

Computational Media Research

CMPM 202, W2020

Week 5, Thursday: Creative AI

Prof. Angus Forbes (instructor)

<https://creativecoding.soe.ucsc.edu>

angus@ucsc.edu

Creative AI

NIPS Workshop on ML for Creativity and Design

IEEE VIS Arts Program

SIGGRAPH Arts Gallery and Arts Papers

ACM/EG Expressive

FDG Workshop on Procedural Content
Generation

ACM CHI “Art.CHI” Program

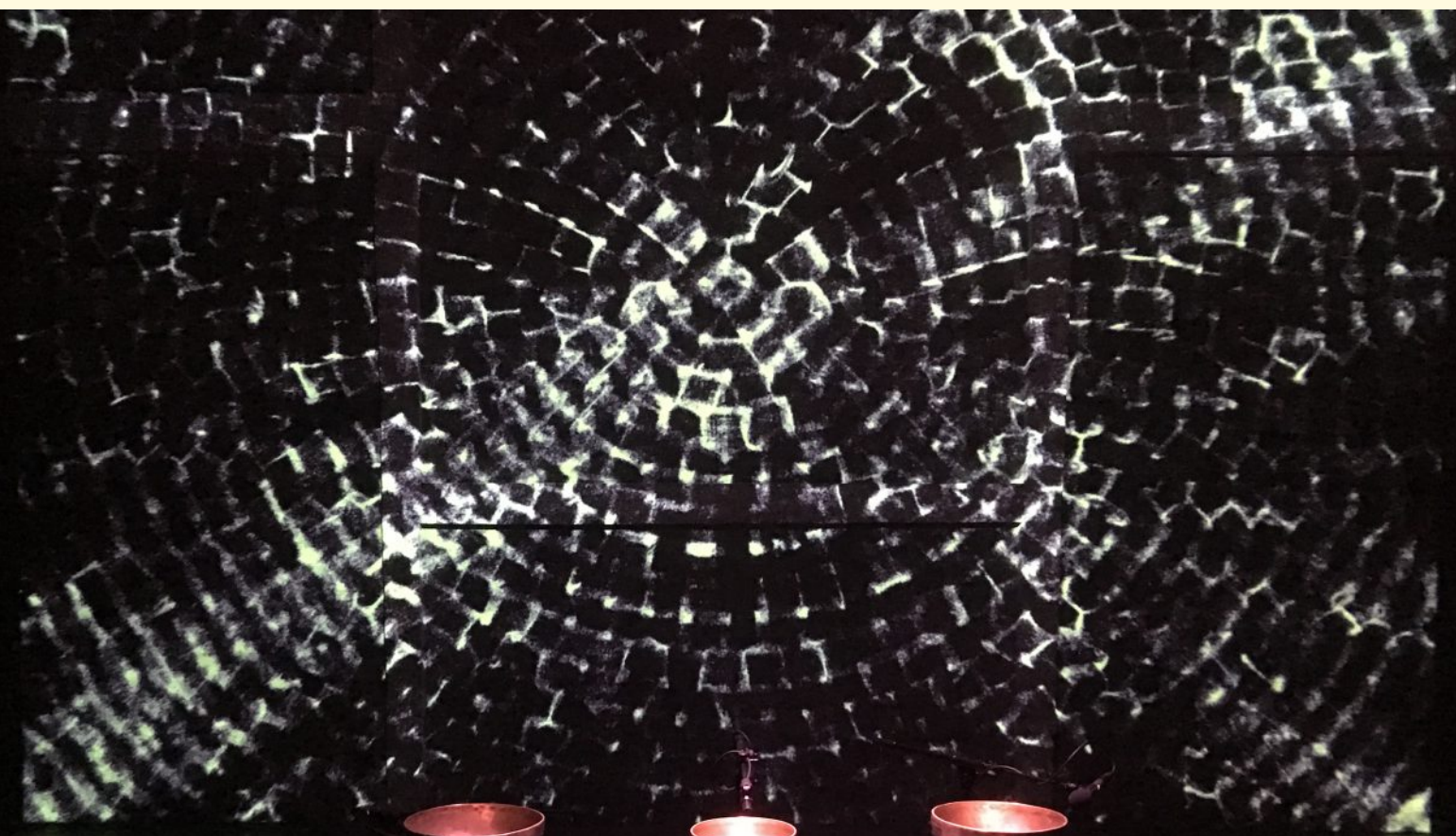
Creative AI

- Interaction and Performance
- Image and Video Processing
- Meta-art

Expressive Performance

- Classifying Inputs/Gestures/Sounds & mapping them to artistic outputs
- Rebecca Fiebrink, Wekinator
- Kima by Analema Group, based in London
 - Synaesthetic mapping of voice to image





Expressive Performance

Google's Magenta

- Piano Duets; Idea generators; Musical interfaces
- Explore the use of ML as a means to generate new ideas, and they build collaborative prototypes that you can perform or compose with
- Make musical plugins for Ableton and other audio creation programs

