“Creating believable/immersive content (how games and films imitate life – and each other)”

Chad Greene

Art Director

Overview

- Intro/About me
- Central Media@Microsoft
- Film → Games → Film
- Technology/Hardware

About Me

Born and raised in Sandusky, Ohio

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BGSU

- Bowling Green State University (Ohio)
- Graduated in 1992
  - Dual major: BFA Computer art & drawing
  - Using Atari STE's with 4 MB RAM
    - No saving to the hard drive– it was ALL on floppy disks!
    - 16 colors
    - All animation had to be scripted
    - All work was recorded straight to VCR
    - No internet or networking of computers

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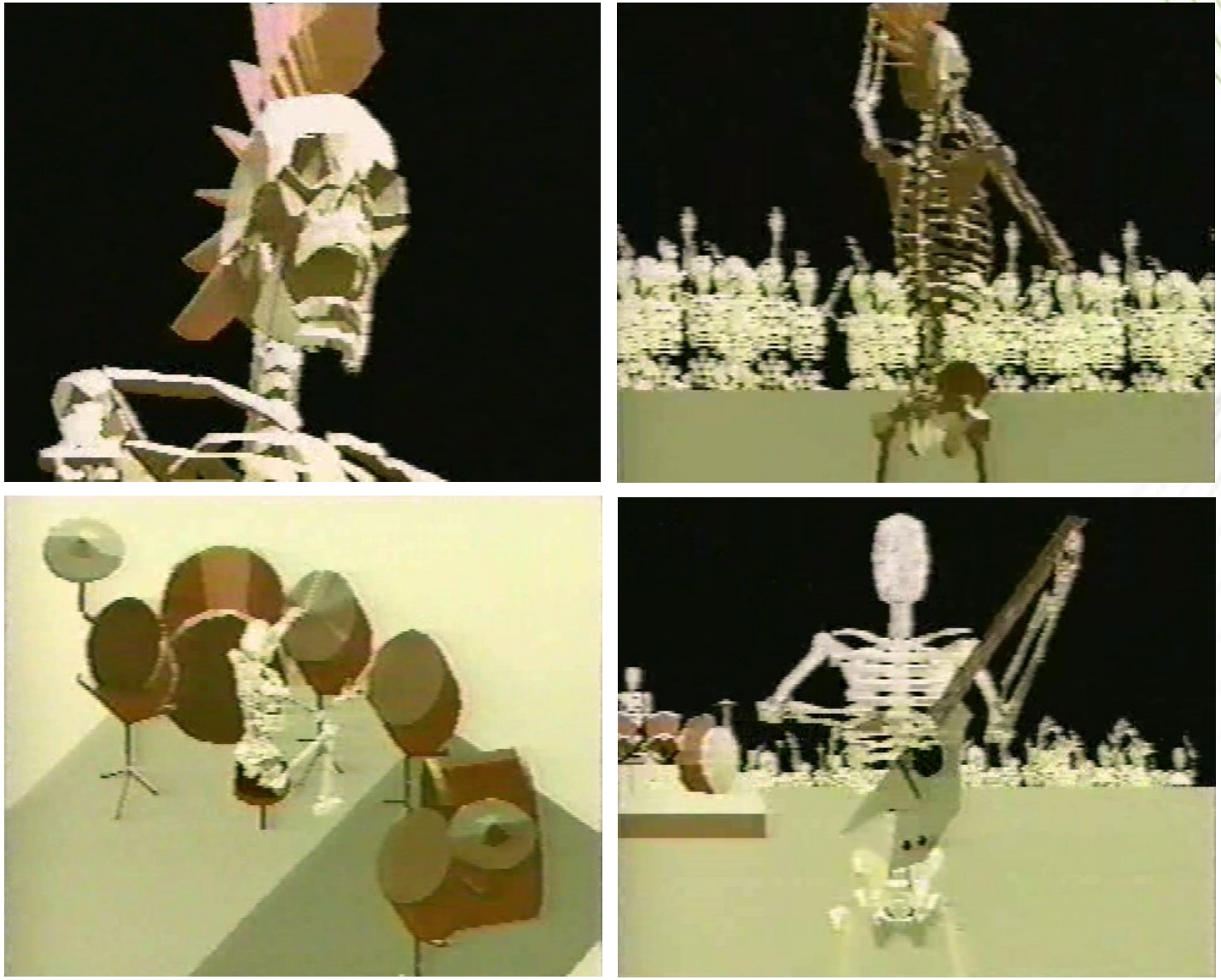

‘The Ungrateful Dead’ - 1991

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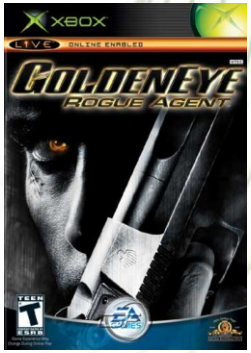
Work History

Work History

Twenty years of experience, working in film, video games, advertising/graphic design, and broadcast tv



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Current job/role – Art Director (Central Media @ Microsoft Studios)

- CM Group overview
  - Multi-discipline team (audio, graphic designer's, tech artist's, animators, concept artist's, modelers, vfx/lighting, etc)
  - Working on a range of projects that cover Xbox 360, Tablet/PC, Windows Phone and other entertainment related products

Microsoft Studios

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Current job/role – Art Director (Central Media @ Microsoft Studios)

My focus and challenges:

- Art Direction – Xbox 360, PC's/tablets, phones, and other entertainment related projects
- Immersive / believable content
- Workflows/pipelines for content creation
- Narrative Design / Transmedia
- New exploration – Kinect /Smart Glass

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Film → Games

Halo 1

- Graphic Improvements over the years → games getting closer to film
  - Tech impacts game creation
  - Normal maps
  - Dynamic lighting
  - Camera and vfx
- Film *and* games adapt tech from Siggraph/GDC and other conferences that feature the work of researchers and shared learning's from other developers

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Film → Games

Halo 4 – 343 Studios/Microsoft

Microsoft Studios

CENTRAL MEDIA

Film → Games

Halo 4 – 343 Studios/Microsoft

Microsoft Studios

CENTRAL MEDIA

Film → Games

Halo 4 – 343 Studios/Microsoft

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Film → Games

- Its not *just* technology improvements
- Staffing and specialization
- Pipeline/workflow changes
- Industry is maturing and learning (look at how long movie-making and Hollywood has been around)

Film → Games

Specialization – lighting ; ‘Agent under Fire’ (EA) - 2001

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Film → Games

Specialization – rigging ; ‘Tiger Woods PGA’ (EA Sports) - 2002

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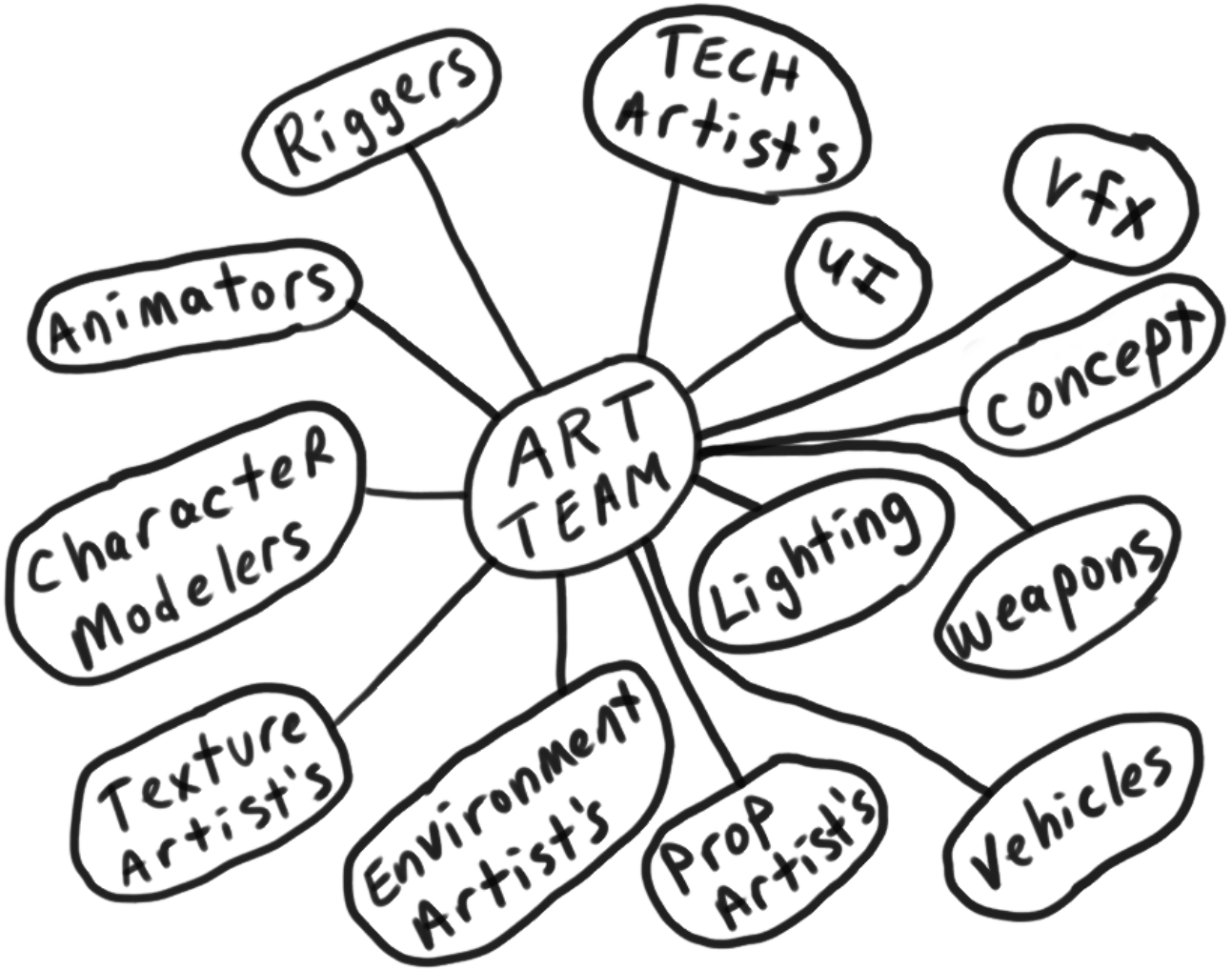
Film → Games

