Computational Media Research
CMPM 202, W2020

Week 5, Thursday: Creative AI

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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
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%]

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


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

highland, mountainous landforms, mountain, atmospheric phenomenon, hill, building, field, rural area, farm, landscape
a crowd of people watching a large umbrella
[confidence: 67.6608493624627%]

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

crowd, people, spring, festival, tradition

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?