
Physical Based Rendering الإظهار المجسم المبنى بشكل مادي

Rendering

bitmapped images

"

pixel

rendering

polygons

Ray tracing

tracing Ray

الحركة في الصور الثلاثية الأبعاد:

تحديد عدد اللقطات في الثانية:

Frames

/

/

Blurred

Shutter

()

Walk Through

x

x

x

x

خلق التشويش والشحوب Blurring

()

Spatial Anti- Motion Blur

. Alias

.Motion Blur



Mouse Pointer Trail

-

Ray

. Tracing

التحويل في الرسوم المتحركة ثلاثية الأبعاد:

:
 = x
 = y
 = z
 Sx
 Sy
 Sz
 ()
 D

$$\frac{sx}{d} = \frac{X}{Z}$$

$$sx = \frac{768 \cdot 75}{2} = \frac{768}{2/75}$$

$$sx = 288$$

$$\frac{sy}{d} = \frac{Y}{Z}$$

$$sy = \frac{1024 \cdot 75}{2} = \frac{1024}{2/75}$$

$$sy = 384$$

:
 !Error

$\omega = 22$ -- the _total field of view

$z_n = 1$ -- the point closest to us where we can no longer see into the imaginary world

$z_f = 30$ -- the point farthest from us where we can no longer see into the imaginary world

$$s = \sin\left(\frac{\omega}{2}\right)$$

$$s = 0.19$$

$$c = \cos\left(\frac{\omega}{2}\right)$$

$$c = .9816$$

$$Q = \frac{s}{1 - z_n/z_f}$$

$$Q = 0.1966$$

=

Sy

=

Sz

=

Z

x,y,z,1.5

:

x,y,z,w

$$X' = X \cdot c$$

$$X' = 753.8688$$

$$Y' = Y \cdot c$$

$$Y' = 1005.1584$$

$$W' = s \cdot c$$

$$W' = 0.1865$$

$$Z' = Q \cdot Z - Q \cdot z_n$$

$$= Q(Z - z_n)$$

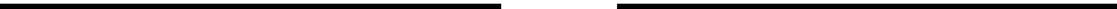
$$= \frac{s}{1 - z_n/z_f} (Z - z_n)$$

$$= s \cdot z_f \frac{(Z - z_n)}{z_f - z_n}$$

$$Z' = .1966$$

Walk through

دور البطاقات الجرافيكية :Graphic Cards



Rendering

TNT 2 Voodoo 3

GeForce 256

Nvidia

Ray ()
) Floating Point

Tracing

.(

3DFX

VooDoo 5

. T-Buffer

CPU

Aliasing

T-Buffer

()

Depth of field

Motion Blur

.Shadows

VooDoo 5

تطبيقات الرسوم ثلاثية الأبعاد

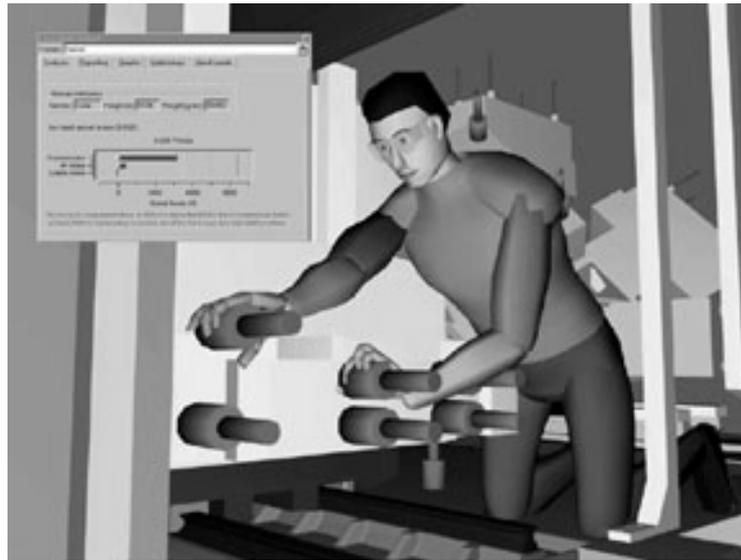
. The Wrath of Khan and Tron – Star Trek
Toy

Story

(CAM / CAD)

:

