

# Experimental Imaging

A module of the Experience Prototyping Course,  
Umeå Institute of Design, Umeå University  
Fall 2011  
Matt Cottam, Adjunct Professor

## Goal of this course

This course an intensive five-day program aimed at introducing design students to the world of still and motion picture making. It involves many screenings of example works, many technical demonstrations and exercises as well as a final project using stop-motion animation. A great number of both conceptual and technical topics will be covered. For some of these topics students will establish a competency, while other supporting topics will build understanding and further ancillary topics will aim to establish an awareness. It is not an art history course nor is it deep technical training in any one tool—this one week course aims to build excitement about still and moving picture making and provide a springboard toward further learning.

## Core Project

The Secret Life of UID

Imagine and build a world in stop-motion animation where the school itself comes to life. Students, teachers and staff are busy or away and the normally inanimate objects being to move and interact. The play of these artifacts reveal qualities of life and work at UID.

## Syllabus

### DAY 1

#### Images, time and motion

LECTURE: Conventions of verb tense in graphic design, sculpture, photography and animation

- Experience, memory, imagination and unpacking ideas with design
- Evidencing engineering for the Fourth river bridge with photography
- Motion in painting: Nude descending a staircase (Duchamp)
- Motion in sculpture: Unique Forms of Continuity in Space (Boccioni)
- Motion in still photography: Race car (Lartigue)
- Motion in multi-frame photography: Jumping; running straight high jump (Muybridge)
- Early animation devices: Zoetrope
- Dynamism of a Dog on a Leash (Balla)
- Speed: Road Runner (Jones)
- Multi-plane camera (Disney)
- Cartoon physics
- Mixing conventions: Rabbit (Wrake)
- More mixed conventions: SX-70 (Eames)
- Enter 3D - Darkness Light Darkness (Svankmajer)
- Puppets and sets: Wallace and Grommit: It's a bomb! And, how it was done (Aardman)
- More mixed conventions: pixellation: In Your Arms. And, how it was done (Jardin)

#### Quick dive into stop frame animation:

#### Introduction to Dragonframe stop motion software and workflow

- What Dragonframe does
- Interface tour

- Animation window
- Frames and frame rates
- Taking and deleting frames
- Onion skinning
- Timeline panel
- Productions, scenes and takes
- Built-in camera and connecting an external camera
- Easing motion
- View: Deadline (Bang-Yau Liu)

Assignment: Sticky-note Pong

## DAY 2

### Photography:

#### Cameras, Light and the Cinematography tools in Dragonframe

- The camera: Film, DSLR, CSC
- Lenses, focal length and field of view
- Aperture (light gathering and Depth of field), Shutter Speed (light gathering and stopping motion) and Film Speed (light sensitivity of recording device and grain)
- Manual, Aperture Priority and Shutter Priority modes
- Light and light metering (matrix, center-weighted, spot)
- Camera stabilization
- The Cinematography window in Dragonframe
- Aspect ratios

Exercise: create images: 1. short DoF, stopped motion; 2. Short DoF with motion blur; 3. long DoF with stopped motion; 4. long DoF with motion bur. (allow for comparison in scene)

- Sensors (size, resolution)
- File types (RAW, TIFF, JPEG)
- Working with studio lights and strobes
- Types of light sources, color temperature and white balance
- Diffusion, reflectors, modifiers, flags and color correcting gels

Assignment: Create 5 still-photographs of keyframes as a mood board for your animation

## DAY 3

### Sound and Pre-Production

- Dots (McLaren)
- Western Spaghetti (PES)
- Creature Comforts (Park)
- Sound in Dragonframe (.aiff or .wav)
- The XSheet in Dragonframe
- Importing and exporting with Dragonframe
- Compiling takes with After Effects
- Exporting to video (1280x720 Quicktime (.mov) with h.264 codec and 5-10 Mbps)

In-class: Brainstorm storyboards in-class

Assignment: create complete storyboard and collect all materials for sets and props

## DAY 4

### Production

- Shoot everything!
- Glimpse of motion control and automated lighting

## DAY 5

### Post-production

- Bring it all together to a final exported video file by 4PM

### Premier!

- Student shorts will be screened during the UID Fall Summit

## Bibliography

### ARTISTS

#### **Aardman Animations**

<http://www.aardman.com/>

#### You Tube Channel

<http://www.youtube.com/user/aardman>

#### History of Aardman (playlist, 9 episodes)

[http://www.youtube.com/watch?v=oZ-oXyYmlcc&feature=list\\_related&playnext=1&list=SP1225DB81D6CE7DCC](http://www.youtube.com/watch?v=oZ-oXyYmlcc&feature=list_related&playnext=1&list=SP1225DB81D6CE7DCC)