Games (art team)



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Film → Games

Film (art team)

- In addition to the previous slide for staffing:
  - Cloth sim teams
  - Hair sim teams
  - Storyboard team
  - Matte painting dept
  - Animation specialist's
  - VFX specialist's
  - Camera/layout dept
  - Face/muscle team
  - TD's for each dept
  - Lighting teams (per area)
  - CG supervisors/VFX supervisors
  - Art Direction team (Production Designer, etc)

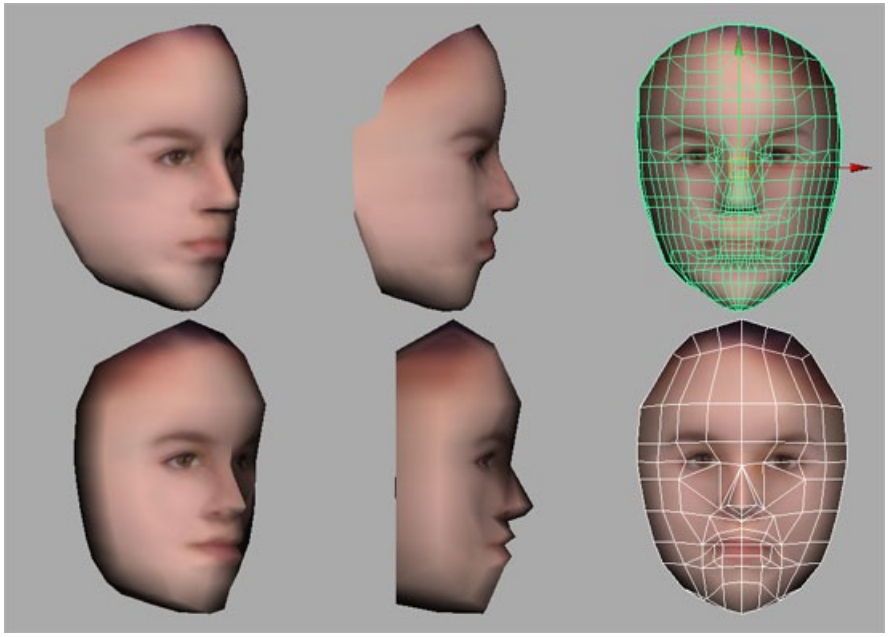
- Larger staff (larger cost, too)
- Specialization down to the minutia

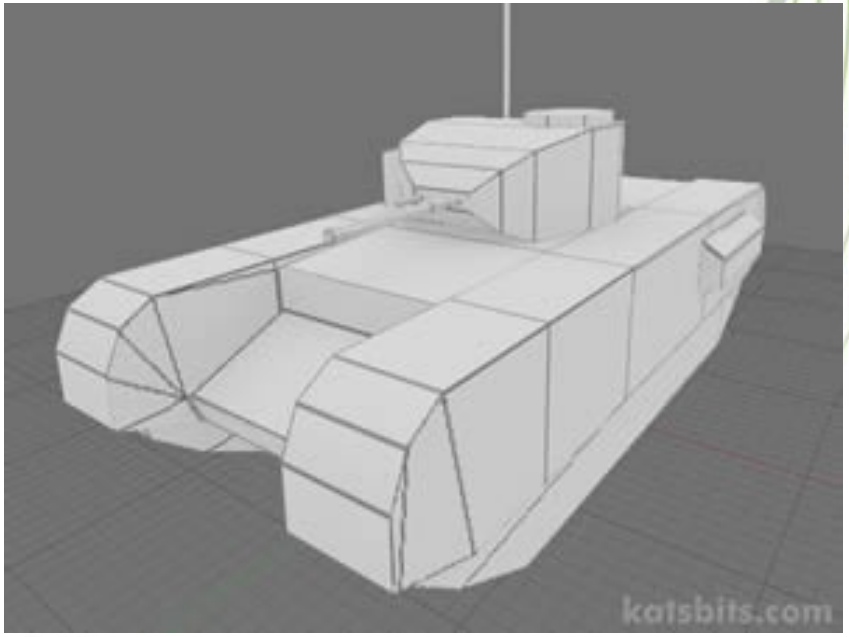
Film → Games

- Film Tricks & Techniques and pipelines/workflow are influencing how games are being created (examples to follow)
- More memory (RAM) for video games – higher texture resolution
- Budgets determine how much internal staff vs outsourcing (and what new tech can be researched and implemented)
- Practices such as calibration (having staff & tools) – and having this be mandatory
- Even Hollywood is now outsourcing to places around the world to reduce cost

Film → Games

Low poly models





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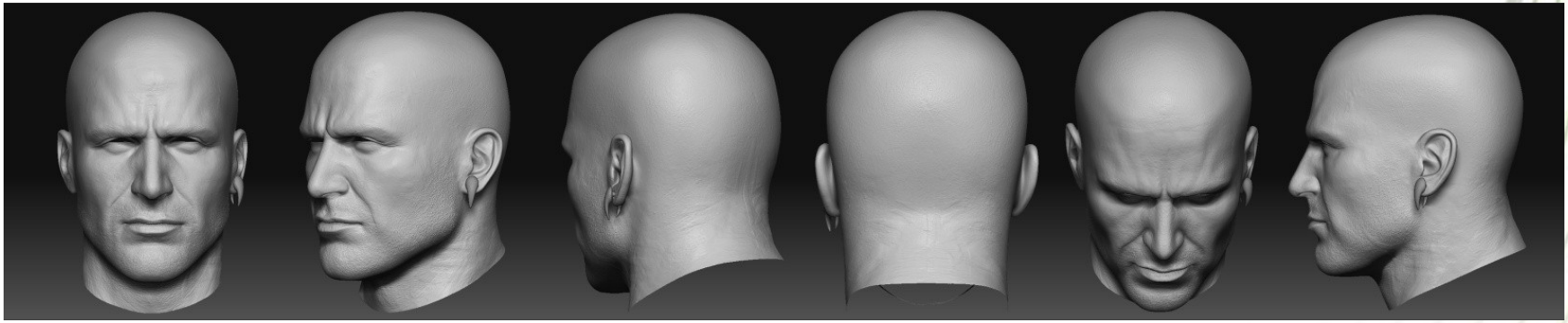
Film → Games

High resolution models



Film → Games

High resolution models

In-game model/screen shot; ‘Red Faction: Armageddon’ (Volition)

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Film → Games

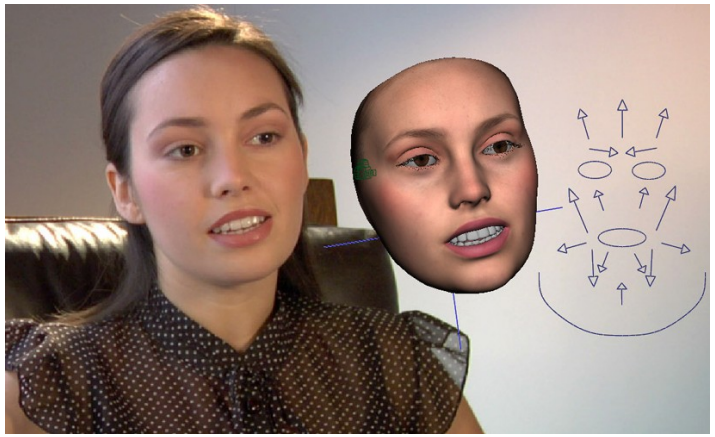
USC Institute for Creative Technologies

The ICT Graphics Laboratory develops new techniques for creating and displaying photo-real computer graphics of people, objects and environments. Research areas include image-based lighting and 3D displays. The lab's Light Stage systems for creating detailed digital doubles have been used in motion pictures, including Avatar, and honored with an Academy Award.

http://ict.usc.edu/research/

Film → Games

USC – ICT



*a collaboration between **Image Metrics and USC-ICT***

http://gl.ict.usc.edu/Research/DigitalEmily/

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Film → Games

Digital scanning / realistic results

- *USC-ICT/Paul Debevec's Light Stage tech*

- *Used by Digital Domain to create digital character in the movie, 'Benjamin Button'*

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Film → Games

HDR Imaging

High dynamic range imaging (**HDRI** or **HDR**) is a set of methods used in imaging and photography, to allow a greater dynamic range between the lightest and darkest areas of an image than current standard digital imaging methods or photographic methods.

