Digital Humanities

Lecture 8

April 7

2025

Mario Verdicchio


Tim Berners-Lee has proposed the idea of enriching the Web with techniques for automatic treatment of meaning. A new Web, a Web 2.0, a Semantic Web.

A computer only processes signs syntactically.

We want a computer to handle semantics as well.

There must be a way to express semantics syntactically, to express meaning with signs.

Semantic Web

“Web 2.0” was originally meant to refer to the Semantic Web.

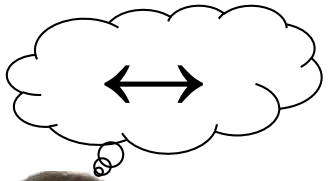
A radically new version (2.0) of the Web was to be born, enhanced with techniques for the automatic treatment of meaning.

Versioning: dealing with different versions of a product.

1.0 = initial release, first version
1.1
1.2 } **following versions with small changes**
…
2.0 = new version with significant changes
2.1
…

Semantic Web: the basic idea

Instead of relying only on the mind of the Web user to create the link between text and entities, that is, between syntax and semantics ...



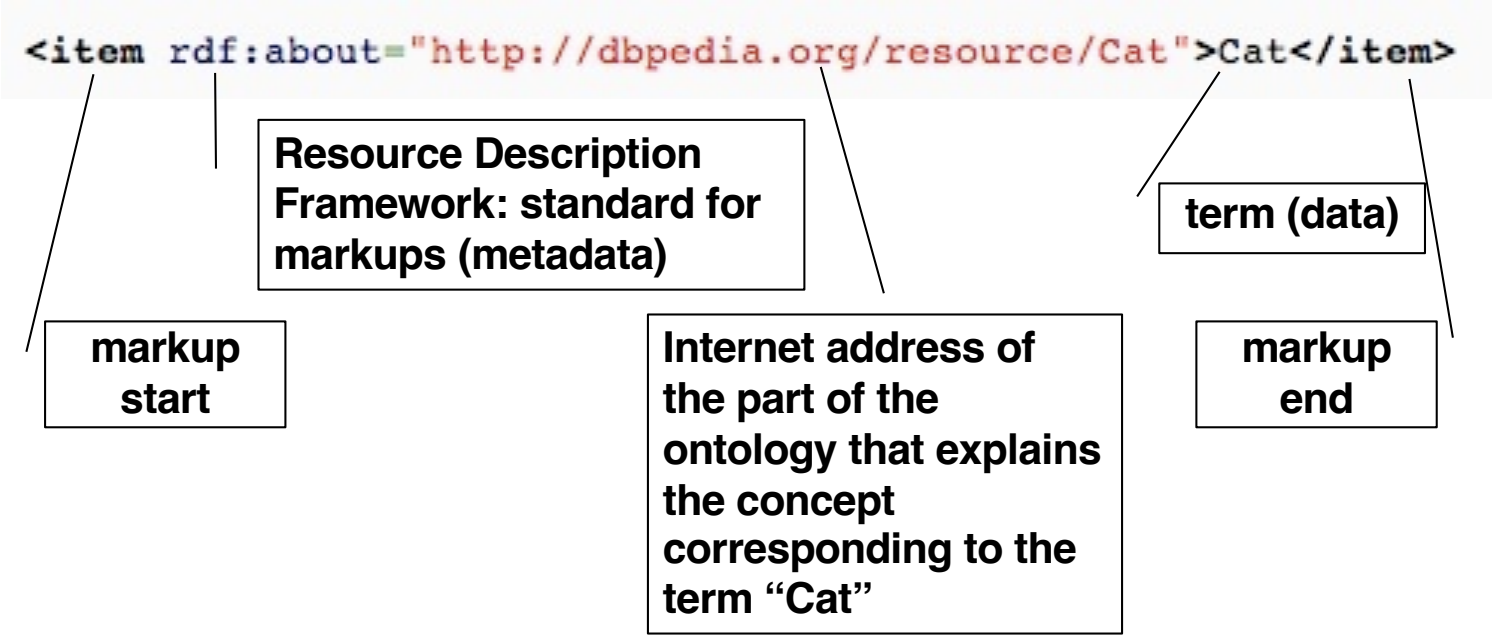
`Cat`

entity in the world

sequence of characters

Semantic Web: the basic idea

... use extra symbols, in the form of markups (metadata), that refer to an ontology (a shared document that is similar to a vocabulary, with an additional organization of concepts in hierarchies).



Resource Description Framework

It is a standard that prescribes the way in which the data we work with must be described, that is, it provides information on metadata: data about data.

```
<item rdf:about="http://dbpedia.org/resource/Cat">Cat</item>
```

Resource Description Framework: standard for markups (metadata)

Obviously, like all agreements that aim at becoming a standard, RDF must be accepted and followed by all Web content creators in order to function. Just like ASCII, RGB, JPG, MP3, etc.

Semantic Web: problem #1

All Web users must follow a single convention on how to describe data on the Web. RDF is a proposal, but it has not been universally accepted.