×

CONTINUEEEEEEE

Drums

Melody

Input Clip

Choose Track

Choose Clip

Variations

4

Length

2 Bars

Temperature

1.0

Generate

×

GROOVAAE

Drums

Input Clip

Choose Track

Choose Clip

Temperature

1.0

Generate

×

GENERATE 4 BARS

Drums

Melody

Output Location

Choose Track

Choose Clip

Variations

8

Temperature

1.0

Generate

×

INTTERRPPOLLAATE

Drums

Melody

Input Clips

Choose Track

Choose Clip A

Choose Clip B

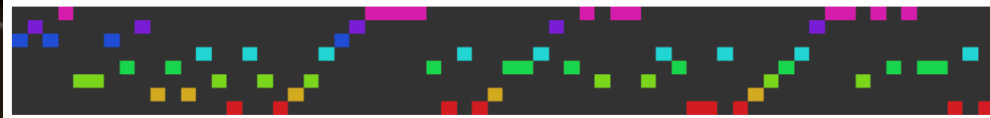
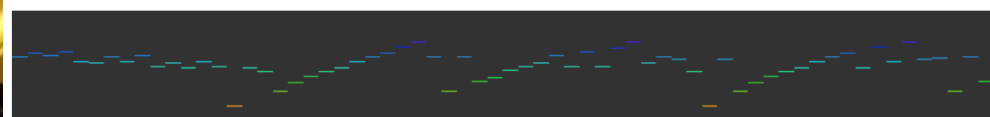
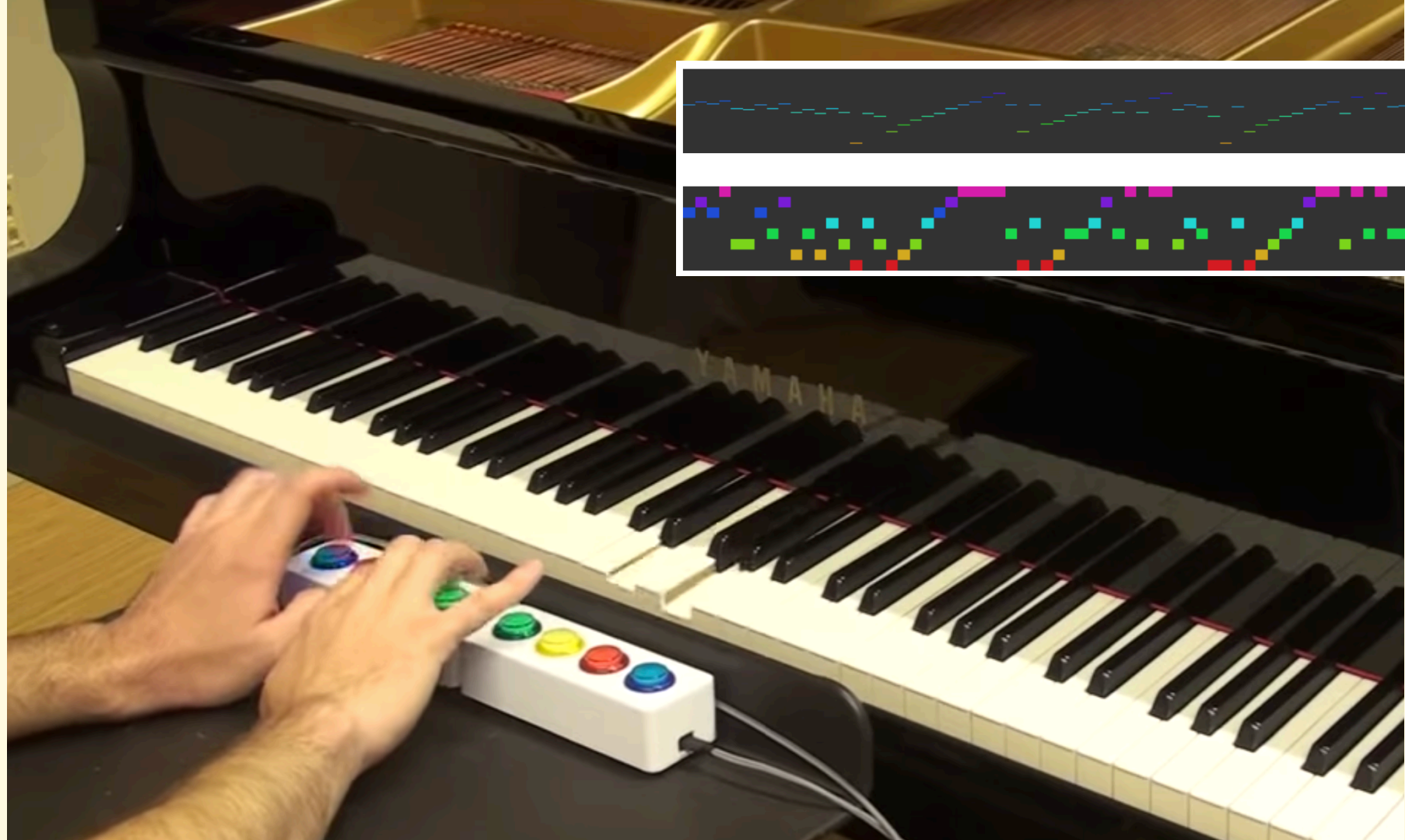
Steps

