



# Technical Problems with Making a Moving Painting

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## Introduction



'Animated painting' is an oxymoron, because animation, an image that changes over time, seems fundamentally opposed to painting, a hard image that is expected to remain constant over decades and centuries. This work is an attempt to synthesize these contradictory ideas into a novel form of artistic expression.

### Paintings

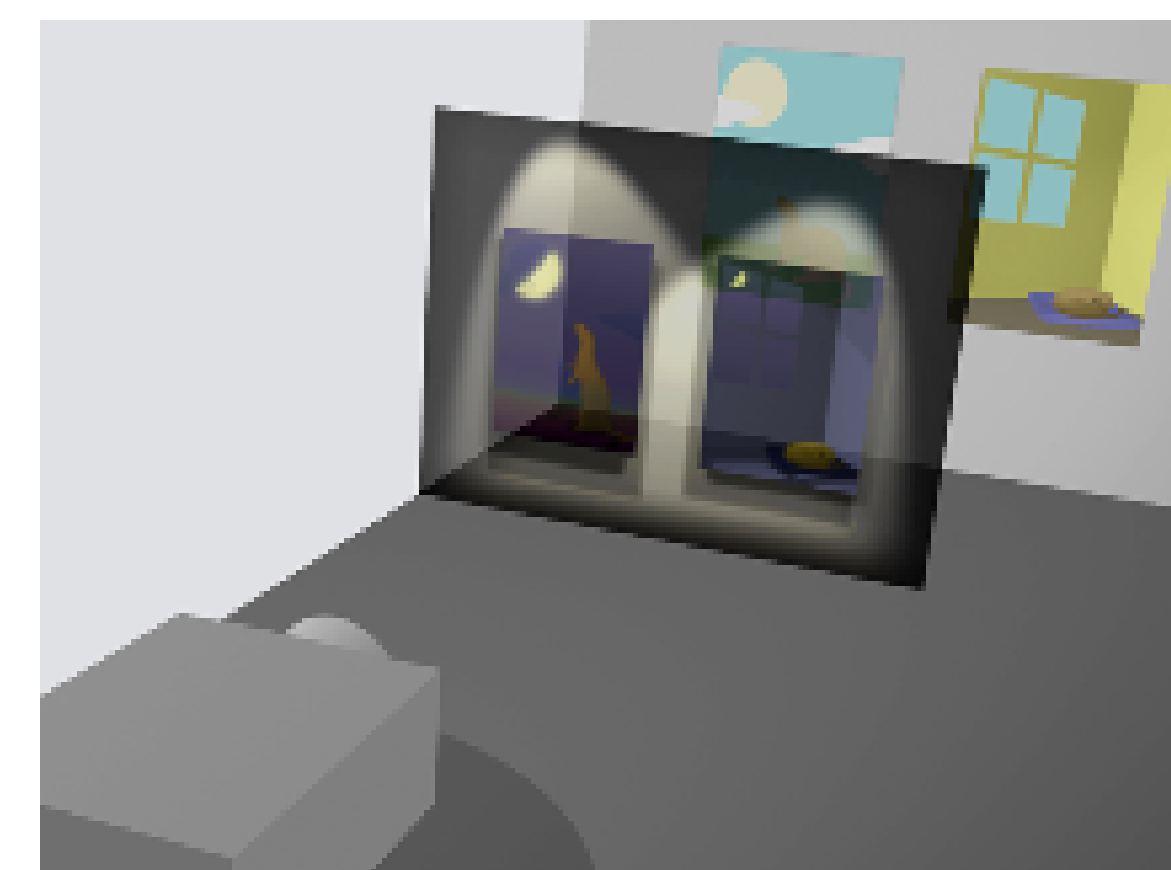
- examine at leisure without missing anything
- viewed in contemplative mode
- ideal for complex static images

### Animation

- current content needed for future interpretation
- 'focused' viewing mode
- use to explore an artist's dynamic vision

## Setup and Process

- acrylic paintings on stretched canvas, hung on a wall
- illumination provided by a data projector:
  - animated light pattern to make paintings move
  - simulated gallery lighting and cast shadows