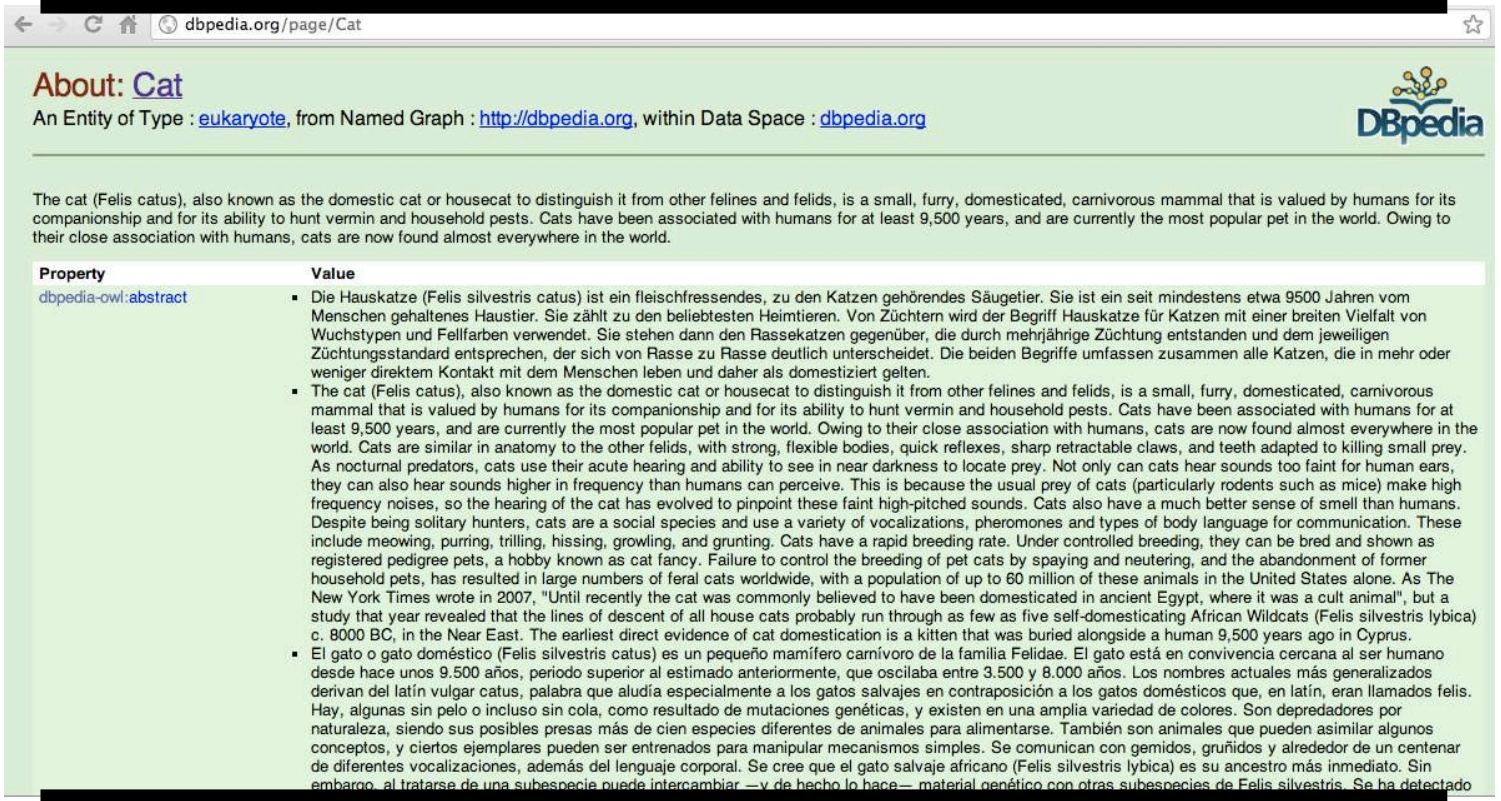
Ontology

An ontology is meant to define all the concepts belonging to a particular domain, and to list all the possible relationships between them.

```
<item rdf:about="http://dbpedia.org/resource/Cat">Cat</item>
```

Internet address of the part of the ontology that explains the concept corresponding to the term “Cat”

If we go to dbpedia.org/resource/Cat we find this description, in several languages.



The description includes several ways of referring to a cat in different languages, as well as a phylogenetic tree.

Semantic Web: problem #2

For each existing concept, all Web users must agree on the ontology that describes it. DBpedia is a proposal, but it has not been universally accepted.

Semantic Web: problem #3

The chicken or the egg.

The "chicken or the egg problem" refers to a stalemate. In the case of the hen and the egg, the question arises as follows: without the egg, the hen cannot be born, but without a hen, an egg cannot be made.

As far as the semantic web is concerned, the issue is about the daunting work required to create ontologies for all the concepts and label all data in existing and future Web pages with semantic markups that refer to those ontologies.