3

Temperature

1.0

Generate



Deep Dream

- Originally developed as a way to identify which features were used to classify an image
- Accentuates the feature, blending it back into the image so that it increases the confidence of a particular output neuron
- Can be repeated, with surreal results...



Computed Curation

- Philipp Schmitt's project to use ML algorithms to automatically title and arrange a book of photographs

a bench sits on a beach [confidence: 6.52776043656966%]

New York City, USA. October 2016.



walkway, boardwalk, sea, winter, vehicle, pier, coast, snow, ocean, dock

a train that is on a grassy hill
[confidence: 22.4423426698951%]

Helagsfjället, Sweden. August 2014.



highland, mountainous landforms, mountain, atmospheric phenomenon, hill, building, field, rural area, farm, landscape

a crowd of people watching a large umbrella
[confidence: 67.6608493624627%]

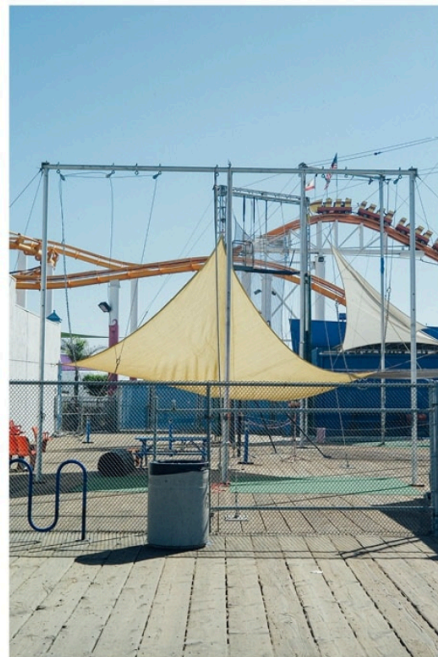
Berlin, Germany, August 2014.



crowd, people, spring, festival, tradition

a yellow boat sitting on top of a bridge
[confidence: 18.754580435873%]

Los Angeles, USA, October 2016.



vehicle, ship, sea, sailing ship, mast, watercraft, tall ship,
walkway, dock, pier

Learning ideal images

- Tom White, "Synthetic Abstractions"
- Trains a NN to generate images that will maximize being classified as belonging to a certain category across multiple NN architectures used to classify images (imageNet, inception, resNet, etc).
- Results in examples of "ideal" objects, as learned from a labeled set of data
- The resulting image scores higher than any real image from the training set





Evolution or Rupture?

- Deep learning networks learn from data that already exists, and classify input in terms of categories that are already defined.
- Style transfer algorithms identify features in artworks, but ignore the fact that they must be perceived, and do not model how or why an artwork is interpreted.

Evolution or Rupture?

- Media artists, in addition to using new media forms to create new representations and new experiences, also investigate the nature of media itself, and foreground concept over aesthetics and technical craftsmanship.
- Can we create models that learn to encode and/or generate conceptual art? And that reason about the relationship of concept to material?

Resolution

What is left out of machine generated representations? (style transfer, gans, etc)?

Exercise for students in graphics class – recreate an abstract painting – half the class chooses Mondrian, thinking it will be easy. But even the most successful versions aren't successful...

Resolution

Why not? For many reasons

How to encode form, composition, design, layout?

Paintings are three dimensional, textural, much more difficult to account for brush strokes, subtleties in color, etc.

Inferring

To speculate means to ponder, to consider, to infer, in media arts, often used in the context of considering the future effect of technology.

Etymological roots from the Latin *specere* ("to look") and *specula* ("watchtower").





Style transfer

- Leon Gatys' style transfer:
<http://bethgelab.org/publications/leon+gatys/>
- Style transfer is successful at learning (some) features that we can't explain clearly– non-ML algorithms are less successful at describing subtleties of image
- Could an ML technique learn how to block a shot? How to light a scene? How to edit a film? How to write a script? Learn a director's style?

Drifting through latent space

- Faces, paintings
- https://twitter.com/darren_cullen/status/1060225126313156613 (Darren Cullen)
- <https://twitter.com/genekogan/status/1058759055056035840> (Gene Kogan)

Creative intelligence

Many interesting questions:

- How do you define an artist's style? (even with Neural Style Transfer - disconnect between implementation and understanding)
- How does a photographer compose a scene?
- How do authors present material to make it the most engaging?