1. create animation
2. project a single frame onto blank canvas
3. trace outlines onto canvas
4. paint each area with flat colours
5. identify areas that change colour during animation
6. adjust the animation



## Colour Adjustment Algorithm

Light reflected from a painting at a point

$$S(\lambda) \sum_i R_i \phi_i(\lambda)$$

Colour perceived by the viewer

$$X_j = \int S(\lambda) \sum_i R_i \phi(\lambda) \bar{x}_j(\lambda) d\lambda = \sum_i R_i M_{ij}(S)$$

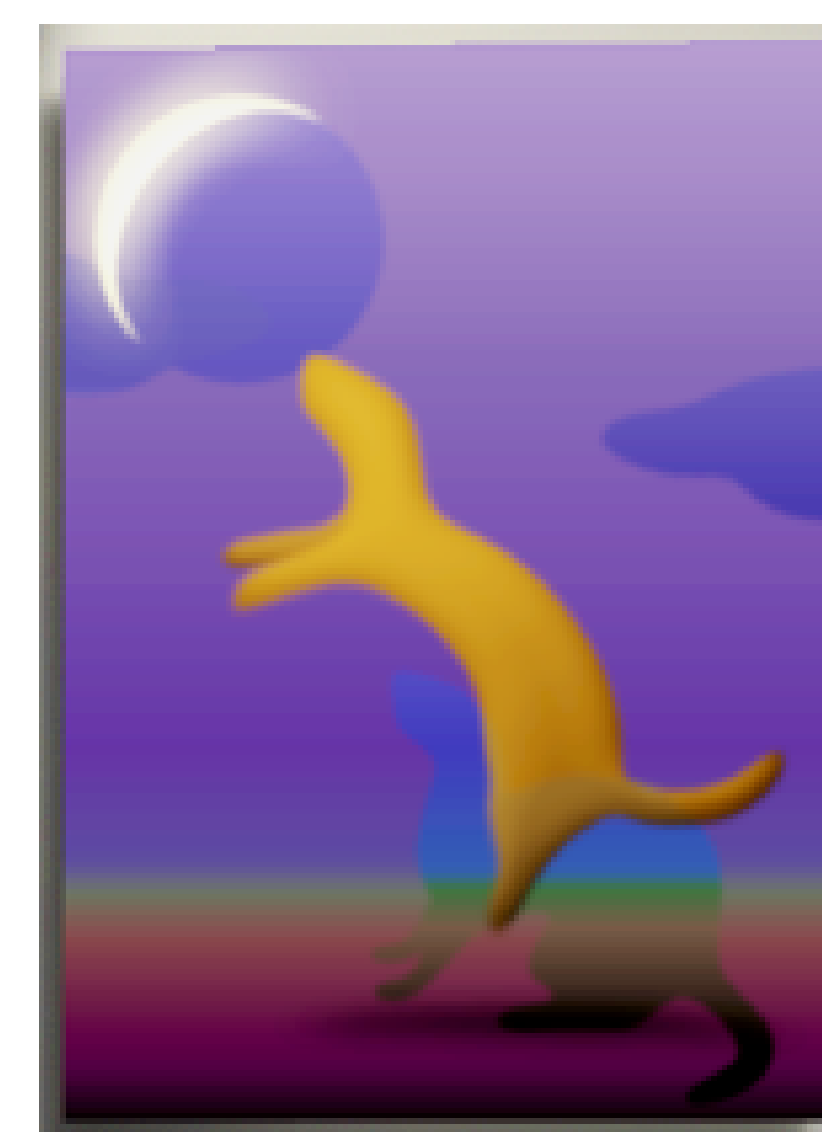
To make two areas with different spectral reflectances look the same, solve linear equation:

$$\sum_i R'_i M_{ij}(S') = \sum_i R_i M_{ij}(S)$$

- extensive calibration needed
- finite colour gamuts limit artist's choice of paints
- $M_{ij}(S)$  diagonally dominant if colours are unsaturated



