

Computational Media Research

CMPM 202, W2019

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Reading Responses

Find something that you disagree about...

- What is art? How is it different now than 10 years ago? What will it be in another 10 years?
- Is there a fundamental difference between previous technologies and ML in terms of art making potential?
- Even given unlimited data from increasingly varied sensors, will some forms of intelligence resist computability? Why or why not?

Creative AI

NeurIPS Workshop on ML for Creativity and Design

IEEE VIS Arts Program

SIGGRAPH Arts Gallery and Arts Papers

ACM/EG Expressive

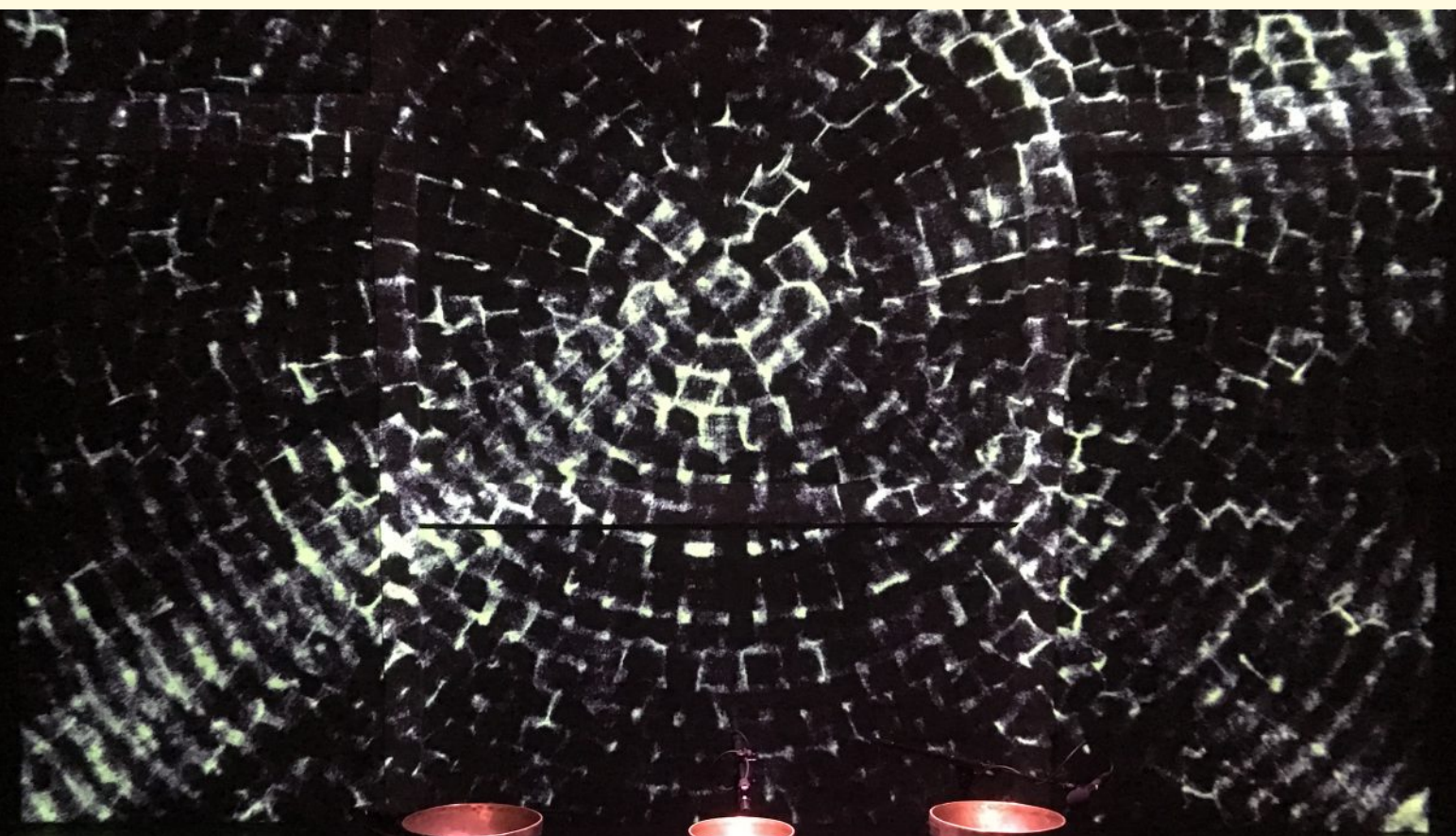
FDG Workshop on Procedural Content Generation