Image credit (unknown)

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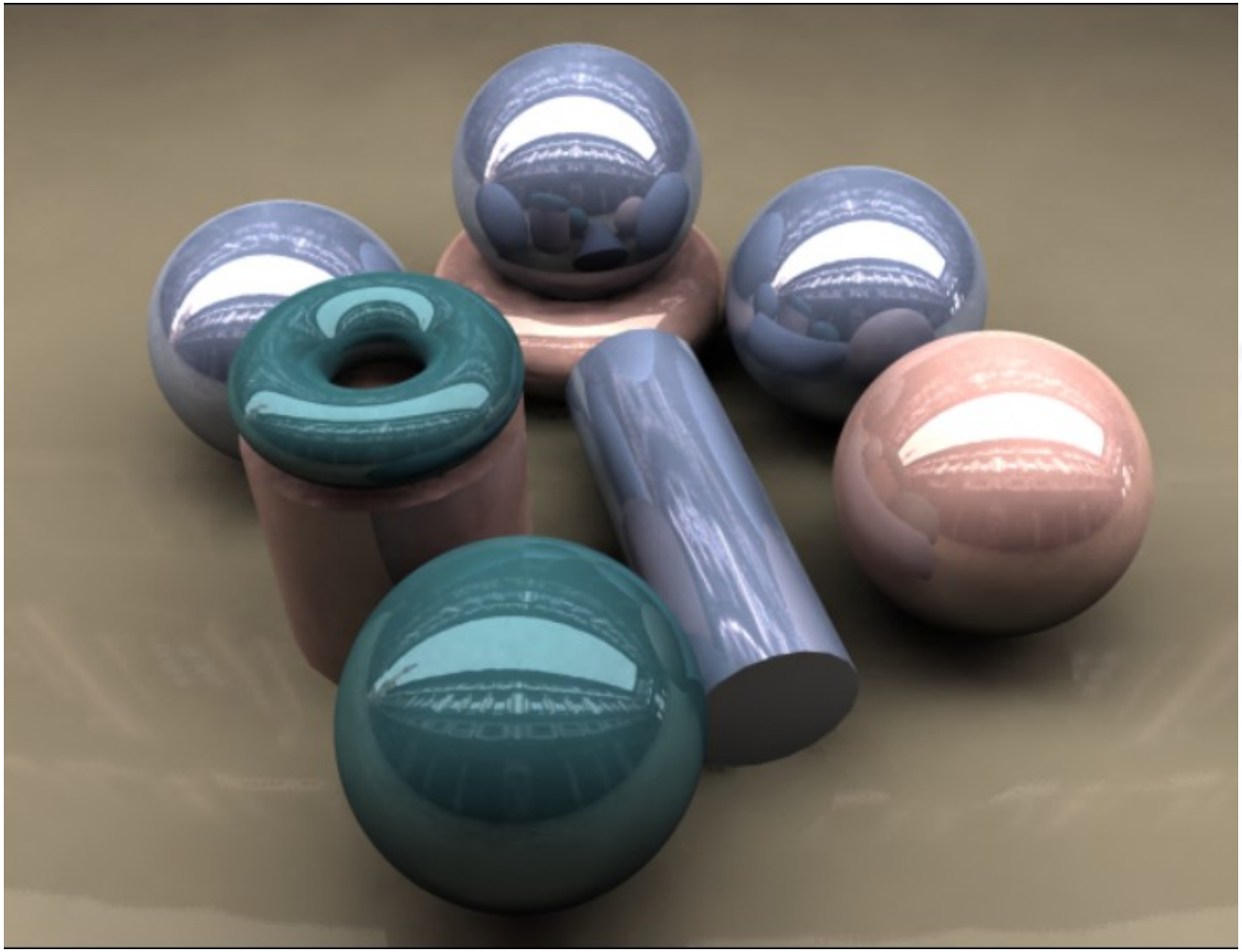
Film → Games

HDR Imaging



Rendered using an HDR probe - The Uffizi Gallery, Florence (USC-ICT)

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Film → Games

Rendering

Ambient Occlusion – Spiderman2 (Sony Imageworks)

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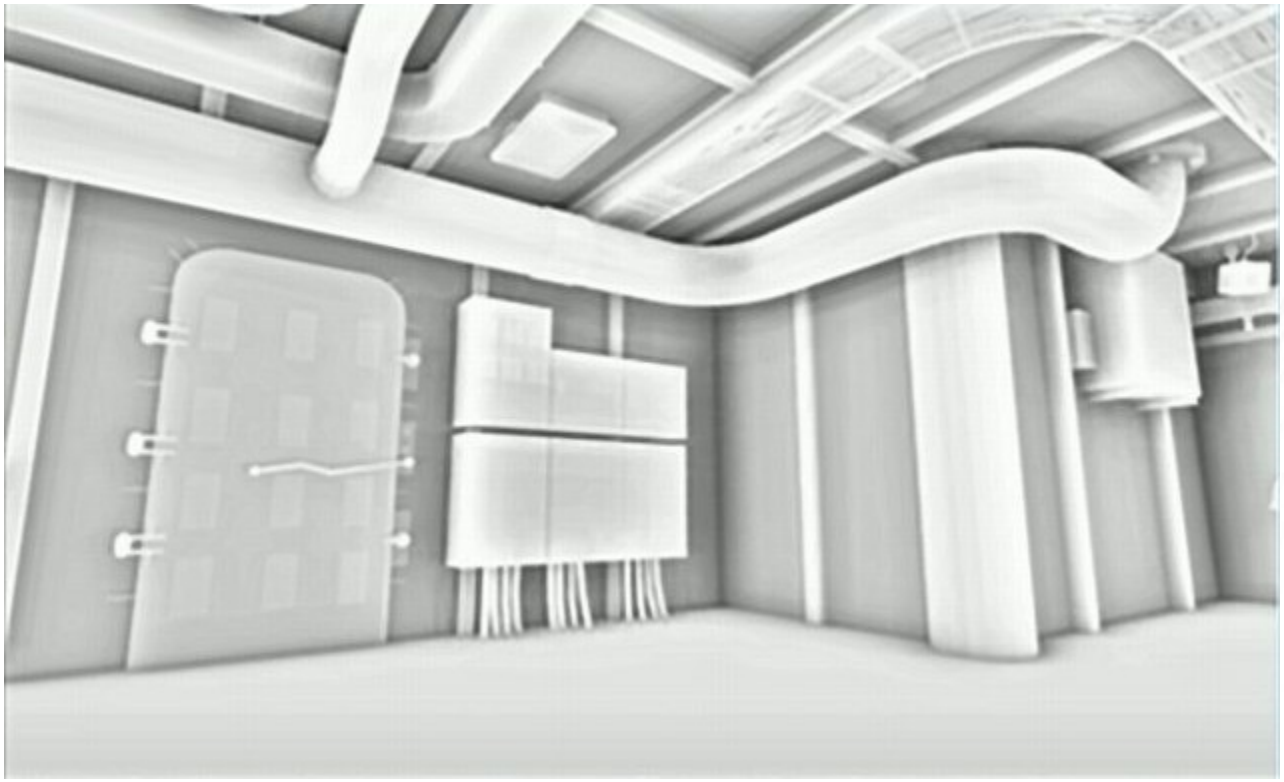
Film → Games

Rendering



Screen Space Ambient Occlusion – CryEngine3 (Crytek)

Screen space ambient occlusion (SSAO) is a rendering technique for efficiently approximating the well-known computer graphics ambient occlusion effect in real time. It was developed by Vladimir Kajalin while working at Crytek and was used for the first time in a video game in the 2007 Windows game *Crysis* made by Crytek.

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Film → Games

Rendering

Screen Space Ambient Occlusion – CryEngine3 (Crytek)

Film → Games

Rendering

Global Illumination (lighting/rendering)

Film → Games

Rendering

Deferred lighting/rendering with destruction (Red Faction: Armageddon – Volition)

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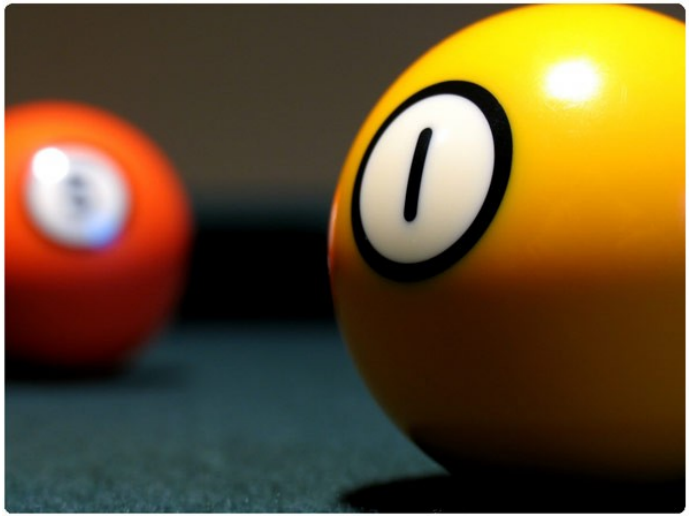
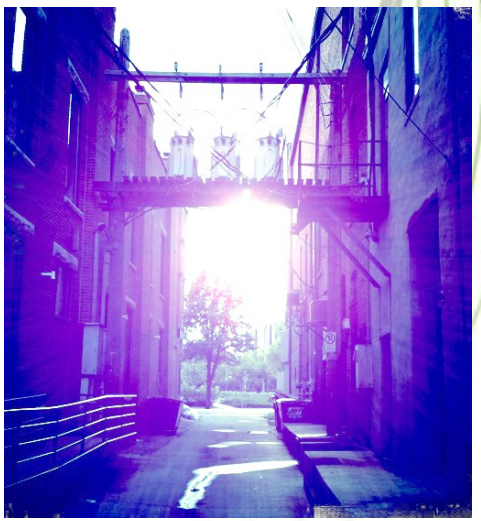
Film → Games

