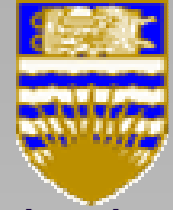


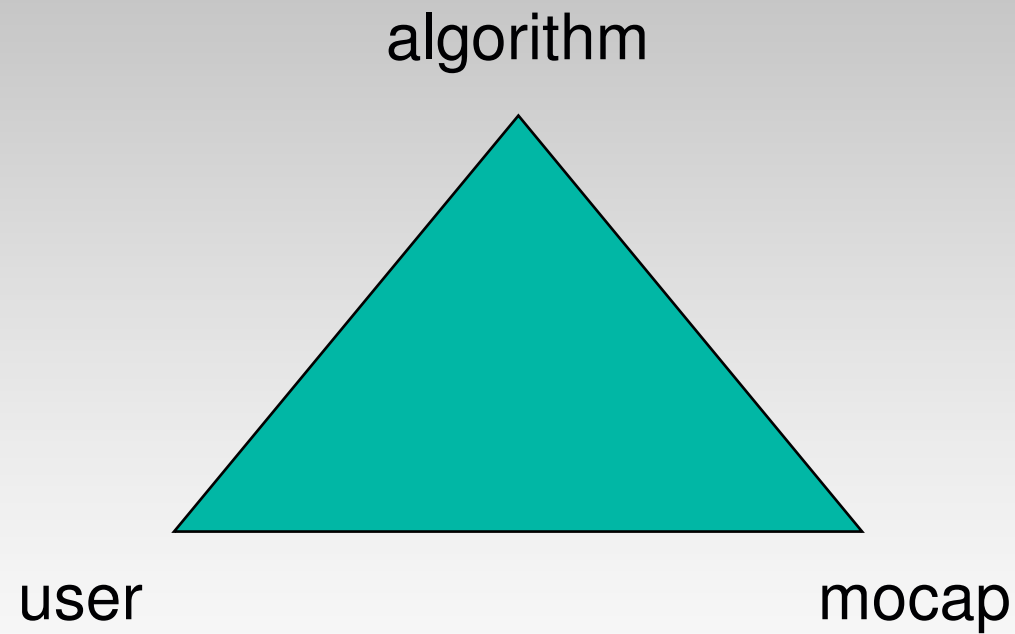
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British Columbia

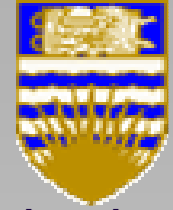
An Introduction to Computer Animation

Michiel van de Panne



Animation Sources





Motion Notation

- 1700 “Choregraphie”, Feuillet
- 1852 “Stenochoregraphie”, Arthur Saint Leon
- 1928 “Notation of Movement”, Margaret Morris
- 1928 “Schrifttanz”, Rudolf von Laban
- 1940 “Kinetography Laban” (Labanotation)
- 1950’s Eshkol & Wachmann: mathematical notation
- 1956 “Choreology”, Joan and Rudolf Benesh

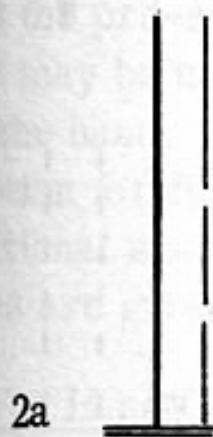


Motion Notation

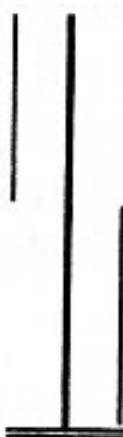
Labanotation

“Labanotation”,
Ann Hutchinson

double starting line.