- Performance & Interaction
- Image / Sound / Text 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

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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

×

INTTERRPOOLLAATE

Drums

Melody

Input Clips

Choose Track

Choose Clip A

Choose Clip B

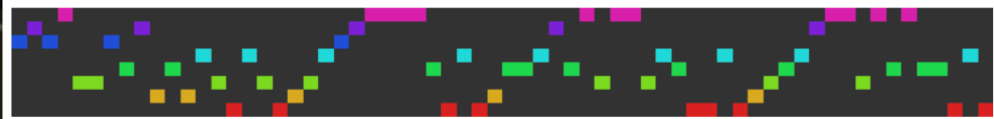
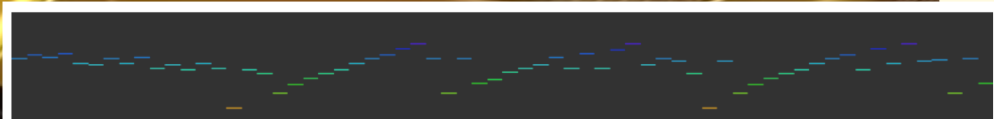
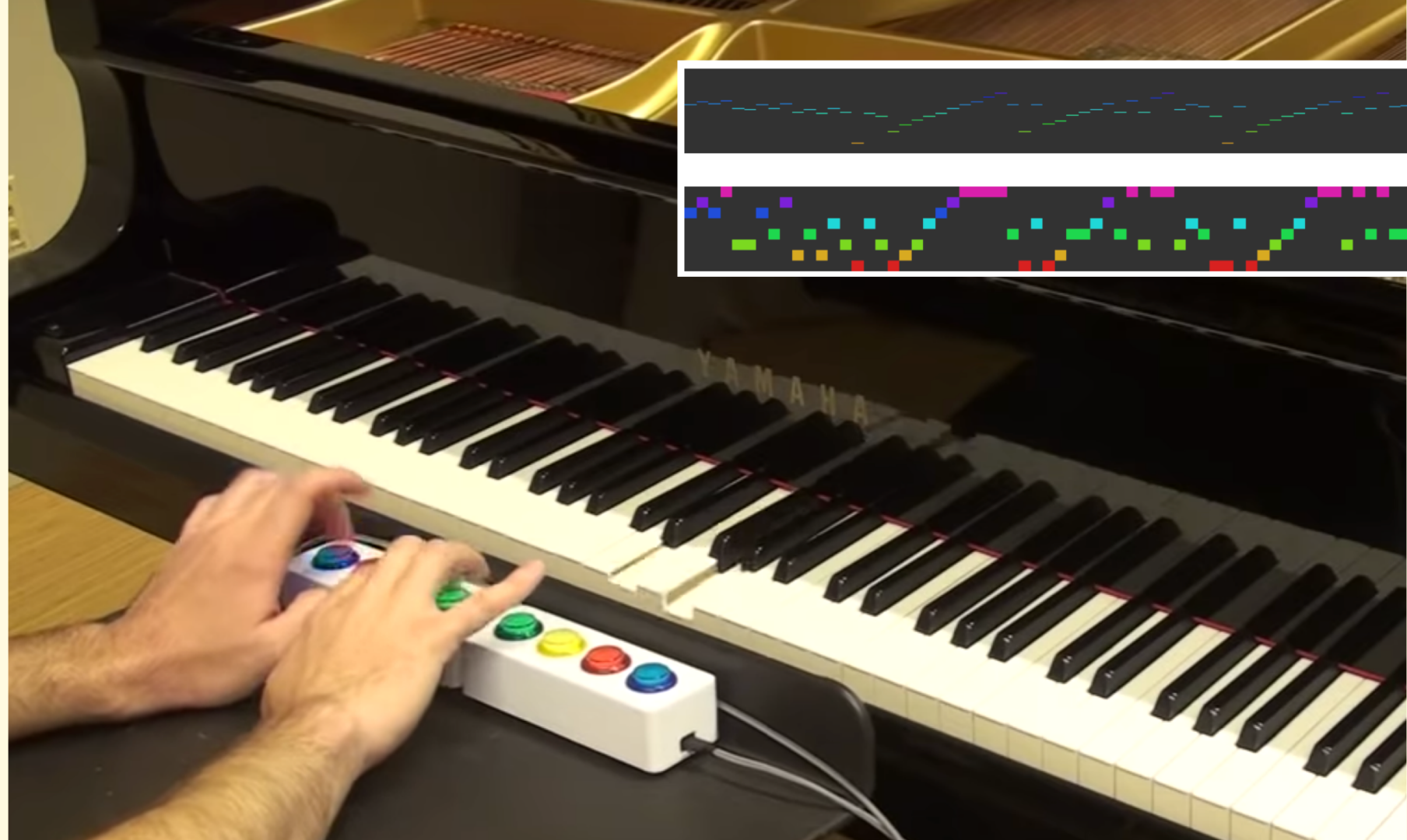
Steps

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.