Cameras





- Cameras based on real lenses (distortion and imperfections)
- Depth of Field
- Bloom/Glare/Chromatic Aberration
- Motion blur
- Lens Dust
- Film grain

Film → Games

Cameras

Camera lens adjusts real-time to lighting conditions (Unreal Editor 4)

Film → Games

Cameras – DOF and motion blur

Madden 13 – EA Sports

Film → Games

Cameras - Anamorphic Lens effect

'Alien' (20th Century Fox)

'Crysis' (Crytek)

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Film → Games

Cameras / post-processing

Cross processing (sometimes abbreviated to **Xpro**) is the procedure of deliberately processing photographic film in a chemical solution intended for a different type of film.

→ **LUT's (Look Up Tables)**

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Film → Games

Believable characters

‘Lord of the Rings: The Two Towers’ (New Line Cinema)

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Film → Games

Believable characters

‘Shrek’ (PDI/Dreamworks)

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Film → Games

Believable characters

‘Lord of the Rings: The Two Towers’ (New Line Cinema)

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Film → Games

Believable characters

‘Avatar’ (20th Century Fox)

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Film → Games

Believable characters

'Avatar' (20th Century Fox)

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Film → Games

'LA Noire' (Rockstar Games)

Film → Games

'LA Noire' (Rockstar Games)

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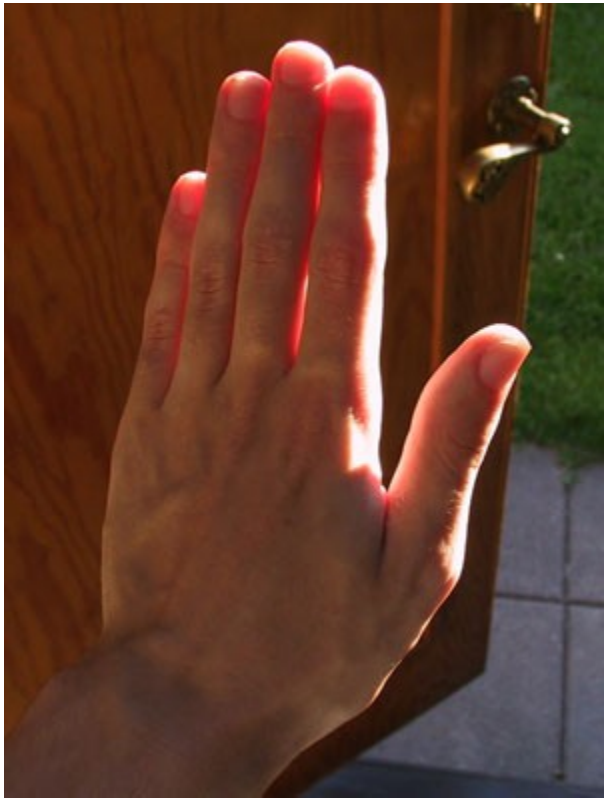
Film → Games

Sub surface scattering (SSS)



Photo

→

CG model/render

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Film → Games

Believable characters

Real-Time skin shader (nVidia)

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Film → Games

Believable characters

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Film → Games

Believable characters

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Film → Games

Believable characters

Uncharted 2: Among Thieves (Naughty Dog)

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The Uncanny Valley

The **uncanny valley** is a hypothesis in the field of robotics[1] and 3D computer animation,[2][3] which holds that when human replicas look and act almost, but not perfectly, like actual human beings, it causes a response of revulsion among human observers. The "valley" refers to the dip in a graph of the comfort level of humans as a function of a robot's human likeness.

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The Uncanny Valley

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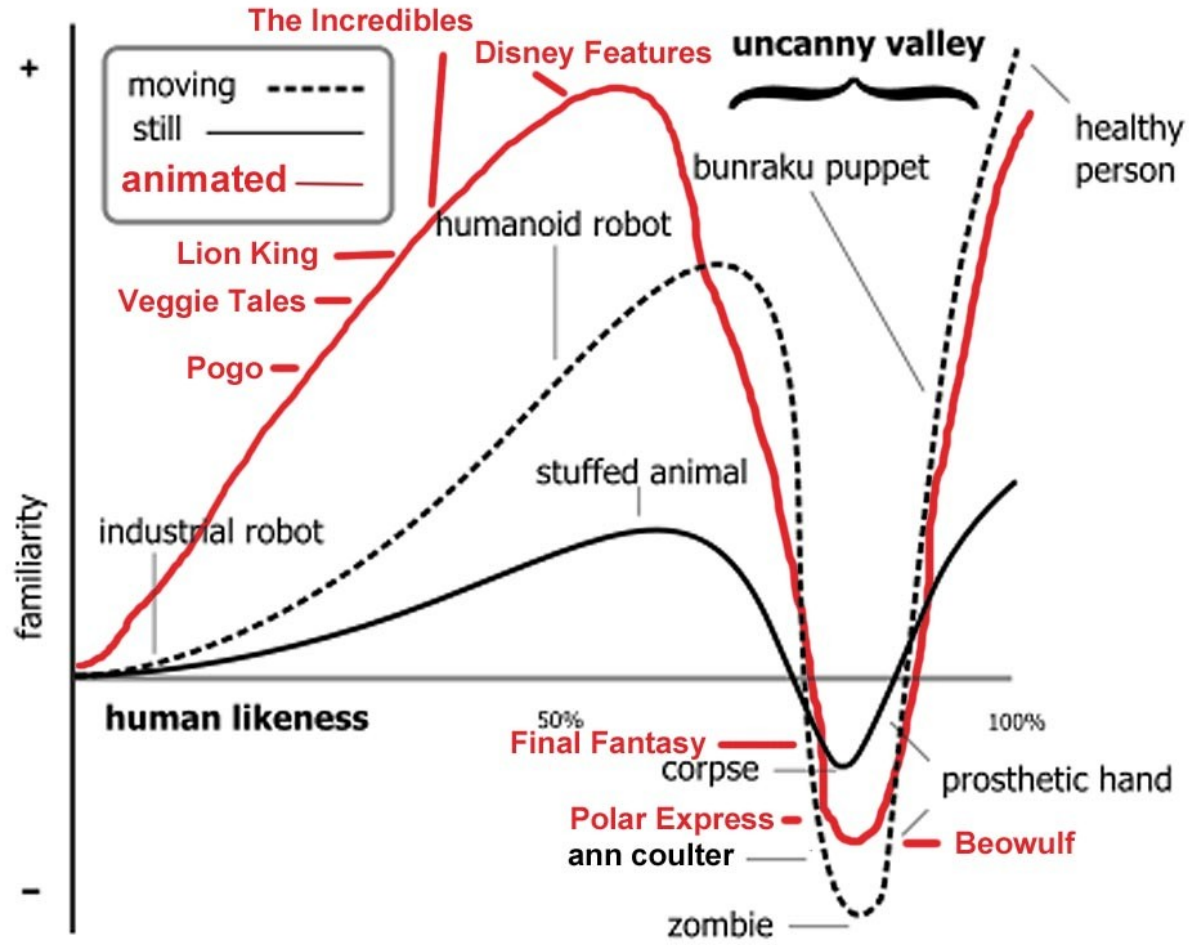
The Uncanny Valley



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(Not so) Believable characters

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(Not so) Believable characters

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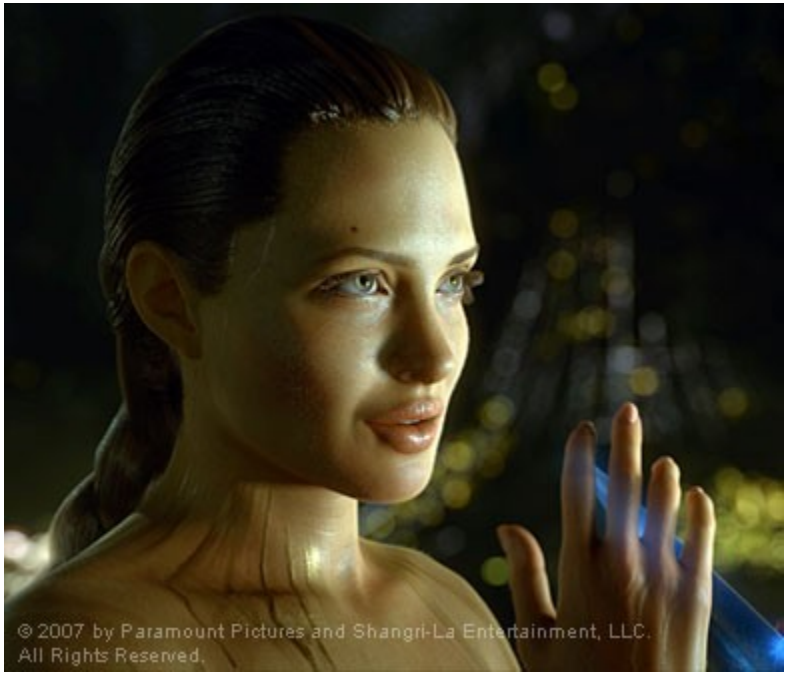
(Not so) Believable characters