2a
Actions on the
right side only

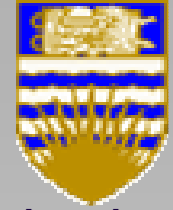


b
An action on
the right then
on the left side



c
A left-sided action fol-
lowed by simultaneous
actions on both sides

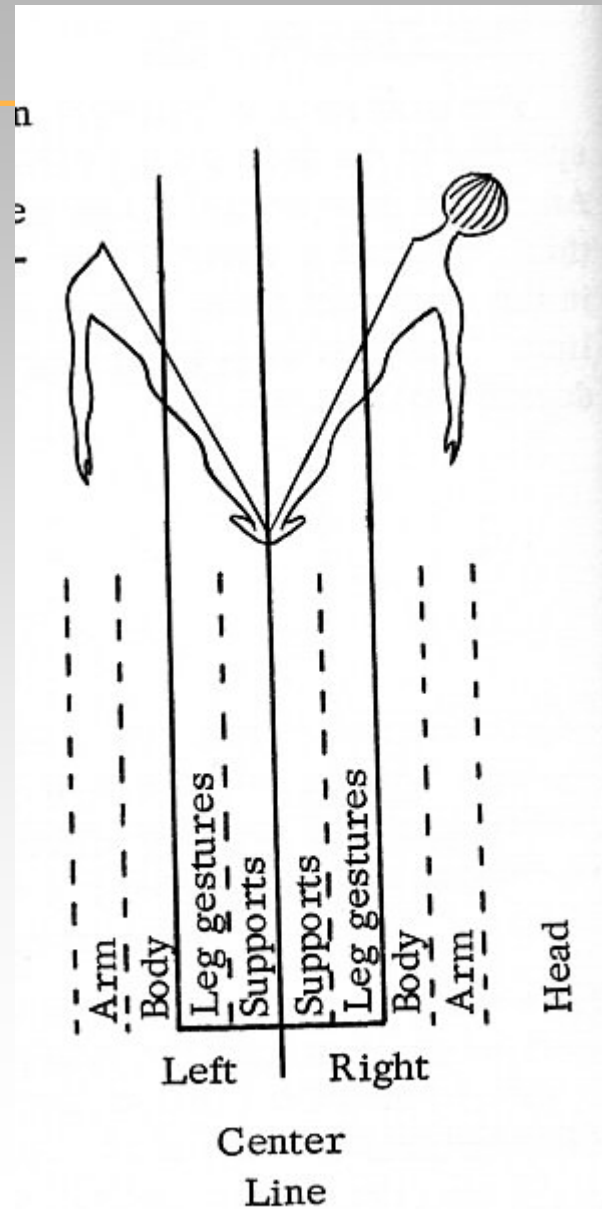
This vertical center line forms the basis of the vertical three-line staff on which structured description is written.

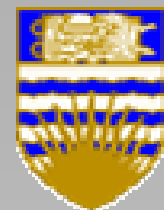


Motion Notation

Labanotation

“Labanotation”,
Ann Hutchinson





Motion Notation

Labanotation

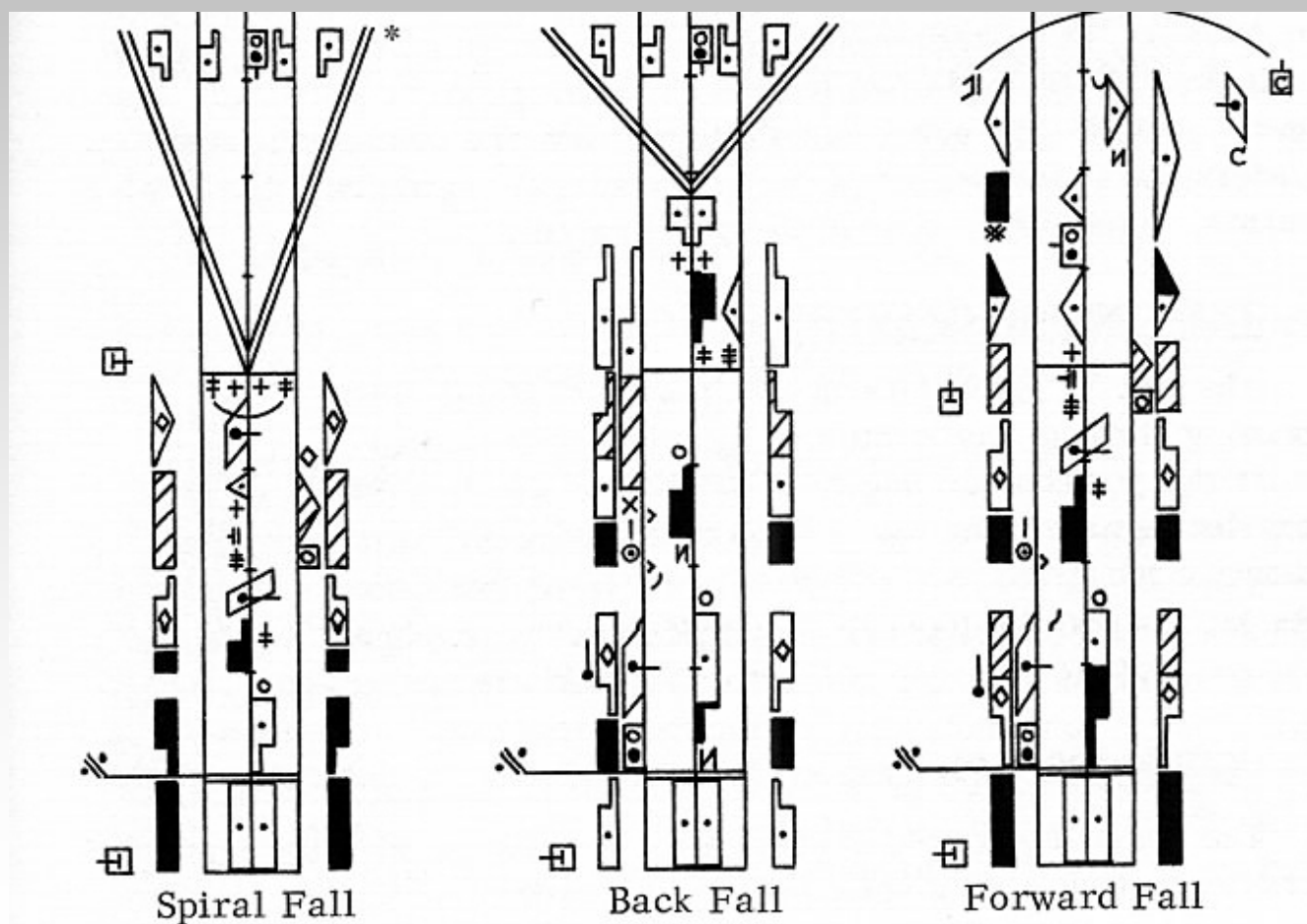
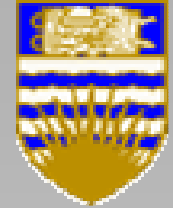