#### Studio Tour

<http://www.youtube.com/watch?v=wRgTB9VS4HA&feature=related>  
<http://www.youtube.com/watch?v=V1G8kXNMrs&feature=related>

#### Making of NYTOL

<http://www.youtube.com/watch?v=VLaOhNSg2gU&feature=related>

#### Wallace and Grommit: Cracking Contraptions Behind the Scenes

<http://www.youtube.com/watch?v=0rkh-Vsqs0o&feature=related>

#### Excerpt from Wallace and Grommit, A matter of loaf and death

<http://www.youtube.com/watch?v=DhdfLfyxVql&feature=related>

#### A Grand Day Out with Wallace and Grommit: Building a Rocket

[http://www.youtube.com/watch?v=5jvOTsi3i64&feature=results\\_video&playnext=1&list=PL86F72379FCA795ED](http://www.youtube.com/watch?v=5jvOTsi3i64&feature=results_video&playnext=1&list=PL86F72379FCA795ED)

#### Pib and Pog

<http://www.youtube.com/watch?v=ta7VHKGuoJY>

#### Off Beat

[http://www.youtube.com/watch?v=9zRiN\\_SOYXY&feature=fvwrel](http://www.youtube.com/watch?v=9zRiN_SOYXY&feature=fvwrel)

**Timo Arnall**

<http://www.nearfield.org/>

Immaterials: Light Painting WiFi

<http://vimeo.com/channels/touch>

Immaterials: Ghost in the Machine

<http://vimeo.com/channels/touch#7022707>

Nearness

<http://vimeo.com/channels/touch#6588461>

Making Future Magic

<http://vimeo.com/14958082>

Suwapuu

<http://www.dentsulondon.com/blog/2011/04/05/introducing-suwappu/>

**Giacomo Balla**

[http://en.wikipedia.org/wiki/Giacomo\\_Balla](http://en.wikipedia.org/wiki/Giacomo_Balla)

**Bang-Yao Liu**

Deadline

<http://www.youtube.com/watch?v=BpWM0FNPZSs>

**Umberto Boccioni**

<http://en.wikipedia.org/wiki/Boccioni>

Unique Forms of Continuity in Space

[http://www.moma.org/collection/object.php?object\\_id=81179](http://www.moma.org/collection/object.php?object_id=81179)

**Robert Bradbrook**

<http://www.bradfilms.co.uk/>

**Stan Brakhage**

[http://en.wikipedia.org/wiki/Stan\\_Brakhage](http://en.wikipedia.org/wiki/Stan_Brakhage)

**Robert Breer**

[http://en.wikipedia.org/wiki/Robert\\_Breer](http://en.wikipedia.org/wiki/Robert_Breer)

<http://www.nytimes.com/2011/08/18/movies/robert-breer-pioneer-of-avant-garde-animation-dies-at-84.html>

Eyewash 1959

[http://www.youtube.com/watch?v=qp\\_gxPc8uLk&feature=related](http://www.youtube.com/watch?v=qp_gxPc8uLk&feature=related)

An Man and his Dog our for a Walk

[http://www.youtube.com/watch?v=GDC\\_\\_k-Zwx8&feature=related](http://www.youtube.com/watch?v=GDC__k-Zwx8&feature=related)

Blazes

<http://www.youtube.com/watch?v=fHvYoaP5Od4&feature=related>

## **Brothers Quay**

[http://en.wikipedia.org/wiki/Brothers\\_Quay](http://en.wikipedia.org/wiki/Brothers_Quay)

Excerpt from Street of Crocodiles

<http://www.youtube.com/watch?v=N6xG4Nf9Dh4>

## **Paul Bush**

<http://www.paulbushfilms.com/>

## **Mario Cavalli**

<http://colonymedia.co.uk/mariocavalli/>

## **Walt Disney**

[http://en.wikipedia.org/wiki/Walt\\_Disney](http://en.wikipedia.org/wiki/Walt_Disney)

MultiPlane camera (1957)

<http://www.youtube.com/watch?v=8d4-AUwkKAw>

Sorcerer's Apprentice (1940)

<http://www.youtube.com/watch?v=XChxLGnlwCU>

## **Marcel Duchamp**

[http://en.wikipedia.org/wiki/Marcel\\_Duchamp](http://en.wikipedia.org/wiki/Marcel_Duchamp)