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(Not so) Believable characters

‘LA Noire’ (Rockstar Games)

Film → Games

Environments

Battlefield 3 (Dice/EA)

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Film → Games

Environments

Battlefield 3 (Dice/EA)

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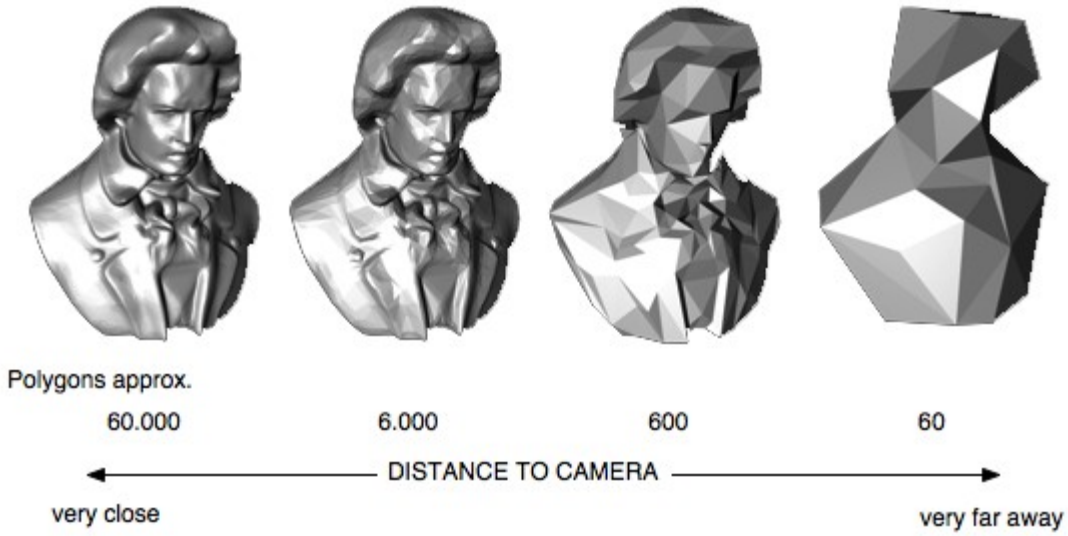
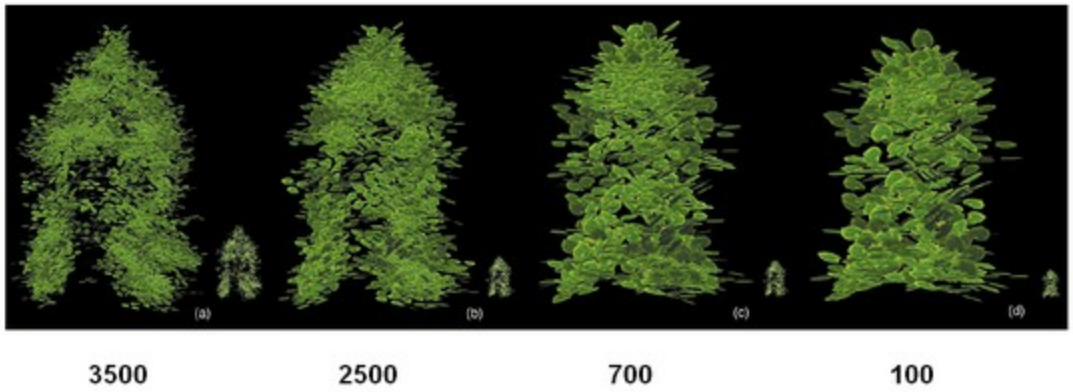
Film → Games

Creation better ‘immersion’ – LOD’s (level of detail)





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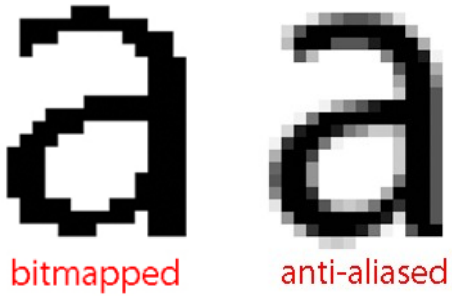
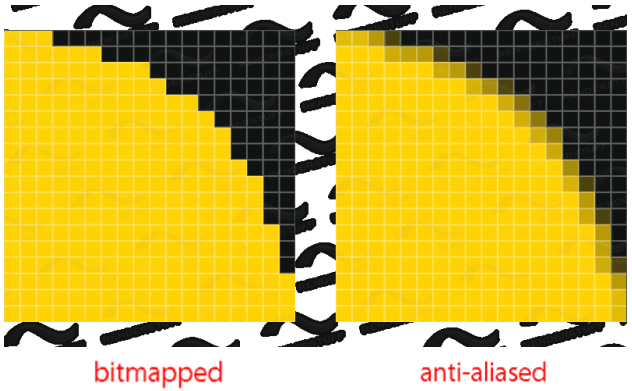
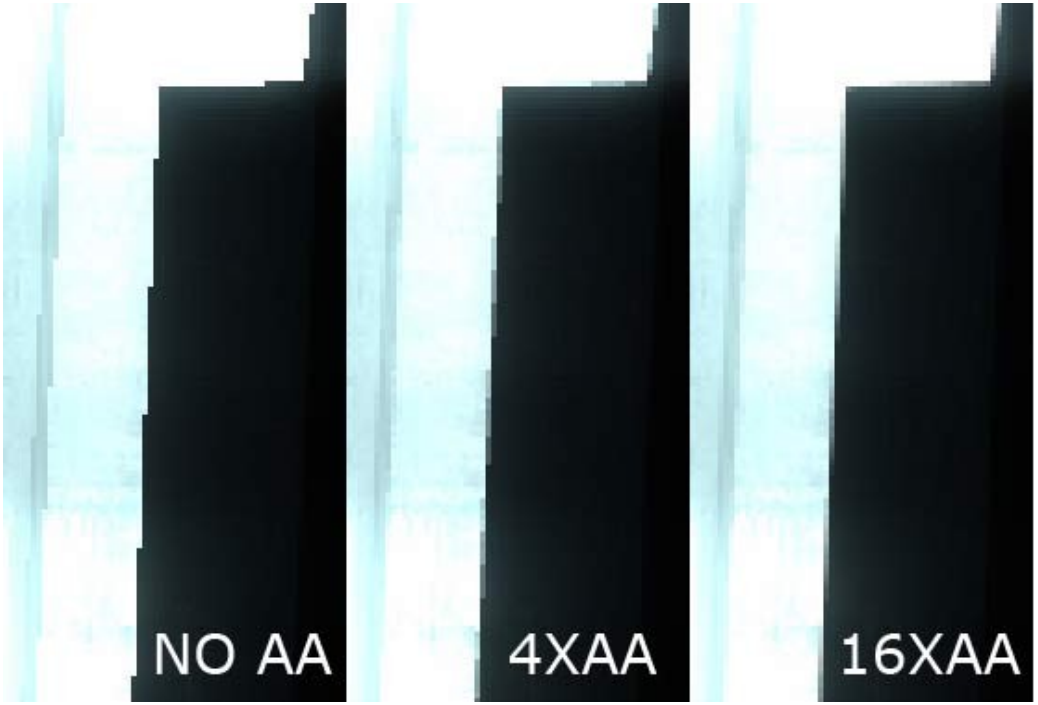
Film → Games

Creation better ‘immersion’ –> anti-aliasing







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Film → Games

Cinematics vs in-game

Saint's Row 3 (THQ/Volition)

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Film → Games

Cinematics vs in-game

Saint's Row 3 (THQ/Volition)

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Games → Film

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Games → Film

- Game techniques (normal maps, etc) are making their way back into films (to reduce render times and lower cpu memory)
- LOD's (level of detail models)
- Lightmap baking of shadows
- Real-time previews of assets
- Pre-visualization

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Games → Film

Real-time interaction = rapid iteration (and no surprises!)

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Games → Film

Real-time interaction = rapid iteration (and no surprises!)