Fig. 607 * See page 468 ** See page 478

“Labanotation”,
Ann Hutchinson

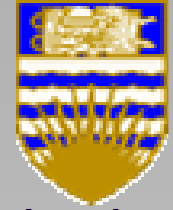


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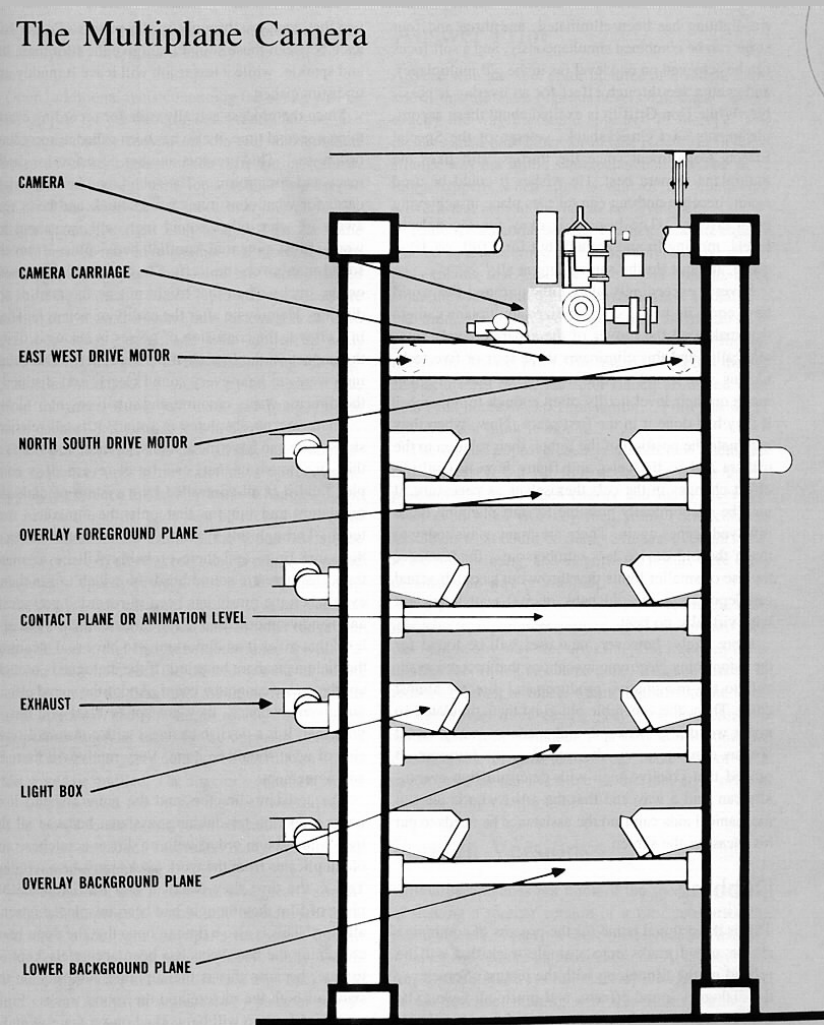
Animation History

Film Animation

- 1914 Windsor McCay – Gertie the Dinosaur
- 1923 Walt Disney, “Alice in Wonderland”
- 1928 Walt Disney, “Mickey Mouse”
- 1969 Burtnyk & Wein, NRCC, computer keyframing
- 1988 Pixar “Tin Toy”
- 1995 Pixar “Toy Story”, full-length CG film
- 2001 Square “Final Fantasy”, CG people

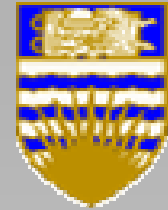


Traditional Animation



(from "The Illusion of Life" Frank Thomas and Ollie Johnson)