## **Charles and Ray Eames**

[http://en.wikipedia.org/wiki/Charles\\_and\\_Ray\\_Eames](http://en.wikipedia.org/wiki/Charles_and_Ray_Eames)

SX-70

<http://www.youtube.com/watch?v=4EdwmaQltHc>

Mathematical Peepshows

<http://www.youtube.com/watch?v=8On7yCU1EjQ>

<http://www.youtube.com/watch?v=hnds9-GmwkM>

## **Ed Emshwiller**

[http://en.wikipedia.org/wiki/Ed\\_Emshwiller](http://en.wikipedia.org/wiki/Ed_Emshwiller)

Thanatopsis (1962)

[http://www.youtube.com/watch?v=yDoH\\_KGTR7A&feature=related](http://www.youtube.com/watch?v=yDoH_KGTR7A&feature=related)

## **Oskar Fischinger (1900-1967)**

[http://en.wikipedia.org/wiki/Oskar\\_Fischinger](http://en.wikipedia.org/wiki/Oskar_Fischinger)

(lumigraph, color organ)

<http://www.centerforvisualmusic.org/Fischinger/Lumigraph.htm>

Lumigraph Film (by Elfriede Fischinger, 1969)

<http://vimeo.com/13787280>

Early Abstractions

<http://www.youtube.com/watch?v=-wYJ51nSXRQ&feature=related>

<http://www.youtube.com/watch?v=KRJAoJVp8cU&feature=related>

<http://www.youtube.com/watch?v=RrZxw1Jb9vA&feature=related>

<http://www.youtube.com/watch?v=TNh12zaFtxo&feature=related>

**Oliver Harrison**

<http://www.oliverharrison.com/>

Royal Mail advert (typography)

<http://www.youtube.com/watch?v=xZWRRL-P-Qs>

**Jonathan Hodgson**

<http://www.hodgsonfilms.com/>

**Greg Jardin**

<http://www.gregjardin.com/>

In your Arms

<http://www.youtube.com/watch?NR=1&v=cIH4MJAC2Tg>

Making of In Your Arms

<http://www.youtube.com/watch?NR=1&v=cIH4MJAC2Tg>

**Chuck Jones**

[http://en.wikipedia.org/wiki/Chuck\\_Jones](http://en.wikipedia.org/wiki/Chuck_Jones)

Coyote Catches Roadrunner (Looney Tunes & Merry Melodies)

<http://www.youtube.com/watch?v=KJJW7EF5aVk>

Wile E. Coyote and Road Runner

[http://en.wikipedia.org/wiki/Wile\\_E.\\_Coyote\\_and\\_Road\\_Runner](http://en.wikipedia.org/wiki/Wile_E._Coyote_and_Road_Runner)

**Jacques Henri Lartigue**

[http://en.wikipedia.org/wiki/Jacques\\_Henri\\_Lartigue](http://en.wikipedia.org/wiki/Jacques_Henri_Lartigue)

**Len Lye**

[http://en.wikipedia.org/wiki/Len\\_Lye](http://en.wikipedia.org/wiki/Len_Lye)

<http://www.youtube.com/watch?v=sGyVYDseGc4>

A Colour Box

<http://www.youtube.com/watch?v=T3y1offmJ4Y>

Swinging the Lambeth Walk

<http://www.youtube.com/watch?v=Q57IUSz0Oyw&feature=related>

The Peanut Vendor (1933)

<http://www.youtube.com/watch?v=eQYZPwEdPoo&feature=related>

Tusalava, Part 1

<http://www.youtube.com/watch?v=cailpf62ld8&feature=related>

Tusalava, Part 2

<http://www.youtube.com/watch?v=HX6hbxEpmuc&feature=related>

**Winsor McCay**

[http://en.wikipedia.org/wiki/Winsor\\_McCay](http://en.wikipedia.org/wiki/Winsor_McCay)

Little Nemo (1911)

<http://www.youtube.com/watch?v=kcSp2ej2S00>

**Tim MacMillan**

<http://www.timeslicefilms.com/>

Early timeslice work

<http://www.youtube.com/watch?v=ocLJWCnMhTo>

Ferment

<http://www.youtube.com/watch?v=zNZ97Ez6wOY>

Bullet time

[http://en.wikipedia.org/wiki/Bullet\\_time](http://en.wikipedia.org/wiki/Bullet_time)

**Norman McLaren**

[http://en.wikipedia.org/wiki/Norman\\_McLaren](http://en.wikipedia.org/wiki/Norman_McLaren)