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Games → Film

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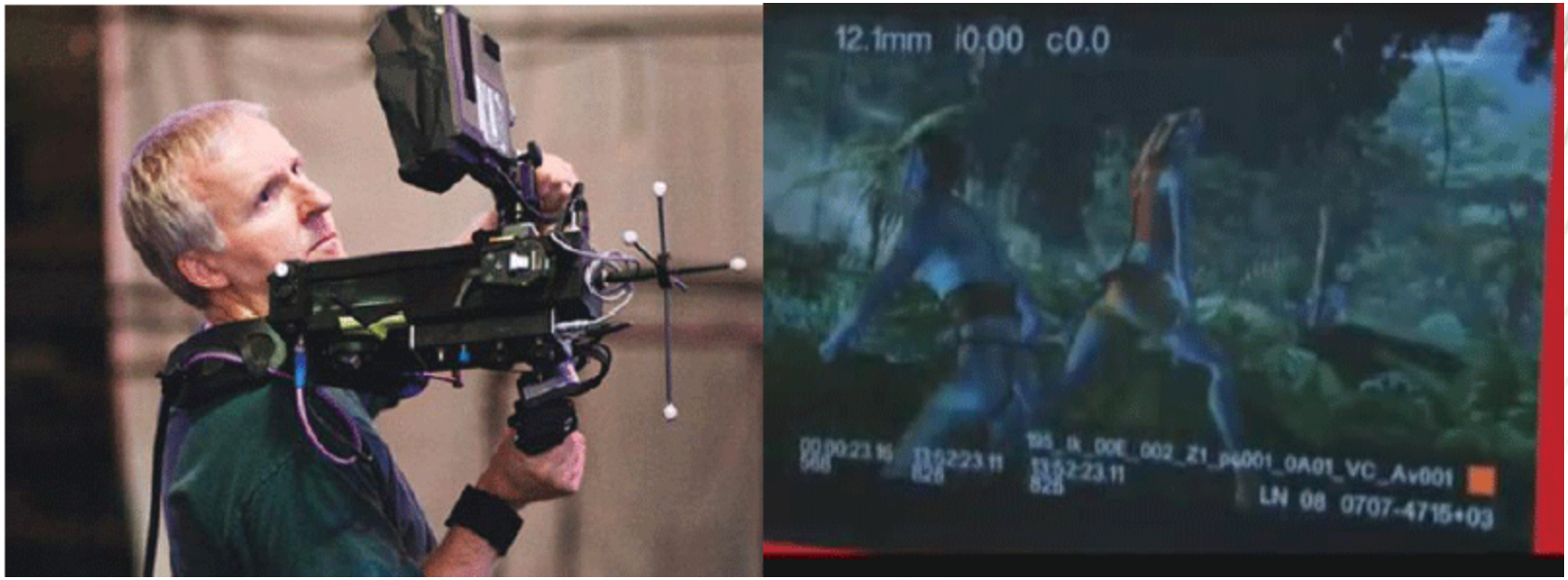

James Cameron – using a ‘virtual camera’ on the set of Avatar

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Games → Film

Real-time interaction = rapid iteration (and no surprises!)

ILM Goes Interactive with Previs – (Lucasfilms Ltd.)

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BONUS TOPIC!

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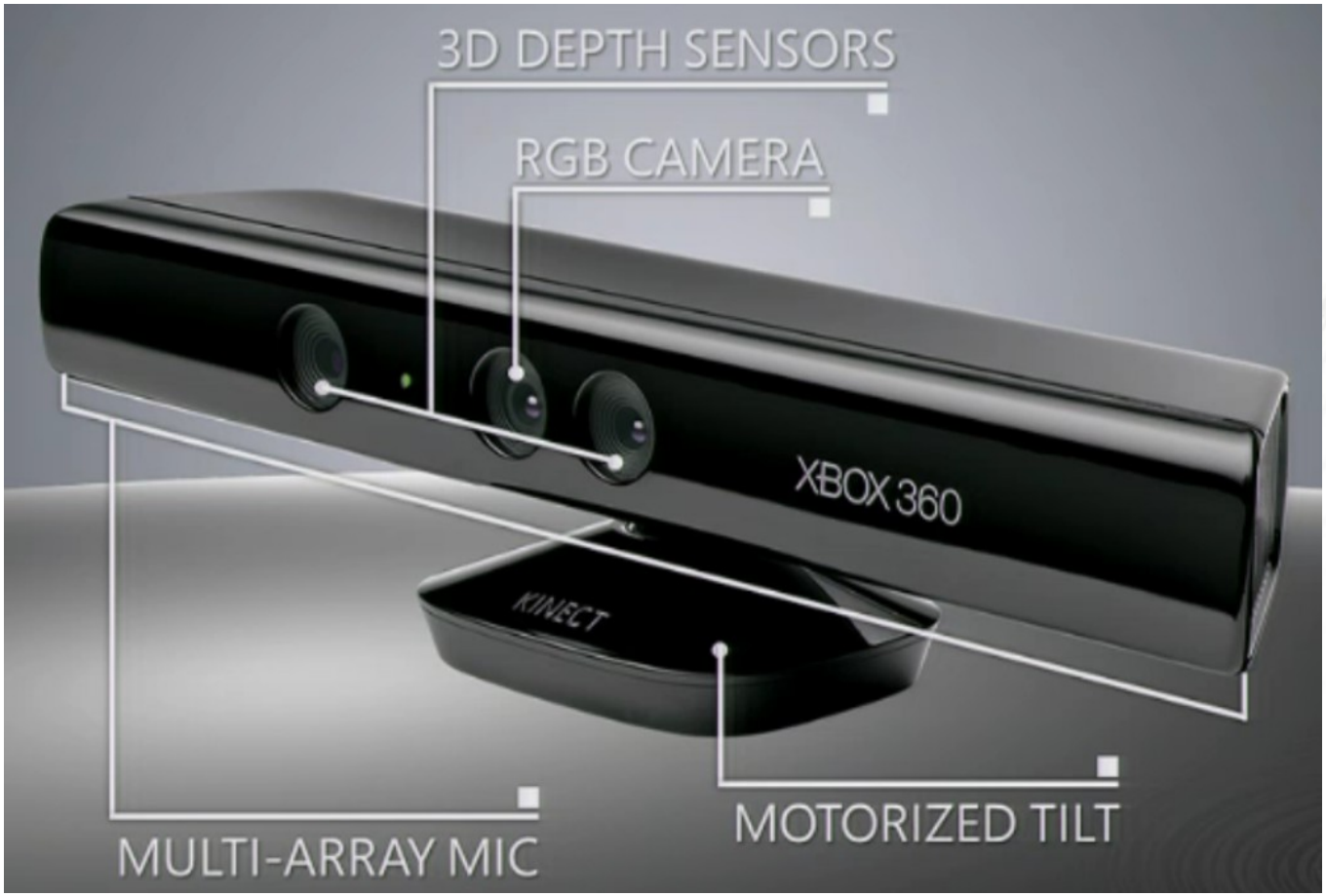
Microsoft Kinect



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Microsoft Kinect

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Microsoft Kinect

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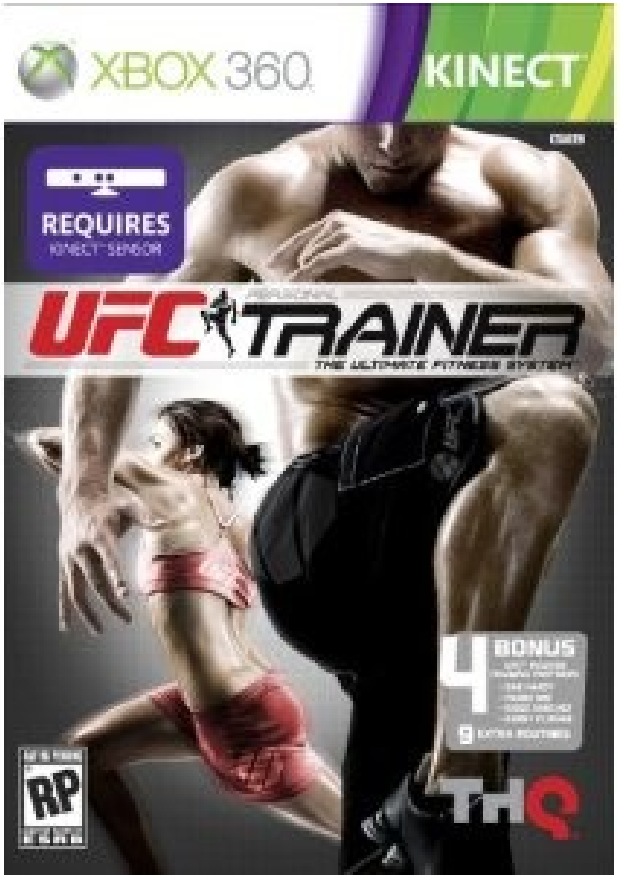
Microsoft Kinect



Microsoft Kinect

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Microsoft Kinect

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Microsoft Kinect – other uses

adafruit industries

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HOME → Blog

The Open Kinect project – THE OK PRIZE – get $3,000 bounty for Kinect for Xbox 360 open source drivers

Hi from team Adafruit, we're going to do our first ever "X prize" type project. Hack the Kinect for Xbox 360 and claim the ~~$2,000 bounty!~~ NOW $3,000

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Microsoft Kinect – other uses

CNET › News › Geek Gestalt ›

Bounty offered for open-source Kinect driver

by Daniel Terdiman | November 4, 2010 12:50 PM PDT

Follow

The first person or team to come up with an open-source driver for Kinect could win $1,000 from Adafruit Industries.
(Credit: Microsoft)

Update at 4:03 p.m. PT: This story has been modified with response from Microsoft.