Task Analysis



Task Analysis

CNC

Robots

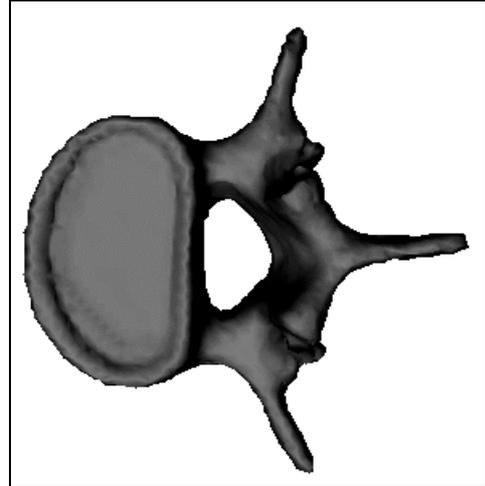
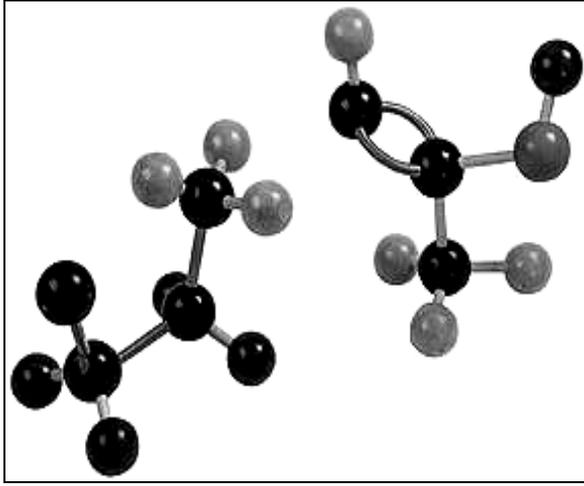
.(-)



Computer Generated



(-) Jurassic Park



Chemical Processes



Real-time

Rending

Rendering

أنواع الرسوم ثلاثية الأبعاد:

١- ستيريو جراف Stereographs

stereoscope

stereo camera

stereographs

stereo cameras

Seton Rochwit

stereo realist

,view finding

(-)

٢- الانا جلايف anaglyphs

anaglyphs

()

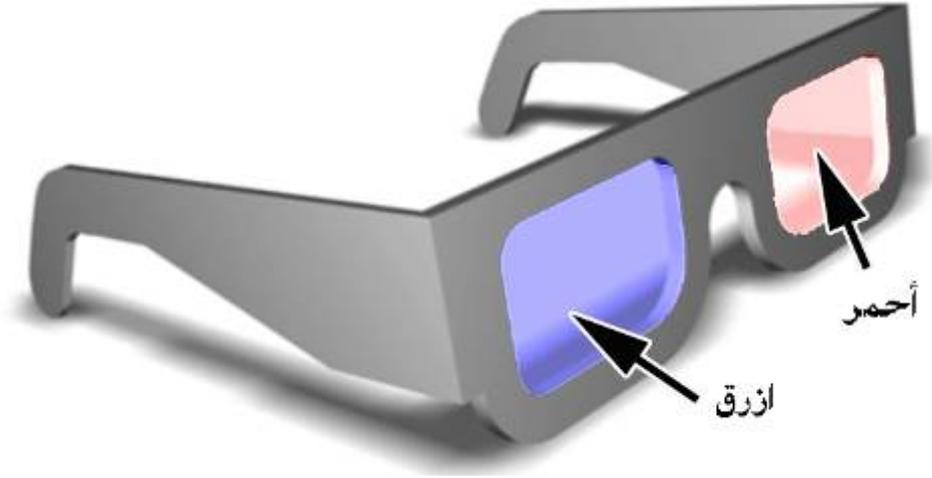
()

()

(Louis Ducos Du Hauron

)

(Louis and Auguste Lumiere



3- الصور المستقطبة ثلاثية الأبعاد Polarized 3D images

(Edwin Herbert)

()

(Polaroid)

Simultaneously

Projector

Projector

4- أوتوستيريوجرام Autostereograms

5- الصور العدسية Lenticular Images

()

٦- الاستيريوجرام ذى النقاط العشوائية Single Image Random Dot Stereograms (SIRDS)

SIRDS

SIRDS

٧- الهولوجرام Holograms

()

Credit Cards

(Hologram)



(Integrals)

"Stereoscopy"

()

..

Rotating "

" Stage

:

()

Computer-Generated Holograms

" Prototype"

أسئلة للمراجعة:

Rendering

Ray Tracing

		.
		.
		.
	Z-Buffer	.
Depth of Field		.
	AntiAlias	.
		.
		.
Linear Representation		.
	Wireframe Models	.
	Surface Models	.
		.
		.
	3D Model Modification	.
		.
	Transformation	.
		.
Bump map	Texture Map	.
		.
	Surfacing	.
	Rendering	.
		.

Bluring .

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T-Buffer .

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Polarized 3D images - anaglyphs - Stereographs

Hologram .