

A Taxonomy of Graphics Clustering Techniques

Alexander Streit



What's it all about?

People are

- building computer clusters for VR

Because

- clusters are cheap and powerful...

But,

- there are many ways to do this.

SO...

WHICH IS BEST?

A Collection of Systems

**(Alphabetical order)
(non-exhaustive list)**

AnyGL

CAVElib

Chromium

Lightning-2

MetaBuffer

OpenSceneGraph

OpenSG

Sepia & Sepia-2

Syzygy

VR Juggler

WireGL

Which one is right for me?

Unless familiar with each, how do you know?

Trial and error to find “right” one.

What are the limitations of that system?

How do we compare systems?

Some sort of **classification system will help us**

Classification

The *Data-stage Classification System* provides fine-grained comparison between techniques.

It is based on the *Data-stage Application Model*

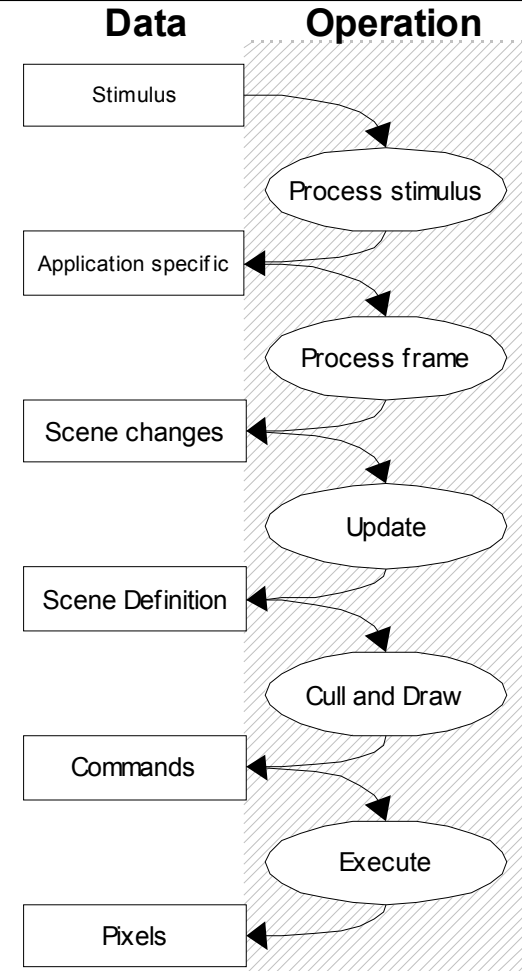
- Break-down of the process that is repeated for each frame.

What is the Data stage Application Model?

A complete break down of the graphics application into six *data stages*.

The stages are linked by processes that transform the data from one state to another.

The final product is pixel data, which is typically displayed to the user



Data stage Classification System

Assumption:

- There is always a “master” node and one or more “slave” nodes

Theory:

- The point at which *communication* with the slave nodes occurs forms the basis of the classification

Practice:

- Underpinned by the *data-stage application model*

Classified systems

AnyGL

CAVElib

Chromium

Lightning-2

MetaBuffer

OpenSceneGraph

OpenSG

Sepia & Sepia-2

Syzygy

VR Juggler

WireGL

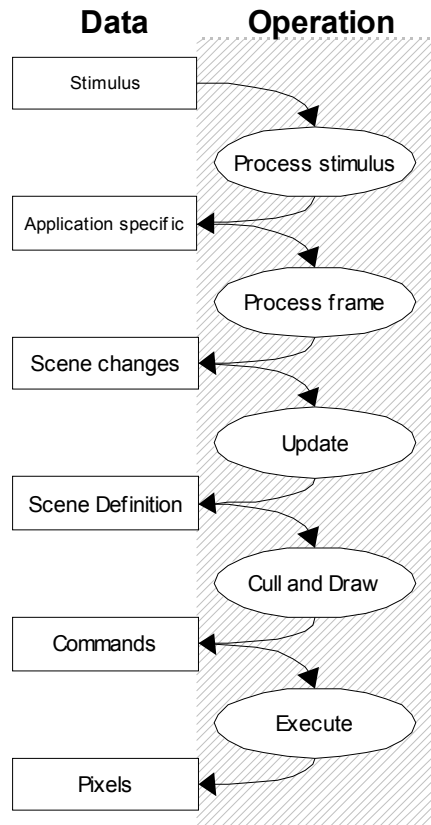
Stage	Projects
Stimulus	CAVElib, VR Juggler, Syzygy (M./S.)
Application Specific	N/A
Scene Changes	
Scene Definition	OpenSceneGraph, OpenSG, Syzygy (Dist. S.G.)
Command	WireGL, AnyGL, Chromium
Pixel	Lightning-2, Metabuffer, Sepia (1&2)

Discussion:

Data Requirements

Stage	Low	High
Stimulus	Single controller used in a coherent manner	Visualizations of detailed real-time data from an external source
Application Specific	Minimal applications such as walk-throughs	Complex simulations with many distributed processes
Scene Changes	Walk-throughs of static scenes or scenes with few changing elements	Dynamic simulations and visualizations involving continuous large-scale change
Scene Definition	Contained environments with limited detail	Complex, highly detailed and large scenes
Command	Objects with planar surfaces, few visible objects	Wide view containing many detailed objects with varying surface properties
Pixel	Low screen and color resolution	High resolution with auxiliary information (such as depth)

Questions?



Stage	Projects
Stimulus	CAVElib, VR Juggler, Syzygy (M./S.)
Application Specific	N/A
Scene Changes	
Scene Definition	OpenSceneGraph, OpenSG, Syzygy (Dist. S.G.)
Command	WireGL, AnyGL, Chromium
Pixel	Lightning-2, Metabuffer, Sepia (1&2)