

Introduction to Computer Animation

Module Coordinator: John McQuillan

E-mail: john.mcquillan@uws.ac.uk

Lecture 5

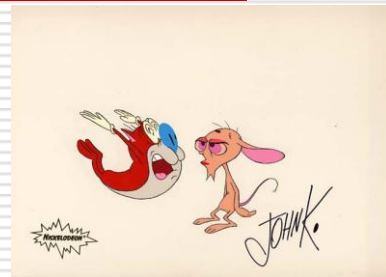
History 80's-90's Onwards

1980's

- Started with:
 - Heavy Metal, Tron
- Ended with:
 - Akira, Who Framed Roger Rabbit, The Simpsons
- Important events:
 - Founding of PIXAR
 - John Lasseter – Tin Toy



John Kricfalusi – Ren & Stimpy



History 80's-90's Onwards

- 1990's Onwards
 - Terminator 2
 - Jurassic Park
 - Toy Story
 - The rise of Anime
 - Beavis & Butt-head
 - Matt Stone & Trey Parker
 - South Park
 - Aardman – Nick Park
 - Wallace & Gromit
 - Craig McCracken
 - Powerpuff Girls
 - Genndy Tartakovsky
 - Samurai Jack
 - Doom and Tomb Raider
 - Interactive 3D becomes feasible on home computers
 - Shrek

Craig McCracken - Powerpuff Girls



Genndy Tartakovsky - Samurai Jack



PIXAR – Toy Story



The need for a story!



More History...

Computer Graphics

What are Computer Graphics?

- ❑ On screen, or printed, representation of data by a computer (usually data that lends itself to graphical interpretation)
 - ❑ Linked to hardware
 - ❑ Used for illustration, art work, scientific or architectural visualisation
-

Prehistory

- ❑ Various mathematical research of later consequence to computing and computer graphics was carried out in the early 1900's and earlier
 - ❑ Important research done in the 1930's on light and 'Radiosity', how light from one surface affects another
-

History

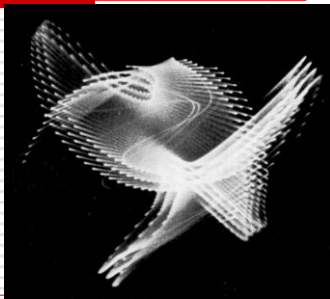
- Earliest developments in the late 1950's/early 1960's
- Earliest developments were for military Early Warning and Command and Control projects
 - SAGE and Whirlwind
- Some early artistic works were being created using oscilloscopes

Key players

- | | |
|--|--------------------|
| □ Programmers, Computer Scientists & Engineers | □ Artists |
| ■ Ivan Sutherland | ■ John Whitney Sr. |
| ■ James Blinn | ■ Ben Laposkey |
| ■ Edwin Catmull | ■ John Lasseter |

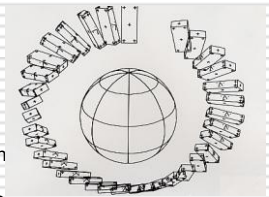
1950

- **Ben Laposky**
 - *Oscillation Number Four - Electronic Abstraction*
 - Photograph
 - Oscilloscope



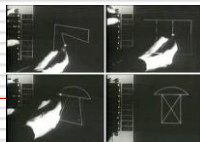
1960's

- **Edward E. Zajac**
 - Simulation of a Two-Gyro, Gravity Gradient Attitude Control System
 - Hardware: IBM 7094 computer, Stromberg-Carlson 4020 microfilm recorder. Software by the artist



Sketchpad

- Ivan Sutherland
 - 1963
 - Lightpen and CRT screen based on a converted batch processing computer
 - Regarded as the real birth of CAD and interactive computer graphics
 - Provided some of the inspiration for the development of the mouse



Late 60's

- Jack Bresenham
 - Developed techniques for display of graphical information on raster devices
- Mouse invented
- Lots of important algorithms and software developed

The Mouse and the GUI

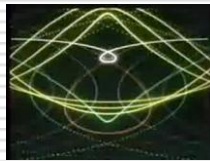
- ❑ Invented by Doug Engelbart
- ❑ The development of computer graphics – especially for average users, has been tied to the development of the GUI and the mouse
- ❑ The Graphical User Interface
 - Early 1970's at Xerox Parc, California
 - Relied on developments in Computer Graphics

1970's

- ❑ Early 70's
 - 3D
 - ❑ Shading algorithms developed by Gouraud and Phong at the University of Utah. Phong also developed a model for reflection
- ❑ Mid-Late 70's
 - Turner Whitted – developed ray-tracing for improved realism in shadows and reflection
 - Home computers started to become popular

1975

- ❑ John Whitney
 - ❑ A pioneer of computer generated art and film, working from the 1950's up through the 1980's
 - Arabesque
 - ❑ Timed computer graphics to a musical sound track



Early 1980's

- ❑ Improvements in home computers led to development of graphical applications
- ❑ GUI popularised by Apple
- ❑ Home computers started to use the mouse

Mid-late 1980's

- ❑ Jim Blinn
 - Develops soft modelling techniques and texture mapping
- ❑ Pixar founded by Steve Jobs, John Lasseter employed Ed Catmull (they're now all in charge of Disney-Pixar)
- ❑ Home computers such as the Atari ST and the Amiga made 2D and primitive 3D viable in games

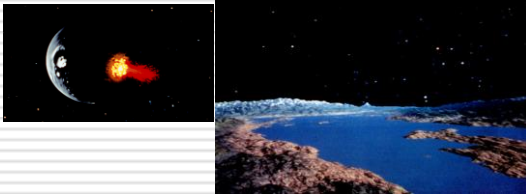
1985

- ❑ Young Sherlock Holmes and the Pyramid of Fear
- ❑ SFX by ILM



Other important films of the 80's

- ❑ Star Trek II: The Wrath of Khan
 - Genesis Effect



More Films

- ❑ Tron
- ❑ The Last Starfighter
- ❑ The Adventures of André and Wally B.
 - John Lasseter – just before Pixar



1990's

- ❑ Big improvements throughout the 90's in graphics hardware for home computers and games consoles
 - 3DFX card
 - Nvidia and ATI
- ❑ Research into photorealistic rendering and image-based lighting/rendering

Notable Films of the early 90's

- ❑ Total Recall
 - Skeletal characters moving behind an X-ray machine
- ❑ Beauty and the Beast
 - 3D backgrounds
- ❑ Terminator 2
 - Took reflection mapping and just about everything else to the limit
- ❑ Lawnmower man
 - Used early motion capture and surreal VR sequences

Today...

- ❑ CGI is taken for granted
- ❑ Expected to be of high quality
- ❑ When it's good it's not noticed
 - Just like animation

Today's Lab

- ❑ Work on assessment 1