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COURSE NOTES 9

PHIGS PLUS: ADVANCED THREE-DIMENSIONAL GRAPHICS WITH A STANDARD APPLICATION PROGRAMMER INTERFACE

Chair
Edy Henderson
Sun Microsystems, Inc.

Lecturers
Henri Gouraud
Digital P.R.L.
Griff Hamlin
McDonnell Douglas
Edy Henderson
Sun Microsystems, Inc.
Eileen McGinnis
Sun Microsystems, Inc.
Mike Stapleton
System Simulation Ltd.
Spencer Thomas
University of Michigan

Abstract of Course

Attendees will have the first Siggraph opportunity to study concepts of the soon-to-be-standardized ISO extensions to PHIGS, known as PHIGS PLUS, which define advanced rendering where PHIGS left off. PHIGS PLUS includes advanced geometries for surface modeling including NURBs (Non-Uniform Rational B-Splines) and advanced 3D rendering for shading, lighting, and depth cueing, applying 3D graphics standards to fields like MCAD and molecular modeling. These industries are quickly moving over to PHIGS PLUS. Here is an opportunity to understand where the next phase of graphics standards is going, and why. There will also be a "live" demonstration using real-time graphics running on a local workstation with displays projected for viewing by the class. (This will be the same demonstration software that will be running on the show floor.)

This is the first Siggraph course to introduce PHIGS PLUS extensions to the PHIGS graphics standard. The course will examine the history and current status of the PHIGS PLUS standardization process. The student will gain understanding of the rapid move within industry to adopt implementations of the PHIGS PLUS concepts. The lecturers will give a technical examination of PHIGS PLUS architecture and functionality. The course will also include what is NOT in PHIGS PLUS and why. The course includes insights from an application's point of view showing how and when it is appropriate to use PHIGS PLUS.

PHIGS PLUS is the ANSI/ISO proposed extension to the PHIGS standard and is supported by multiple vendors as the API for providing advanced rendering and advanced primitive geometries within the PHIGS environment. This course covers the evolution, architecture, and algorithms of PHIGS PLUS. The course explores the impact that the use of PHIGS PLUS might have on an application environment and investigates considerations that should be made by application and graphics-system implementors.

Lecturer Biographies

Henri Gouraud, Digital P.R.L.

Henri Gouraud is a member of the Research Staff of Digital's Paris Research Laboratory, and its Operations Manager. He was previously one of the founders of a small software company, Tangram, and prior to that consultant at Tecsi, a subsidiary of Compagine Générale d'Eléctricité. He obtained his PhD in 1971 from the University of Utah where he developped what is known as "Gouraud shading". He obtained his engineer's degree from Ecole Centrale in Paris.

Griff Hamlin, McDonnell Douglas

Griff Hamlin has been using PHIGS PLUS in an MCAD application at McDonnell Douglas for the past 2 years. Griff has 15 years of experience in computer graphics and graphics standards. While at Stellar Computer, Griff implemented PHIGS PLUS extensions to Stellar's PHIGS implementation, and participated on the committee to draft the original PHIGS PLUS document. Griff received a Ph.D. in Computer Science from U. of North Carolina, 1975.

Edy Henderson. Sun Microsystems, Inc.

Edy Henderson is the Engineering Manager of SunPHIGS, Sun Microsystems' implementation of PHIGS and PHIGS PLUS Extensions. Edy joined Sun Microsystem's Graphics Standards department in 1988. She has been involved in computer graphics for 12 years in the areas of ECAD, MCAD, scientific applications and graphics standards. She holds a BS in Mathematics from the University of Redlands.

Eileen McGinnis, Sun Microsystems, Inc.

Eileen McGinnis is Engineering Department Manager at Sun Microsystems, responsible for Sun's Graphics Standards Software, Performance and Verification. Her responsibilities include Sun's development of the public implementation of PEX, the 3D graphics extension to the X protocol, under contract to MIT. Eileen has been active in graphics standardization efforts for over 11 years, and has worked on the definitions of Core, GKS, GKS-3D, PHIGS, and PHIGS PLUS. She currently heads the US delegation to ISO in the area of Graphics Application Programmer's Interfaces (API's), including PHIGS, PHIGS PLUS, and GKS. Eileen holds an MS in Computer Science and Mathematics from Stanford.

Mike Stapleton, System Simulation Ltd.