The first person who figures out how to build an open-source driver for Microsoft's much-hyped new Kinect motion controller could win a $2,000 bounty offered by a leading open-source hardware developer.

Kinect, which launched today, is currently available solely for Microsoft's Xbox 360 and may well someday be extended to the Windows platform. But for New York-based Adafruit Industries, that's not enough.

And that's why Adafruit--led by MIT Media Lab alum Limor Fried and Make magazine Senior Editor Phillip Torrone--is offering two grand to someone who can figure out how to decouple the hot new device from Microsoft's gaming machine.

The bounty will go to the "first person or group to upload code and examples under an open-source license to (social-coding site) GitHub."

"Microsoft does not condone the modification of its products," a company spokesperson told CNET. "With Kinect, Microsoft built in numerous hardware and software safeguards designed to reduce the chances of product tampering. Microsoft will continue to make advances in these types of safeguards and work closely with law enforcement and product safety groups to keep Kinect tamper-resistant."

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Microsoft Kinect – other uses

Open source drivers to read Kinect data on a PC appeared within days after release

Microsoft Kinect – other uses

GAMING TECHNOLOGY

Boeing taps motion sensor power of Microsoft Kinect to sell 737s

Greg Lamm on Tuesday, August 2, 2011, 12:22pm PDT

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Aerospace | Kinect | Boeing | Microsoft | Diana Klug

Thanks to Microosft Kinect, Boeing doesn't have to lug around a real 737 to trade shows.

The commercial aircraft giant is using the software giant's technology to create a virtual tour of the next-generation Boeing 737 plane, using Kinect, Silverlight Deep Zoom, and Windows 7 Touch and Azure.

Digital marketing agency Wire Stone created Boeing 737 Explained.

Kinect interface for navigating scans during surgery (Sunnybrook)

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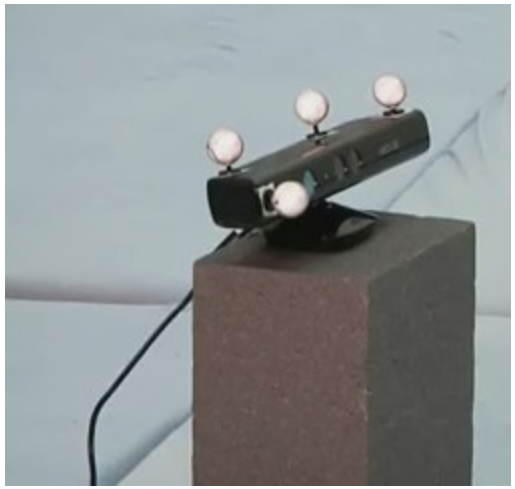
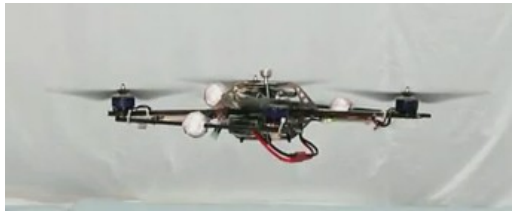
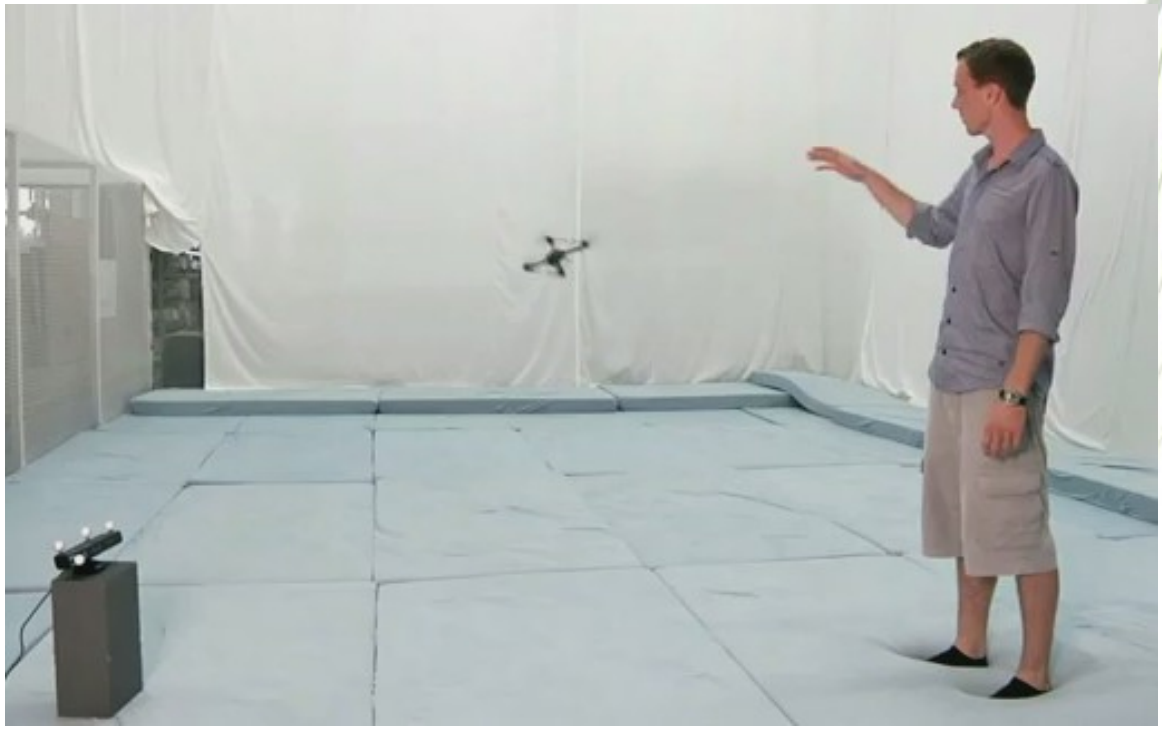
Microsoft Kinect – other uses







www.FlyingMachineArena.org

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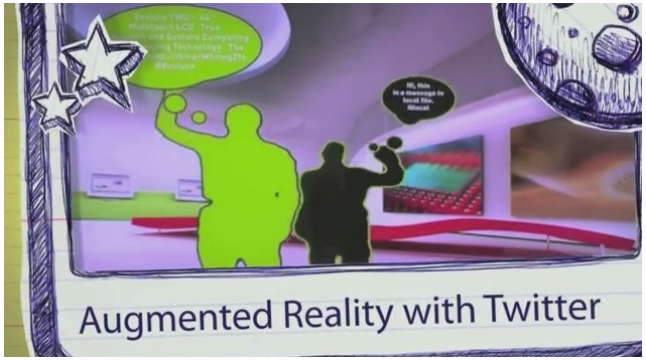
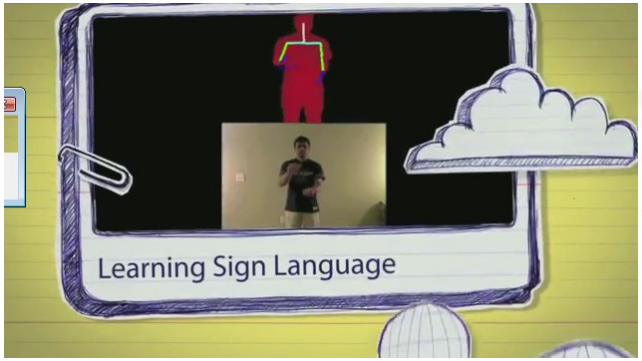
Microsoft Kinect – other uses