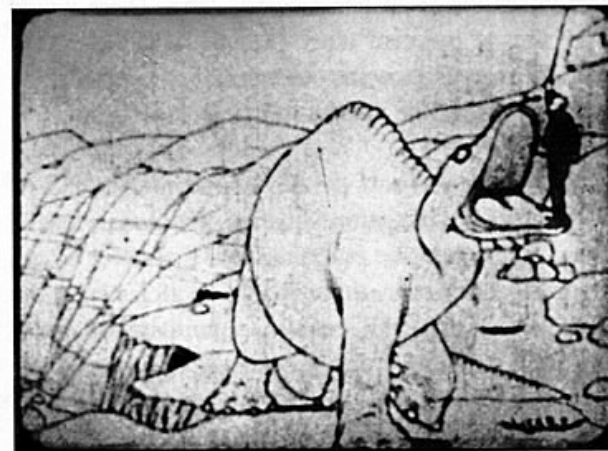
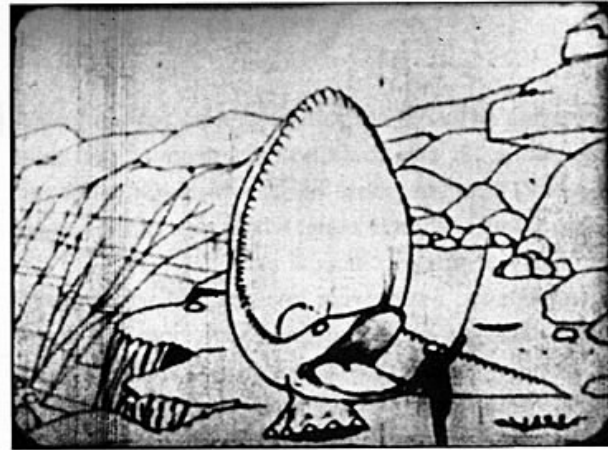
Traditional Animation



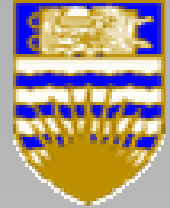
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*ANIMATOR: Winsor McCay—
Gertie the Dinosaur.*

Cartoonist Winsor McCay was the first to recognize animation as an art form. His best remembered film is Gertie the Dinosaur, done in 1914. Historian John Cane-maker points out that Gertie was the first animated personality, showing shyness and stubbornness and eventually weeping big tears when she was criticized. The audience loved it, but ten years later both the film and the techniques had been forgotten.

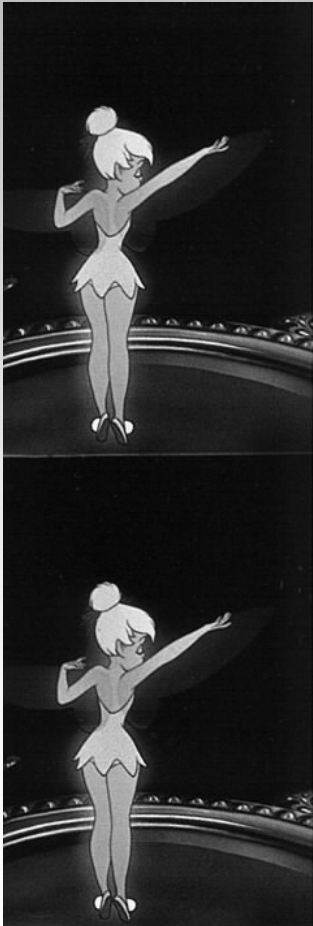


(from “The Illusion of Life” Frank Thomas and Ollie Johnson)

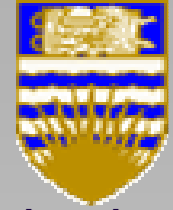


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Traditional Animation



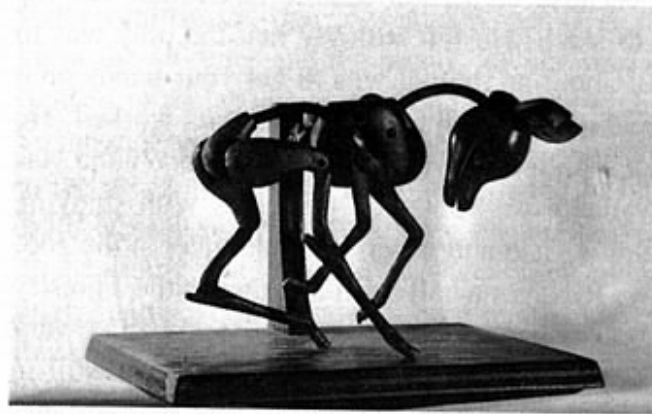
(from "The Illusion of Life" Frank Thomas and Ollie Johnson)



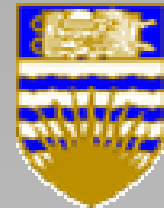
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Traditional Animation

Expert model-makers constructed a jointed armature of a young deer for the animators to study while working on Bambi. Based on Rico Lebrun's drawings, everything moved correctly, right down to the toes.



