Introduction to Computer Animation

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Lecture 1

Timetable

Week	lecture	Lab
1	Introduction to the course and a brief history of animation and animation terminology	Introduction to vector drawing and simple 2D animation
2	2D drawing and animation techniques	More complex animation
3	More on animation techniques	Even more complex animation, morphs, easing
4	Image file formats and animation for the Web	And yet more flash
5	Computer Graphics	Assessment – 2D
6	3D animation history and terminology, applications	Introduction to 3D working within the 3D environment.
7	3D modelling - coordinate systems and transformations	Basic 3D modelling
8	3D Modelling techniques	More modelling with surface texturing, more advanced introduction to Layout and how to arrange objects in a scene. Boolean operations.
9	3D Modelling techniques - surfaces and texturing	ntroduction to animation and rendering in the 3D environment within layout
10	3D animation techniques - 3D transformations, cameras and lighting	More advanced animation with lights and cameras.
11	Lecture assessment. – multi-choice	Model making assessment
12	Assessment – 3D Animation	Assessment – 3D Animation

Timetable (part 2)

- First half – 2D
  - Vector drawing and animation program
  - Frame-by-frame animation
  - Keyframing, Tweening and Layers
- Second half – 3D
  - Modelling
  - Texturing
  - Animation

Assessment

- 100% continuous assessment
  - Assessment 1
    - Weeks 4-5 – 2D (Flash) animation
  - Assessment 2
    - Written assessment, multi-choice, 1 hour, based on lecture material
  - Assessment 3
    - Week 10 (submitted in week 12), 3D modelling assessment
  - Assessment 4
    - Week 12, 3D animation assessment, done in the lab

Aims

- Teach you about animation!
  - History & development
  - Basic principles
  - Terminology
  - Techniques of computer animation
    - 2D & 3D
- Familiarise you with tools used to create animation on the computer

ATTENDANCE

- Attendance regulations
  - All students must attend all lectures and labs
  - A register will be called – or available for signing, either during the lecture or at the start of each lab
  - It is the students responsibility to ensure that the register is signed

Failure to attend

- Failure to attend may result in the withdrawal of the student from the module
- For students studying on an educational visa – if you miss more than two weeks of your course without notification you may have your visa revoked

Student Attendance responsibilities

- Students must sign the register in each of their module classes (details will be made available by module lecturers)
- Students must inform the school office if they will be absent for a week or more
- On return from a period of absence, students should fill in a self-certification form (available from the student office) detailing the reason for their absence and presenting any medical evidence

Assessment Regulation

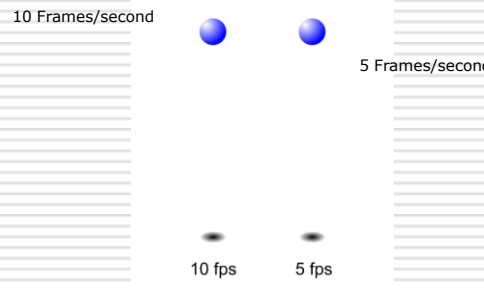
- Students MUST submit coursework
- A mark of zero for a module, irrespective of attendance, will reuslt in withdrawal from the module
  - This means you'll need to completely re-attend the module in the following year

ANIMATION

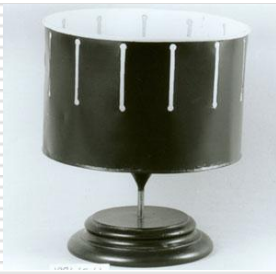
Animation?

- Illusion of Life
- Persistence of Vision
  - 1820 – Peter Mark Roget
  - Eye (retina)/image retention = 1/10 second
  - An image remains imprinted on the retina for a tenth of a second

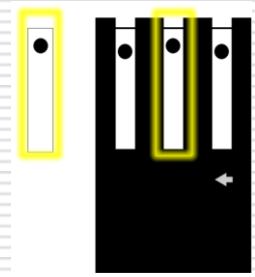
Persistence of Vision

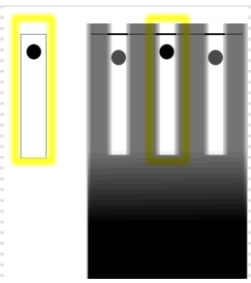


Zoetrope



- William Horner
  - 1834





Praxinoscope

- Charles Reynaud, 1877

Other Devices

- Thaumatrope
  - John Ayrton Paris, 1825
- Phenakistoscope
  - Joseph Plateau, 1832
- Kinora
  - Louis and Auguste Lumiere, 1912