Dots

<http://www.youtube.com/watch?v=E3-vsKwQ0Cg>

**Lazlo Maholy-Nagy**

[http://en.wikipedia.org/wiki/L%C3%A1szl%C3%B3\\_Moholy-Nagy](http://en.wikipedia.org/wiki/L%C3%A1szl%C3%B3_Moholy-Nagy)

Light Space Modulator

[http://www.youtube.com/results?search\\_query=maholy+nagy+light&aq=f&aql=f](http://www.youtube.com/results?search_query=maholy+nagy+light&aq=f&aql=f)

George Eastman House collection of photographs and photograms

<http://www.geh.org/fm/amico99/htmlsrc2/>

Blog post about photograms exhibition

<http://artblart.wordpress.com/2010/01/28/exhibition-laszlo-moholy-nagy-%E2%80%A8retrospective-at-schirn-kunsthalle-frankfurt/>

The Art of Light (book)

<http://www.amazon.com/Laszlo-Moholy-Nagy-Oliva-Maria-Rubio/dp/8492841346>

Vision in Motion (book)

[http://www.amazon.com/Vision-Motion-Laszlo-Moholy-Nagy/dp/0911498001/ref=sr\\_1\\_3?ie=UTF8&qid=1320509320&sr=8-3](http://www.amazon.com/Vision-Motion-Laszlo-Moholy-Nagy/dp/0911498001/ref=sr_1_3?ie=UTF8&qid=1320509320&sr=8-3)

**Eadweard Muybridge**

<http://en.wikipedia.org/wiki/Muybridge>

Jumping; running straight high jump

[http://www.flickr.com/photos/george\\_eastman\\_house/3333249917/sizes/o/in/photostream/](http://www.flickr.com/photos/george_eastman_house/3333249917/sizes/o/in/photostream/)

**Jonas Odell**

<http://www.filmtecknarna.se/directors/work/?director=6>

**Nick Park**

[http://en.wikipedia.org/wiki/Nick\\_Park](http://en.wikipedia.org/wiki/Nick_Park)

<http://www.imdb.com/name/nm0661910/>

Creature comforts

<http://www.youtube.com/watch?v=UPwArY94s34&feature=related>

**Priit Parn**

[http://en.wikipedia.org/wiki/Priit\\_P%C3%A4rn](http://en.wikipedia.org/wiki/Priit_P%C3%A4rn)

Kolmnurk

<http://www.youtube.com/watch?v=uMYjDg93kQQ>

Operatoor Kops

[http://www.youtube.com/watch?v=glqnONEC\\_HM&feature=related](http://www.youtube.com/watch?v=glqnONEC_HM&feature=related)

**Adam Pesapane (PES)**

[http://en.wikipedia.org/wiki/PES\\_\(director\)](http://en.wikipedia.org/wiki/PES_(director))

Western Spaghetti

[http://www.youtube.com/watch?v=qBjLW5\\_dGAM](http://www.youtube.com/watch?v=qBjLW5_dGAM)

Deep

[http://www.eatpes.com/the\\_deep.html](http://www.eatpes.com/the_deep.html)

Kaboom

<http://www.eatpes.com/kaboom.html>

**Harry Smith**

[http://en.wikipedia.org/wiki/Harry\\_Everett\\_Smith](http://en.wikipedia.org/wiki/Harry_Everett_Smith)

**Jan Svankmejer**

[http://en.wikipedia.org/wiki/Jan\\_%C5%A0vankmajer](http://en.wikipedia.org/wiki/Jan_%C5%A0vankmajer)

The Cabinet of Jan Svankmajer (Documentary) Part 1

<http://www.youtube.com/watch?v=36Tsggm6LWY>

The Cabinet of Jan Svankmajer (Documentary) Part 2

<http://www.youtube.com/watch?v=bwc1t44z4x4>

Darkness Light Darkness

<http://www.youtube.com/watch?v=LuBwXfg3Mr4>

Heaven and Earth Magic (excerpt)

<http://www.youtube.com/watch?v=Jh0vVK9LpZU&feature=related>

**Run Wrake**

<http://www.runwrake.com/>

Rabbit

<http://www.youtube.com/watch?v=fw3XyOyl47Q&feature=related>

---

[ NOTE: Some of these listings are by director, some by producer, some by group of artists – almost all of these works were created by teams of people and they are only listed under one name to help students easily find works as they were referenced in the course]

[ THANKS: to Timo Arnall for co-teaching photography, film and animation with me and for contributing to this list of artists.]