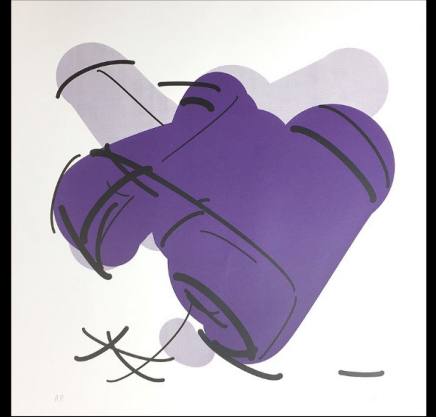
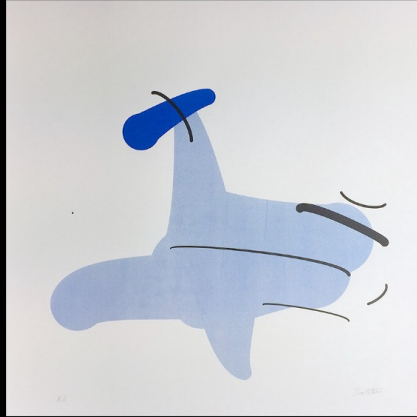
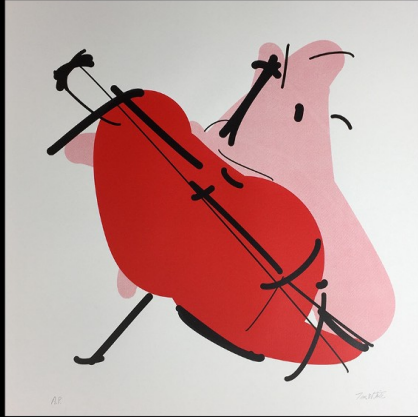


vehicle, ship, sea, sailing ship, mast, watercraft, tall ship,
walkway, dock, pier

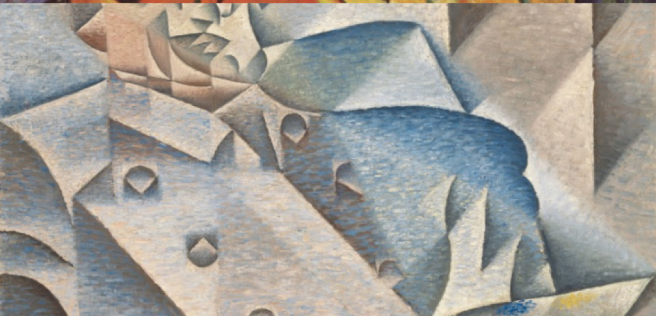
Learning ideal images

- 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









Style Transfer

- Gatys, "A neural algorithm of artistic style" (2015)
- Ruder et al., "Artistic style transfer for videos" (2016)
- Huang et al., "Real-time neural style transfer for videos" (2017)
- Chen et al., "Stereoscopic neural style transfer" (2018)

A



B



C



D



E



F



Original frames



Style image



Independent per-frame processing



Processing with our temporal constraint



- Karras et al., "A style-based generator architecture for Generative Adversarial Networks" (2018)



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 - disconnect between implementation and understanding)
- How does a photographer compose a scene?
- How do authors present material to make it the most engaging?

Swarm Vision, George Legrady



Creative intelligence

- Huge opportunities for applying deep learning to ask questions like this, which could have practical applications and perhaps will help us learn more about our own creativity.
- Not to replace artists or designers or musicians, but to augment or invent creative processes

Homework

Remember!

- Project 1 due Thursday 1/17, short presentation = ~3 minutes per group, show your output of the WFC algorithm. If possible, please have your entire demo within the Readme of your github repo and send me the link before class

Next class:

- Reading Responses + Homework for week 3 will be assigned on 1/17
- Introduction to TensorFlow
- Installation, where to find tutorials
- Classifying numbers with a CNN