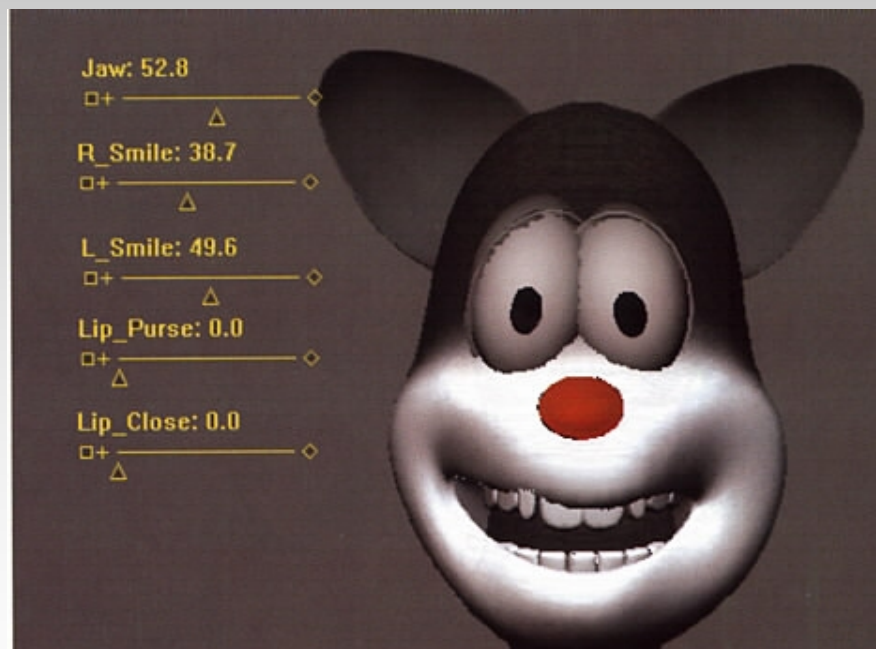
(from "The Illusion of Life"
Frank Thomas and
Ollie Johnson)



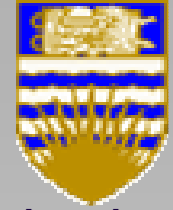
3D Animation (keyframing)



p. 151, “[digital] character animation 2”,
G. Maestri



p. 44, “[digital] character animation 2”,
G. Maestri

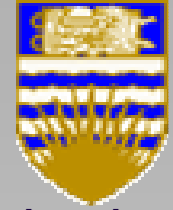


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3D Animation (keyframing)

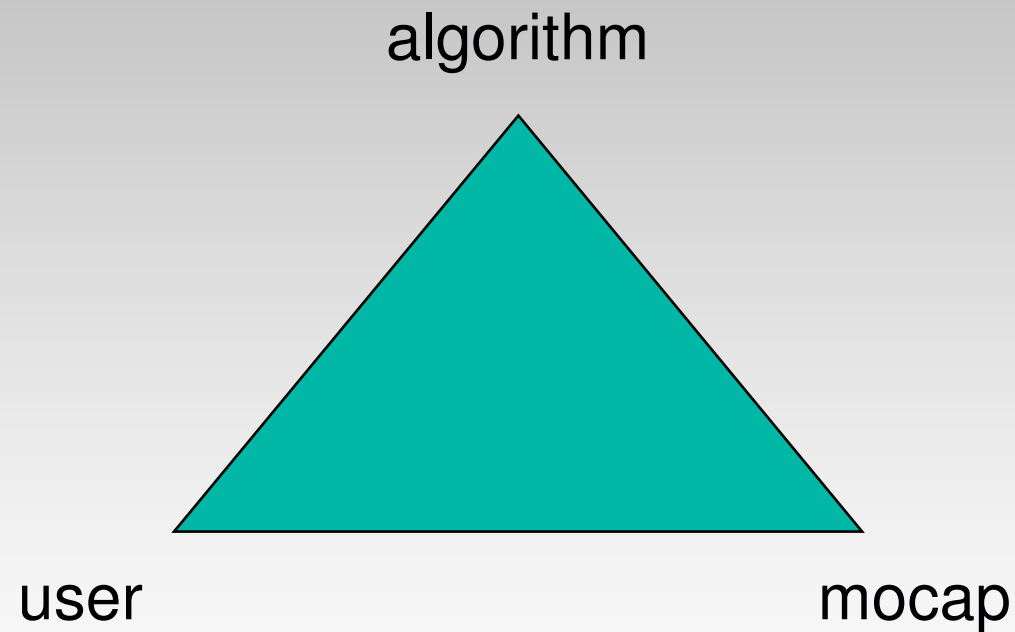
Issues

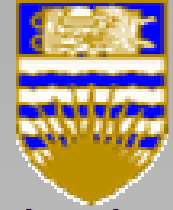
- complete control over motion
- rigging character
- time consuming
- not real-time