---



## WEB SITES

Art of the Title

<http://www.artofthetitle.com/>

The cartoon laws of physics

<http://remarque.org/~doug/cartoon-physics.html>

The Physics of Road Runner

[http://www.lghs.net/ourpages/users/dburns/RRPhysics/Road\\_Runner\\_Physics/Movie.html](http://www.lghs.net/ourpages/users/dburns/RRPhysics/Road_Runner_Physics/Movie.html)

Depicting Speed in Comics

<http://johnrozumforkids.blogspot.com/2010/11/depicting-speed-in-comics-part-1.html>

## TECHNICAL TOPICS

Digital Photography on Wikipedia

[http://en.wikipedia.org/wiki/Digital\\_photography](http://en.wikipedia.org/wiki/Digital_photography)

Depth of field (DoF)

<http://www.cambridgeincolour.com/tutorials/depth-of-field.htm>

DoF: Hyperfocal distance calculator

<http://www.dofmaster.com/dofjs.html>

DoF: Bokeh

<http://www.kenrockwell.com/tech/bokeh.htm>

RAW

[http://en.wikipedia.org/wiki/Raw\\_image\\_format](http://en.wikipedia.org/wiki/Raw_image_format)

TIFF

<http://en.wikipedia.org/wiki/TIFF>

JPEG

<http://en.wikipedia.org/wiki/JPEG>

Stop motion animation

[http://en.wikipedia.org/wiki/Stop\\_motion](http://en.wikipedia.org/wiki/Stop_motion)

Image Sensor Size

[http://en.wikipedia.org/wiki/Image\\_sensor\\_format](http://en.wikipedia.org/wiki/Image_sensor_format)

Through-the-lens metering (TTL)

[http://en.wikipedia.org/wiki/Through-the-lens\\_metering](http://en.wikipedia.org/wiki/Through-the-lens_metering)

Color temperature

[http://en.wikipedia.org/wiki/Color\\_temperature](http://en.wikipedia.org/wiki/Color_temperature)

Color of various light types and white balance

<http://www.digicamguides.com/learn/white-balance.html>

Color correction with Gels

[http://en.wikipedia.org/wiki/Color\\_correction](http://en.wikipedia.org/wiki/Color_correction)

The forum for DSLR filmmakers

[www.cinema5d.com](http://www.cinema5d.com)

Tilt-shift, how it works

<http://cow.mooh.org/projects/tiltshift/howdoesitwork.html#perspectivecorrection>

Dragonframe tutorials

<http://www.dragonframe.com/tutorials.php>

50 Incredible Stop-Motion Videos (Smashing Magazine)

<http://www.smashingmagazine.com/2008/12/31/50-incredible-stop-motion-videos/>

Wikipedia page for Stop-Motion

[http://en.wikipedia.org/wiki/Stop\\_motion](http://en.wikipedia.org/wiki/Stop_motion)

Ken Rockwell (photography gear reviews and tutorials)

<http://www.kenrockwell.com/>

<http://www.kenrockwell.com/tech.htm>

Studio Lighting article

<http://www.photographers.co.uk/html/photographic-studio-lighting.cfm>

MrMoCo (motion control kit)

<http://www.mrmoco.com/products/>

OpenMoco

<http://openmoco.org/>

Megapixels (myth?)

<http://www.kenrockwell.com/tech/mpmyth.htm>

Course outline and final films from 2010 (taught by Arnall, Cottam)

[http://www.interactiondesign.se/wiki/courses:2010\\_exp\\_prototyping\\_week40](http://www.interactiondesign.se/wiki/courses:2010_exp_prototyping_week40)

Strobist.blogspot

<http://strobist.blogspot.com/>

Lighting 101 (Strobist)

<http://strobist.blogspot.com/2006/03/lighting-101.html>

Strobist flickr pool

<http://www.flickr.com/groups/strobist/pool/>

Rolling Shutter

<http://m43photo.blogspot.com/2010/07/rolling-shutter.html>

Zoetrope

<http://www.youtube.com/watch?v=dKEM5sYnOjE>

MultiPlane camera (1957)

[http://www.youtube.com/watch?feature=player\\_embedded&v=YdHTIUGN1zw](http://www.youtube.com/watch?feature=player_embedded&v=YdHTIUGN1zw)

## EQUIPMENT SUPPLIERS

Dragonframe

<http://www.dragonframe.com/>

Kessler Crane

<http://www.kesslercrane.com/>

Film Tools

<http://www.filmtools.com/>

-----  
Matt Cottam

Cofounder, Tellart & Adjunct Professor, UID

-----  
[www.tellart.com](http://www.tellart.com)   [matt@tellart.com](mailto:matt@tellart.com)