Phenakistoscope

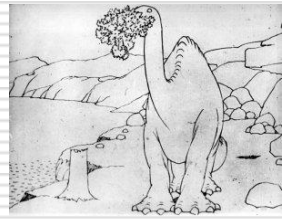
1900's-1920's

- 1900's
  - Several pioneering films by the Thomas Edison company
- 1902
  - A trip to the Moon
    - George Méliès
- 1914
  - Gertie the Dinosaur
    - Winsor McCay
- 1915
  - Krazy Kat
    - Gregory La Cava

George Méliès – A Trip to the Moon

Winsor McCay

- Newspaper cartoonist
- Creator of *Gertie the Dinosaur* in 1914
- First animated Documentary: *The Sinking of the Lusitania*
- Disliked lack of true artistry in animation



The First Animation Studios

- Raoul Barre
  - 1913
- John Bray
  - John Bray Studio, 1914
  - Developed (further developed?) Cel animation using celluloid sheets for drawings (Earl Hurd)

Krazy Kat - 1916

Gertie the Dinosaur - 1921

Disney

- Early 1920's
  - Alice's Wonderland
  - Mixed live action with animation
- Steam Boat Willie, 1928, introduces Mickey Mouse to the World
- Develops 'hyper realist' style

First Animated Feature

?

Quirino Cristiani - Argentina

- *El Apóstol* (1917)
  - Quirino Cristiani - Argentina
  - 1917
- Die Abenteuer Des Prinzen Achmed
  - "The Adventures of Prince Achmed"
  - Lotte Reiniger - Germany
  - 90 minute feature
  - 1926
- Snow White and the Seven Dwarfs
  - Christmas, 1937
  - Huge success,
    - Most people think it was the first animated feature!

1930's onwards

- Disney dominates
  - Period of great innovation
  - Multi-plane camera setup
  - Revolution in cel and ink and 'production lining' of the animation process

Multiplane Camera

- "The Old Mill", 1937

Today

- Basic principles still the same
- Frame-by-frame – one image being replaced by another in rapid succession

Animation Techniques

- Cel animation
- 24 frames/sec = 1440 frames/min
- Keyframes
- 'Inbetweening' (tweening)
- Inks

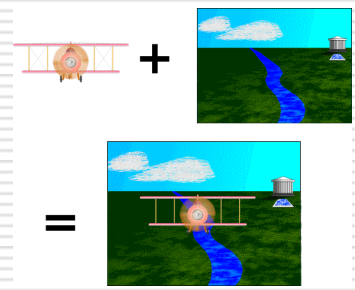
Terminology

- Keyframes
- Tweening
- Inbetweening
- Cel

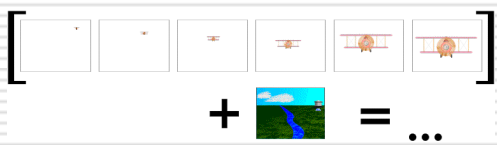
Cel

- Acetate sheet (originally)
- Cuts down dramatically on the amount of drawing
- Allows backgrounds to be reused

Cel 2



Cel 3



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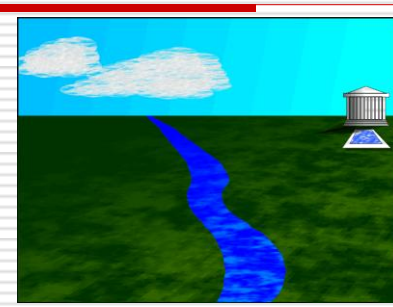
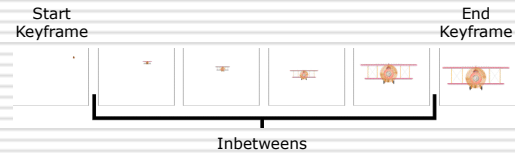


Keyframes & Inbetweens

- Keyframes
  - Define key points (frames) at the start and end of an action
  - Created by senior animators/artists
- Inbetweens
  - Frames in between the keyframes
  - Process (more commonly) called "tweening"
  - Carried out by junior animators
- Important innovation – allows 'production lining' of the animation process

Keyframes & Inbetweening



Books

- No set text – too expensive!
- …but, some good books on the subject are:
  - Principles of Three-Dimensional Computer Animation
    - Michael O'Rourke
  - The Animators Survival Kit
    - Richard Williams

Lab 1

- Introduction to vector drawing frame-by-frame animation using Adobe Flash
- Next week
  - Keyframing, tweening and easing