will be given and the functionality of the VRML Java programming interfaces wilt be introduced based on ample and easily understandable example material from recent courses.

Finally mis course will give an overview on available software tools for creating and browsing VRML content and conclude with a brief outlook on VRML working groups and planned enhancements to VRML.

SHORT INTRODUCTION AND OVERVIEW OF BASIC CONCEPTS

INCLUDING MANY EXAMPLES

- Geometry, Shapes
- Illumination and Lighting
- Camera
- Textures, Movie Textures, Text
- Sound
- Interpolation, Time Dependencies, Sensors
- Animation and Interaction
- Event Routing
- Prototyping
- Java Programming Interfaces of VRML (JSAI, EAI)

CREATING DYNAMIC WORLDS

INCLUDING MANY EXAMPLES

- Using Event Routing, Interpolators and Sensors
- Using Prototypes
- Using the Java Interfaces of VRML: JSAI (Java Scripting Application Interface)
- Using the Java Interfaces of VRML: EAI (External Authoring Interface)

OVERVIEW OF VRML TOOLS

CURRENT DEVELOPMENTS

2. ABOUT THE AUTHORS

The authors have born worked in me area of computer graphics for long and own experience with VRML and Java programming from the outset. In current research and application projects they are developing VRML tools and researching methods for automated authoring support for creating VRML-scenes and applications for industrial and educational areas.

The authors have given a two days course introducing VRML, its nincaonaiity and its Java programming interfaces at Fraunhofer IGD, in April 1997.

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Navigation of Intelligent Agents Jn VR systems S Games

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The problem of intelligent agent navigation is of key importance in most VR applications and games. The robust and general solution of this problem forms the core part of behavioral AI control of the agents. Overview of the existing techniques (theoretical motion planning), as well as the new approaches are discussed in this Course.

Realistic lighting in real-time 3D applications (LightMaps)

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Although many methods have been proposed to compute the photorealistic-quality lighting data (radiosity, raytracing), the specific approaches must be designed to recreate appealing lighting effects in real-rime 3D applications. One of the most effective approaches is based on the use of so-called light maps. In this course we survey the general light map technique touching many of the problems arising during light map creation on the preprocessing and their use in real-time.

Java-technology

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Introduction into Java-technology

1. Java: Is it publicity campaign or an innovaton in programming?
2. Java features and scope
3. Java software architecture
4. Main constructions, standard libraries, standard extensions.
5. Java Beans: development technology
6. Java for memet and mtranet
7. Java: hardware implementations

Distributed programming in Java

1. Distributed applications design
2. Java for distributed application development
3. Java and databases
4. Remote communication of Java-objects
5. Java and CORBA-technology
6. RMI and CORBA
7. Serviets vs. Applets

Введение в Java-технологию

1. Java - рекламная компания или новое в программировании?
2. Специфика языка Java и сфера применения 3- Архитектура программного обеспечения, создаваемого на Java
4. Ключевые констукции, стандартные библиотеки, стандартные расширения
5. Технология компонентной разработки Java Beans
6. Java и Web-технологии, Java и корпоративный Intranet
7. Аппаратные решения, ориентированные на Java- технологии

Распределенное программирование на Java

1. Специфика проектирования распределенных приложений
2. Java как язык для создания распределенных приложений
3. Взаимодействие Java и баз данных
4. Взаимодействие удаленных Java-объектов
5. Поддержка в Java технологии CORBA
6. RMI и СОКВА
7. Сервлеты и апплеты - что актуальнее?

Cortical Transform and related issues. Framework schemes for Real World Computing, 3D automatic digitizing from pictures, mesh and texture simplification, and fast 3D rendering

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Key issues of this tutorial are to present a short survey in Neural Network classic techniques, introduce after the cortical transform, and mainly describe framework schemes for major Computer Graphics problems such as:

3D automatic input from pictures, (3D Real World computing) 3D mesh and texture simplification, and fast 3D rendering.

In particular, the following topics will be introduced:
• Cortical structures general framework.
• Low level vision generalized filters.

Region of interest, (attention zones) hypercomplex filters,
Automatic perceptive grouping (segmentation) and application to polygon retrieval on pictures.
Summary of applications in compression techniques. (VHS magnetic tapes).
Introduce schemes for 3D analysis and automatic mesh digitizing from pictures.
Application schemes for 3D mesh simplification algorithms.
Application schemes for fast real time rendering on standard 3D cards.

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