original image



adjusted image

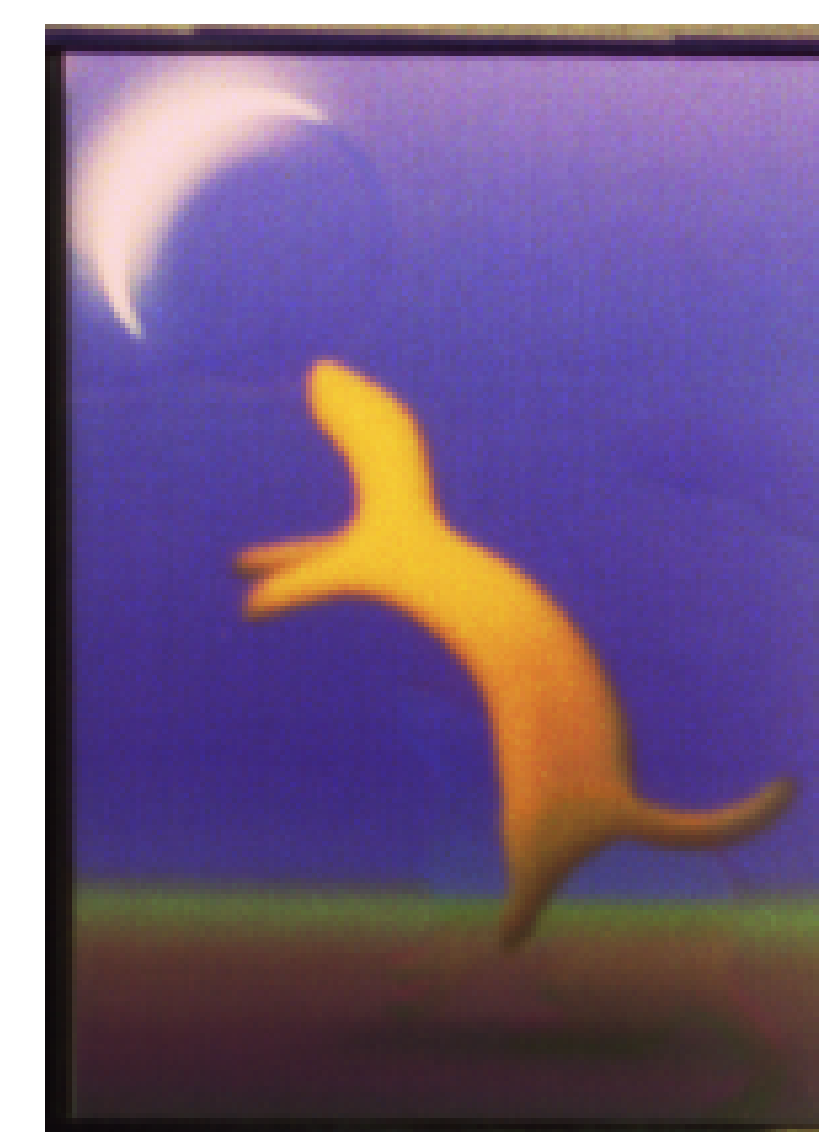


image on canvas

### In practice

- colour can be achieved by a linear adjustment
- interactively change projected light using expressions in Side Effects Houdini
- match colours using 'visual photometry'
- unsaturated paints allow for a wider colour range
- an artistic style with relatively uniform coloured areas reduces the requirement for colour adjustment

## Other Issues



- enforce 'display is a painting' by gradual introduction of animation
- use soft edges since crisp paint lines can't be hidden
- areas of rapid movement doesn't need to be adjusted as accurately
- 'black level' is brighter than no light
- canvas not a perfect rectangle

## Installation of Artwork



*In the Still of Night* in an exhibition at Waterloo

## Acknowledgments



Many thanks to Art Green for supervising *In the Still of Night*, to Josée Lajoie, Don Mackay and Stephen Mann for their comments and suggestions, and to Selina's ferrets for their inspiration.