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Animation Sources

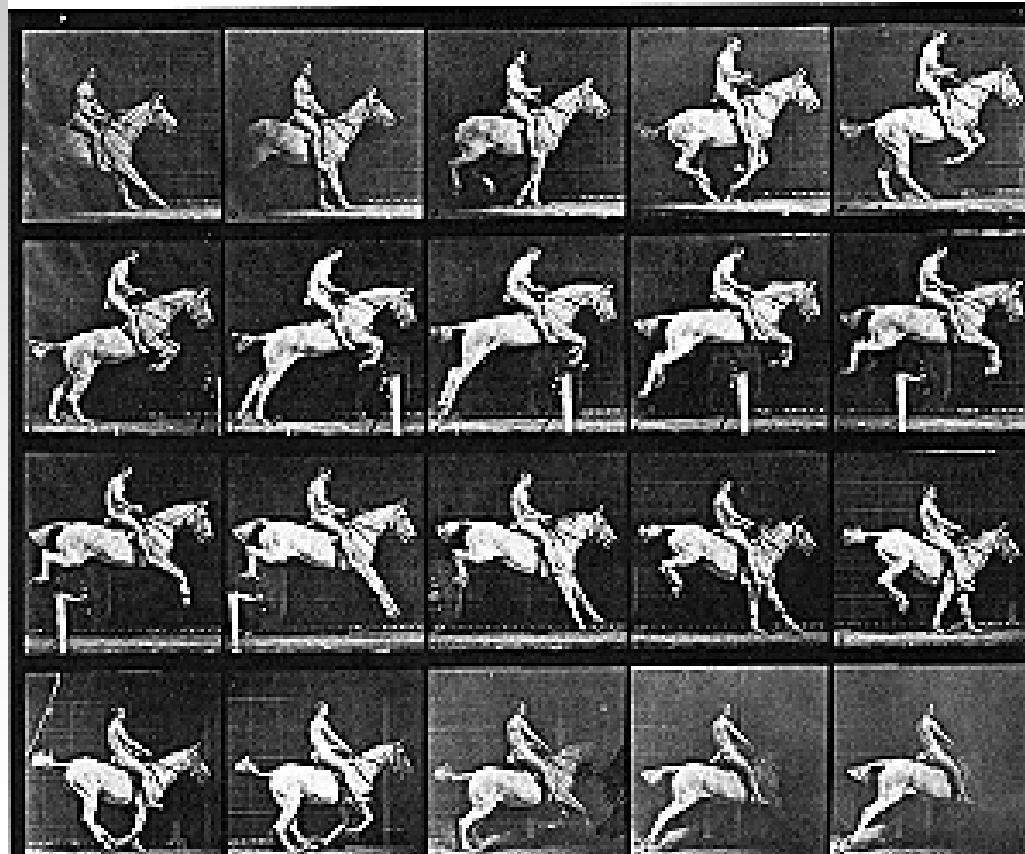




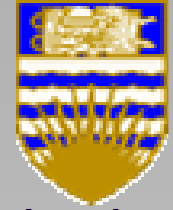
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Motion Capture

Muybridge, 1884 *Rotoscoping*



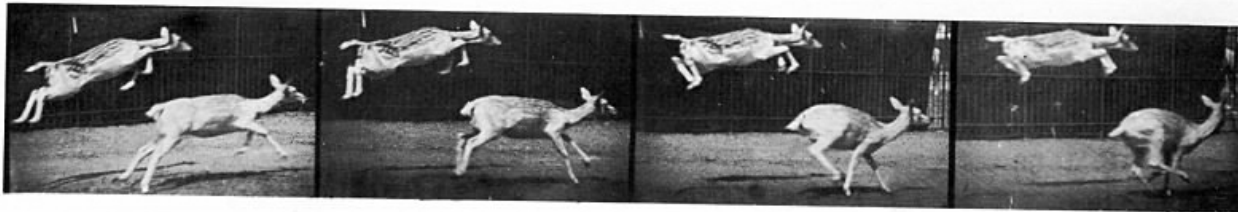
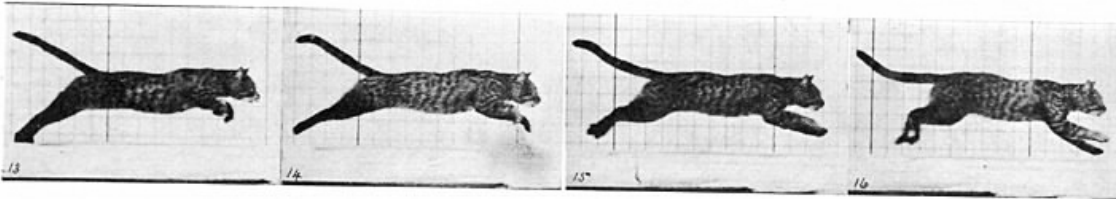
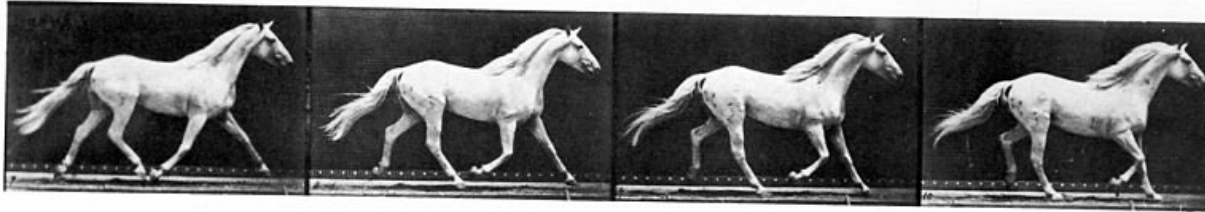
(Figure from
“Animals in Motion”,
Muybridge)



