GPGPU stream computing 2009
Jules Urbach
OTOY and LightStage LLC, CEO
LightStage + Visual FX: Benjamin Button

Virtual ‘Brad Pitt’

Rick Baker sculpture of ‘old’ Brad Pitt scanned into LightStage 5:
LightStage in Visual FX: Benjamin Button

Virtual ‘Brad Pitt’

Benjamin Button CG head rendered ‘offline’ using LightStage:
GPGPU stream computing 2009
Next Generation Art Pipelines

Ruby ‘2009’ – LightStage/OTOY
Maya Vs. LightStage/OTOY:

Ruby ‘2009’
Ruby ‘2008’

Maya Vs. LightStage/OTOY:

Ruby ‘2009’
Maya Vs. LightStage:
LightStage Art Pipeline using ATI Stream SDK

LightStage/OTOY = 100% photo real CG humans, objects and scenes in games

- Now, with ATI Stream, new LightStage advances are possible completely in real time, on today’s hardware.

- In the six months since Radeon 4870 was launched, real time rendering has finally converged with LightStage offline rendering at 4k+ resolutions.
Portable LightStage

**LightStage art pipeline opened to all artists and developers:**

Traditional LightStage (left) vs. portable LightStage (right):

*first steps towards low cost 3rd party mass adoption.*

Now entire environments can be ‘LightStaged’ from anywhere in the world.
OTOY Fusion Render Cloud

Server Side Rendering Overview:

- Content on FRC can deploy to any device (including mobile phones)
- Existing applications can be published on the cloud ‘as-is’
- Developers can immediately leverage next gen technology and APIs through FRC without waiting for consumers to upgrade their hardware/drivers.

Server side content side steps many obstacles:

- Software piracy
- Cheating
- Hacking

It also provides numerous benefits:

- Unlimited assets
- Instant on gameplay
- Rentable games
- Continuously evolving content
Developing and Publishing with FRC is simple

Existing applications already run great on the cloud

- Existing Win32/Win64 binaries on FRC are hosted ‘as-is’ – no source code or recompiling is necessary for well behaved apps.
- Hosted GDI/DX9+ apps are virtualized and accelerated by GPGPU/ATI Stream computing on FRC. Next gen FRC applications can scale to potentially unlimited numbers of remotely rendered instances.
- DX11 is 100% supported on FRC; Developers can target DX11 as a baseline and deploy their games for playback on any internet connected device.

Open publishing and distribution model through the cloud

- Developers and publishers can wrap their FRC apps/services into any HTML page or framework of their choosing.
- Full interoperability with other major cloud systems – TBA Q3 ’09.
- Major media and software publishers are first tier launch partners in Q3 ’09.
- Open development tools for 3rd party content creation to follow.
OTOY cloud SDK – Stream powered applications on FRC

OTOY cloud SDK will include core FRC development ‘modules’ for next generation content development:

- Simple but powerful scripting language for high level tasks
- LightStage pipeline will be 100% supported for photo real assets
- Raytracing and Voxel rendering (unlimited scene complexity, across unlimited number of GPUs – see GDC 2009 Ruby demo)
- OpenCL/DX11 wrapper for low level GPGPU/stream computing applications or OTOY 3rd party libraries
- OTOY virtualized wrappers for integrating today’s development tools and frameworks into next gen cloud content: .Net/Mono, Flash 10, Java, Lua 5.1, PHP
- Socket/JavaScript API for complete control of FRC applications/services through any client framework (i.e. Java, Flash, HTML, etc.)
3rd party plug-in architecture for OTOY rendering system:

Live interconnect with Adobe, Autodesk and SolidWorks art packages

YEBIS: *Masa Kawase’s Post FX library*

First fully integrated 3rd party plug-in for OTOY/FRC (see Ruby 2009 GDC demo)
Silicon Studio “YEBIS”

• High quality Post Effects library
• First 3rd Party plug-in for OTOY
• Various Post Effects:
  ▪ Spectral Glare/Glint
  ▪ Tone mapping
  ▪ Depth of Field
  ▪ HDR Motion blur
  ▪ Color Correction
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