kinectEDucation.com

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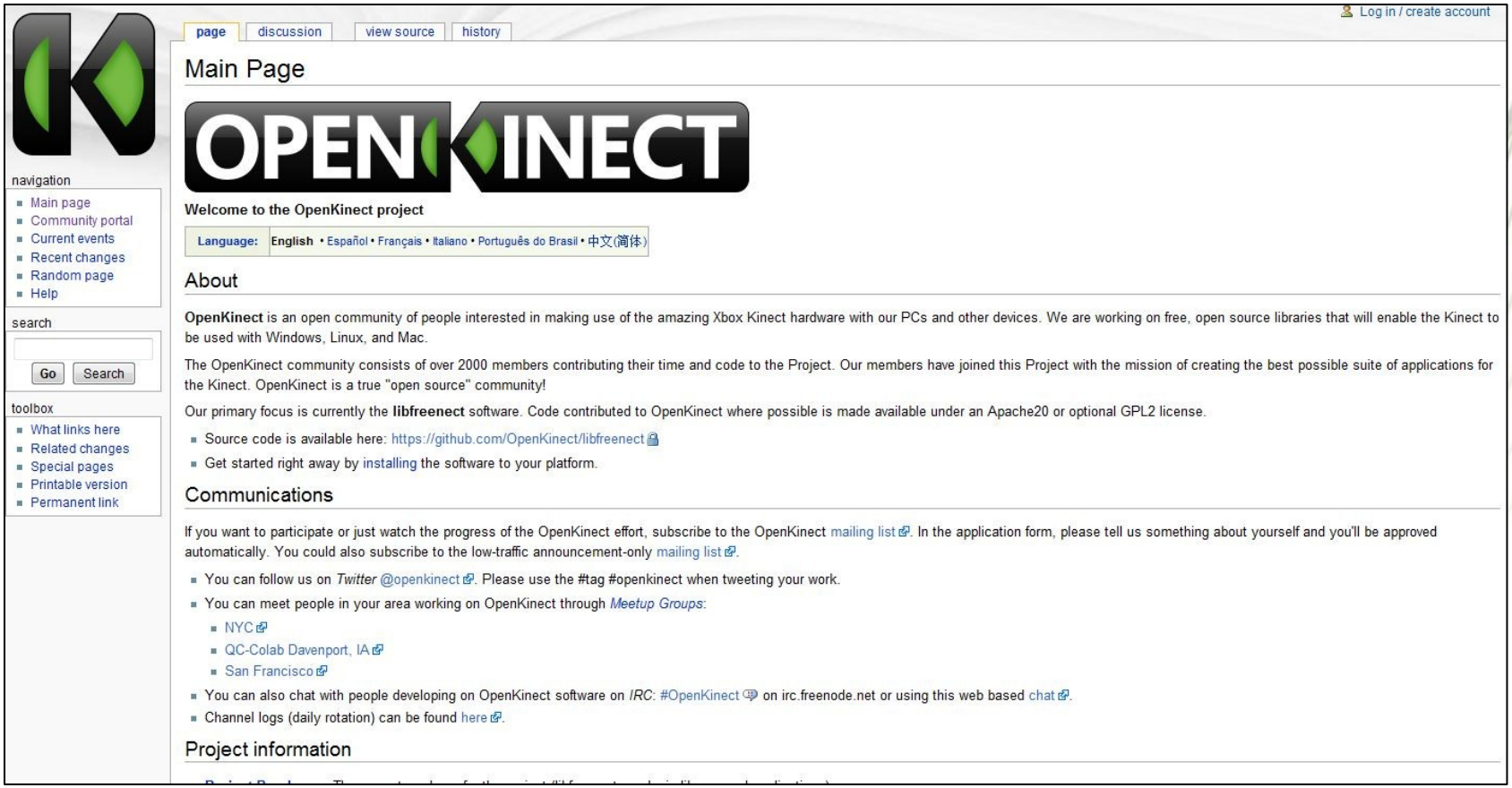
Microsoft Kinect – other uses



http://www.openkinect.org

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Microsoft Kinect – other uses

http://research.microsoft.com/en-us/um/redmond/projects/kinectsdk/

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Xbox Smart Glass

Announced at E3 (2012)

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Xbox Smart Glass

What is it??

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Xbox Smart Glass

- Exciting way to interact with content
- Uses existing devices
- Idea of existing apps talking – connecting devices and experiences
- Smart Glass is going to be a free product, launched before the end of this year

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Xbox Smart Glass

- your tablet can serve as a kind of secondary controller.

- You can call football plays in Madden, or set up multiplayer matches games like Halo 4.

- For casual gamers, a karaoke game will stream song lyrics directly to your tablet.

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Xbox Smart Glass

- You can even download all your goodies directly to your tablet, then stream them straight to your TV—no wires or DVR necessary.

- Microsoft is teaming up with Paramount, HBO, and other soon-to-be-announced partners to package additional SmartGlass content.

- Open SDK coming – exciting ways to innovate and create. Community is encouraged to invent, create and collaborate

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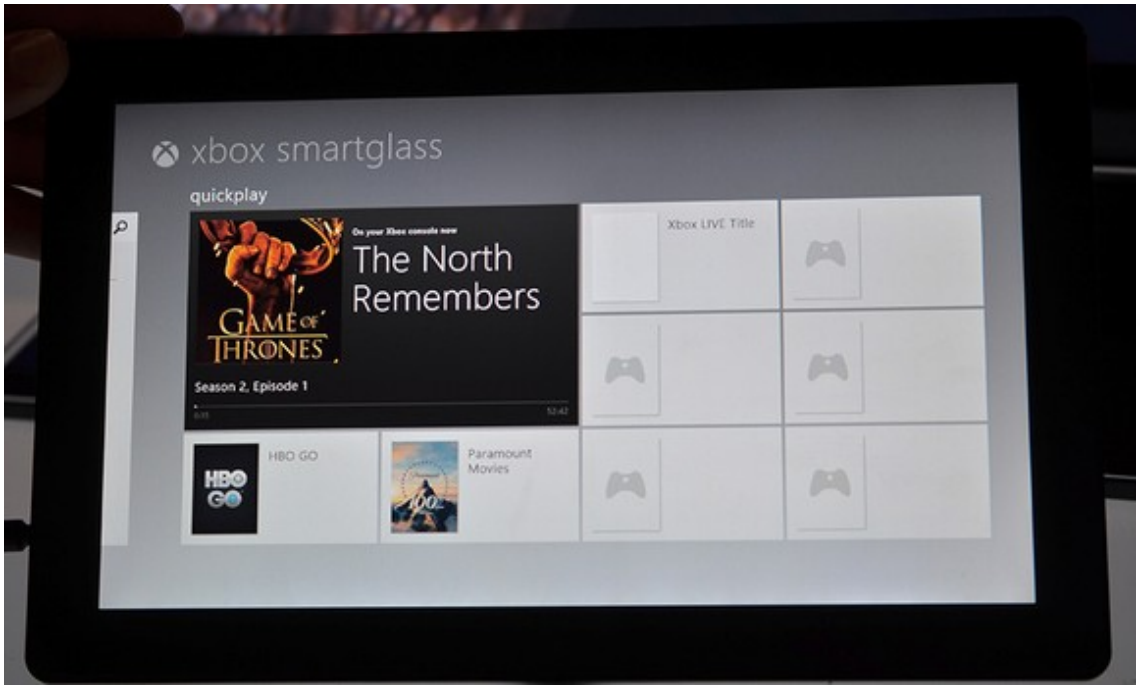
Xbox Smart Glass

Xbox Smart Glass



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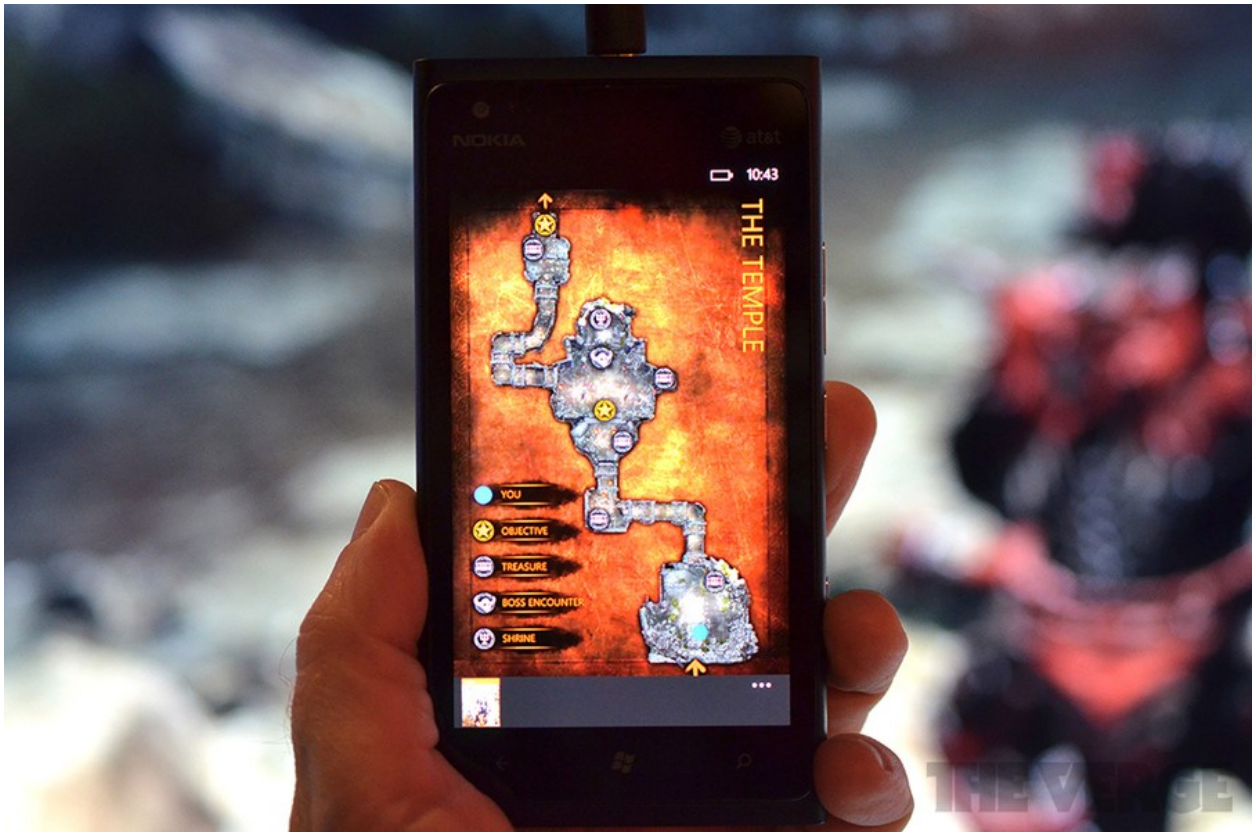
Xbox Smart Glass



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Xbox Smart Glass

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Questions?

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