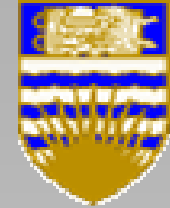
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Motion Capture

Muybridge



(Figure from
“Animals in Motion”,
Muybridge)



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Motion Capture

MotionStar Wireless is the first magnetic tracker to shed its cables and set your performer free. Motion data for each performer is now transmitted through the air to a base station for remote processing.

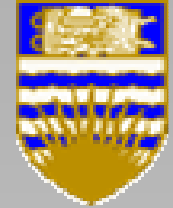
We've combined our world-famous MotionStar™ DC magnetic tracker with the best wireless technology to give you real-time untethered motion capture. There is absolutely no performance compromise. Twist, free

- Freedom of opti
- Stable, long-ran
- Multiple-charact
- High-speed ethe
- Motion previewi
- On-site installati

MotionStar
cables to

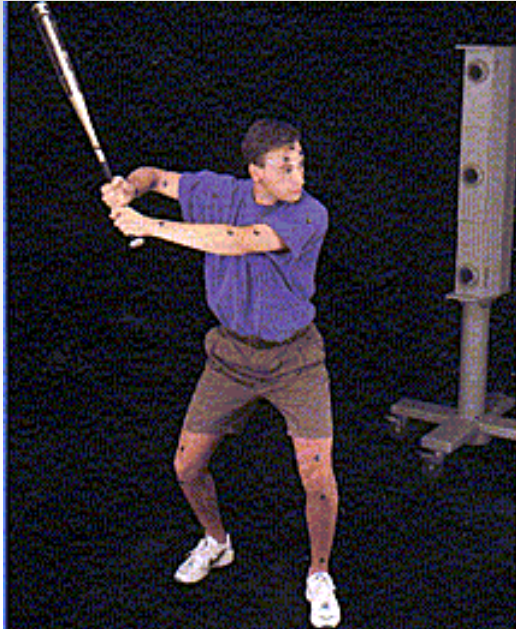
A

(Figure from Ascension Inc.)

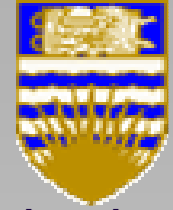


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Motion Capture



(Figure from Northern Digital Inc.)