Mike Stapleton is a Principle in System Simulation, A UK company specializing in multi-media systems design. Mike is the Chair of the British Standards Institute Panel of Graphics APIs including PHIGS and PHIGS PLUS. Mike holds degrees in Physics and Computer Science.

Spencer Thomas, University of Michigan, Dept. of Computer Science,

Spencer Thomas is an assistant professor in the EECS Department at the University of Michigan. He was previously on the faculty at University of Utah. In 1988, Spencer headed a team that produced a demonstration implementation of PEX (the PHIGS extension to X) for SIGGRAPH '88. Spencer Thomas received his Ph.D. in B-spline based modeling from the deparment of Computer Science at the University of Utah in 1984.

Schedule

8:00 - 8:30 Introduction / Edy Henderson

8:30 - 9:30 History and Concepts / Eileen McGinnis

9:30 - 9:45 *Break*

9:45 - 10:45 Technology - Advanced Primitives / Spencer Thomas

10:45 - 11:45 Technology - Advanced Rendering / Henri Gouraud

11:45 - 1:15 *Lunch*

1:15 - 1:45 Implementation Considerations / Edy Henderson

1:45 - 2:45 Application Programmer's Interface (API) / Mike Stapleton

2:45 - 3:00 *Break*

3:00 - 4:00 Application Programmer's Considerations / Griff Hamlin

4:00 - 4:30 Live PHIGS PLUS Demonstrations

4:30 - 5:00 Wrap-up Discussion, Q & A / All speakers

Table of Contents

Section I - Introduction / Edy Henderson I-1
PHIGS and PHIGS PLUS I-2
PHIGS PLUS Applications I-3
PHIGS, PHIGS PLUS, and PEX I-3
PHIGS PLUS Functionality Overview I-4
PHIGS and PHIGS PLUS Primitives I-5
PHIGS PLUS Attributes I-6
PHIGS PLUS Rendering I-6
Slides I-7
Section II - History and Concepts / Eileen McGinnis II-1
Evolution and Schedule II-2
PHIGS PLUS Work Plan II-3
Functional Goals of PHIGS PLUS II-4
System Goals of PHIGS PLUS II-5
NON Goals of PHIGS PLUS II-6
Trade Offs II-7
Weaknesses II-8
Unstable Areas II-9
PHIGS PLUS New Work Item (NWI) II-10
PHIGS and PHIGS PLUS Output Pipeline II-14
Section III - Technology - Advanced Primitives / Spencer Thomas III-1
Overview III-2
Motivation for the additions III-3
PHIGS limitations III-4
PHIGS PLUS objectives & scope III-5
The new technologies III-6
"With data" Primitives III-7
Mesh primitives III-8
Curve and Surface Primitives III-9
NURBS III-10
Integral III-11
Rational III-12
Trimmed surfaces III-13
Representational sufficiency III-14
Examples III-15
Choice of appropriate representation III-21
Trimming curves III-32
Approximation criteria III-35
Limitations III-39
Wrap-up III-40
Section IV - Technology - Advanced Rendering / Henri Gouraud IV-1
Outline IV-2
Motivation IV-3
PHIGS PLUS Colour Model IV-4
PHIGS PLUS Colour Spaces IV-5
PHIGS PLUS Rendering Pipeline IV-5
Lighting IV-6

Shading IV-9
Depth cueing IV-12
Colour Mapping IV-13
Data Mapping IV-16
Look up table IV-18
Section V - Implementation Considerations / Edy Henderson V-1
Workstation Dependent Differences V-2
Hardware Acceleration V-3
Hardware Architectures V-6
Section VI - API / Mike Stapleton VI-1
Introduction VI-2
PHIGS PLUS Programmers Model VI-2
Workstation and Implementation Dependencies VI-3
General Colour VI-3
Beyond the Polyline VI-4
NURBS Curves VI-4
Surfaces I - Faceted Primitives VI-5
Surfaces II - NURB Surfaces VI-6
Back face Processing VI-7
Lumière Light Sources VI-8
Data Mapping VI-9
Lighting and Shading VI-9
Depth Cueing VI-11
Colour VI-12
Extended or Modified PHIGS Functions VI-12
Section VII - Application Programmer's Considerations / Griff Hamlin
A Case Study VII-1
Introduction VII-2
Issues with Converting Existing Applications VII-2
PHIGS PLUS Machine Independence: how real is it today? VII-3
Performance Hints for Writing PHIGS PLUS Applications VII-5
Performance Graphs VIII-7
Section VIII - Demonstrations, Wrap-up, Q & A / All speakers VIII