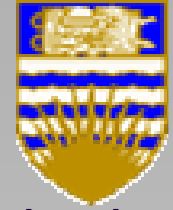


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Motion Capture

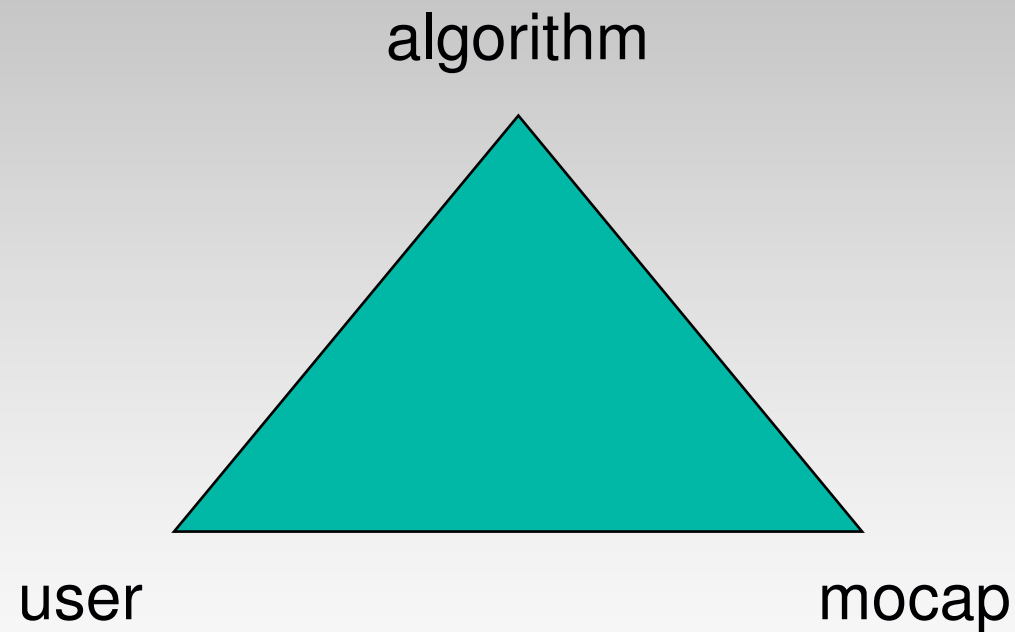
Issues

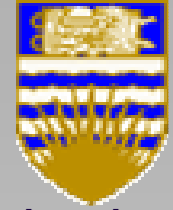
- modifying mocap data
- building graphs
- annotation of data
- data cleanup
- data compression



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Animation Sources





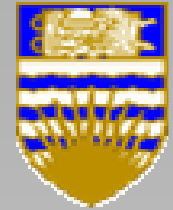
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Physics-based Simulation

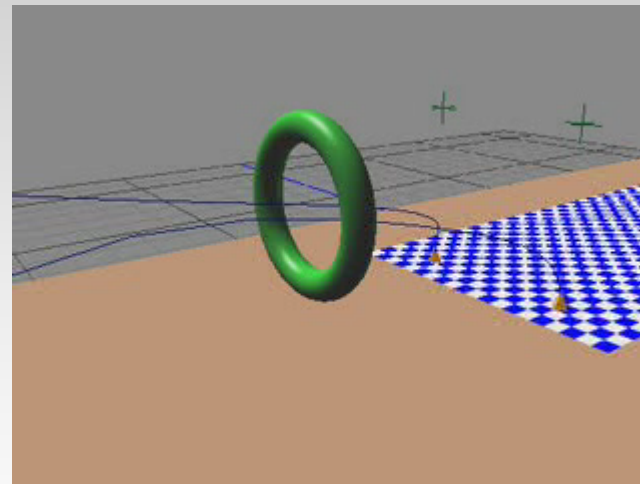
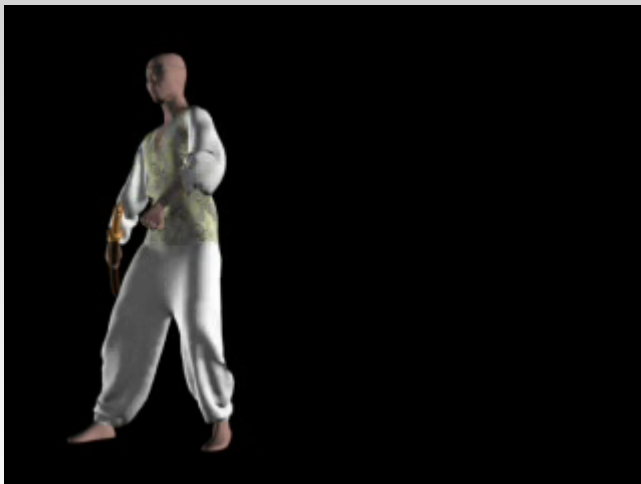
Issues

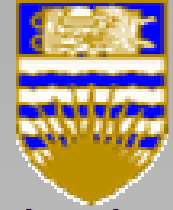
- realistic
- simulation parameters?
- difficult to control

Simulation of Passive Motion



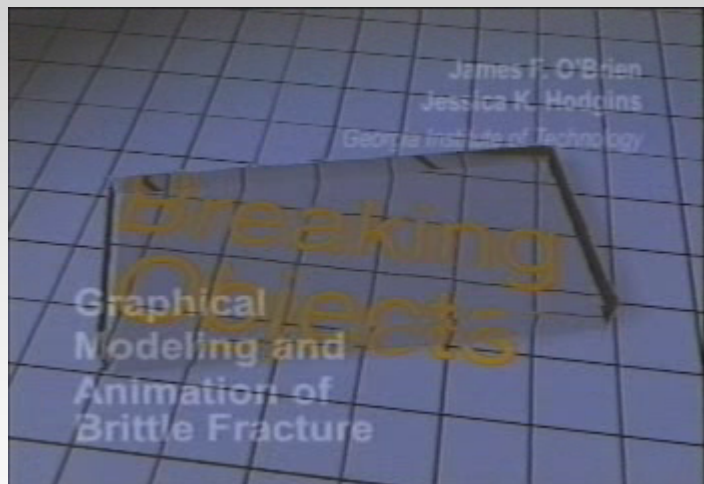
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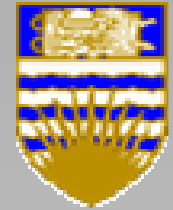


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Simulation of Passive Motion

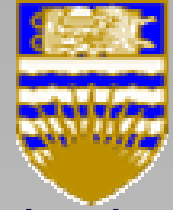


Simulation of Active Motion



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Simulation of Active Motion