Why can't we make computers do that job?

What does «cat» mean?

For the computer to use the markup of «cat» and show the user a photo of a cat (for example), the markup must already be there.

For the markup of «cat» to be there, an agent must have understanding of the meaning of «cat» and have associated it with the right entry in the ontology.

That agent cannot be a computer, because such task requires understanding of meaning, and without a semantic markup a computer cannot do anything. That agent must be a human.

Computers could do the job, if the job were already done. To kickstart the job, we need an agent that knows that “cat” means 

Why can’t we make computers do that job?

The “chicken or the egg problem” refers to a stalemate. In the case of the hen and the egg, the question arises as follows: without the egg, the hen cannot be born, but without a hen, an egg cannot be made.

As far as the semantic web is concerned, the issue is about the daunting work required to label all concepts present in existing and future Web pages with semantic markups. Such work clearly cannot be automated, because it assumes that computers already know the meaning of words.

When it comes to Semantic Web, therefore, the “chicken or the egg problem” describes the following stalemate: no Web content producer wants to start the titanic enterprise of marking Web pages up if he/she is not sure that the Semantic Web will really become a thing. However, for the Semantic Web to really happen, everyone has to markup the content they publish.

Result:

The term “Web 2.0” has been recycled to refer to the Social Web.

The Semantic Web is now known as “Web 3.0”, and we don’t know whether it will ever happen.

The Digital in Digital Art

News from 2018

- Artificial-Intelligence-based artwork to be auctioned at Christie's

"Edmond de Belamy, from La Famille de Belamy" by the French collective Obvious

Reactions

Reactions

Reactions

- “The technology used to create the work, has been used by artists since around 2015. This group is totally irrelevant.”
  - Ahmed Elgammal, Director of the Art and Artificial Intelligence Laboratory at Rutgers University
- “When I saw that announcement of the auction, my reaction was ‘you can’t be serious.’ The portrait by Obvious is connect-the-dots children’s painting.”
  - Mario Klingemann, German artist and artist-in-residence at Google Labs, Paris

since around 2015

totally irrelevant

Do 3 years make a technique irrelevant?

- Artificial Intelligence Technique used by Obvious: 3 years

Do 3 years make a technique irrelevant?

- Artificial Intelligence Technique used by Obvious: 3 years
- Computers: 70 years

1950. The United States Government receives the UNIVAC 1101. This computer is considered to be the first computer that was capable of storing and running a program from memory.

Do 3 years make a technique irrelevant?

- Artificial Intelligence Technique used by Obvious: 3 years
- Computers: 70 years
- Sculpture: 40,000 years

Löwenmensch, from Hohlenstein-Stadel,
now in Ulmer Museum, Ulm, Germany,
the oldest known anthropomorphic animal-human statuette,
Aurignacian era, c. 35–40,000 BP

Do 3 years make a technique irrelevant?

- Artificial Intelligence Technique used by Obvious: 3 years
- Computers: 70 years
- Sculpture: 40,000 years
- Painting: 42,000 years

Found in a cave on Spain's Costa del Sol, six paintings of seals are at least 42,000 years old and are the only known artistic images created by Neanderthal man.

A 3-year-old iPhone

iPhone 13 (2021)

Reactions

Reactions

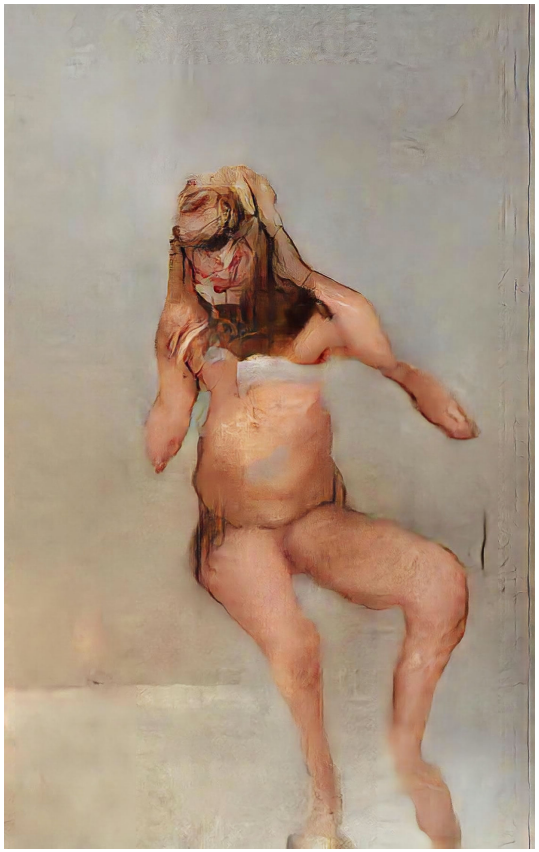
Do 3 years make a technique irrelevant?

- Artificial Intelligence Technique used by Obvious: 3 years
- Computers: 70 years

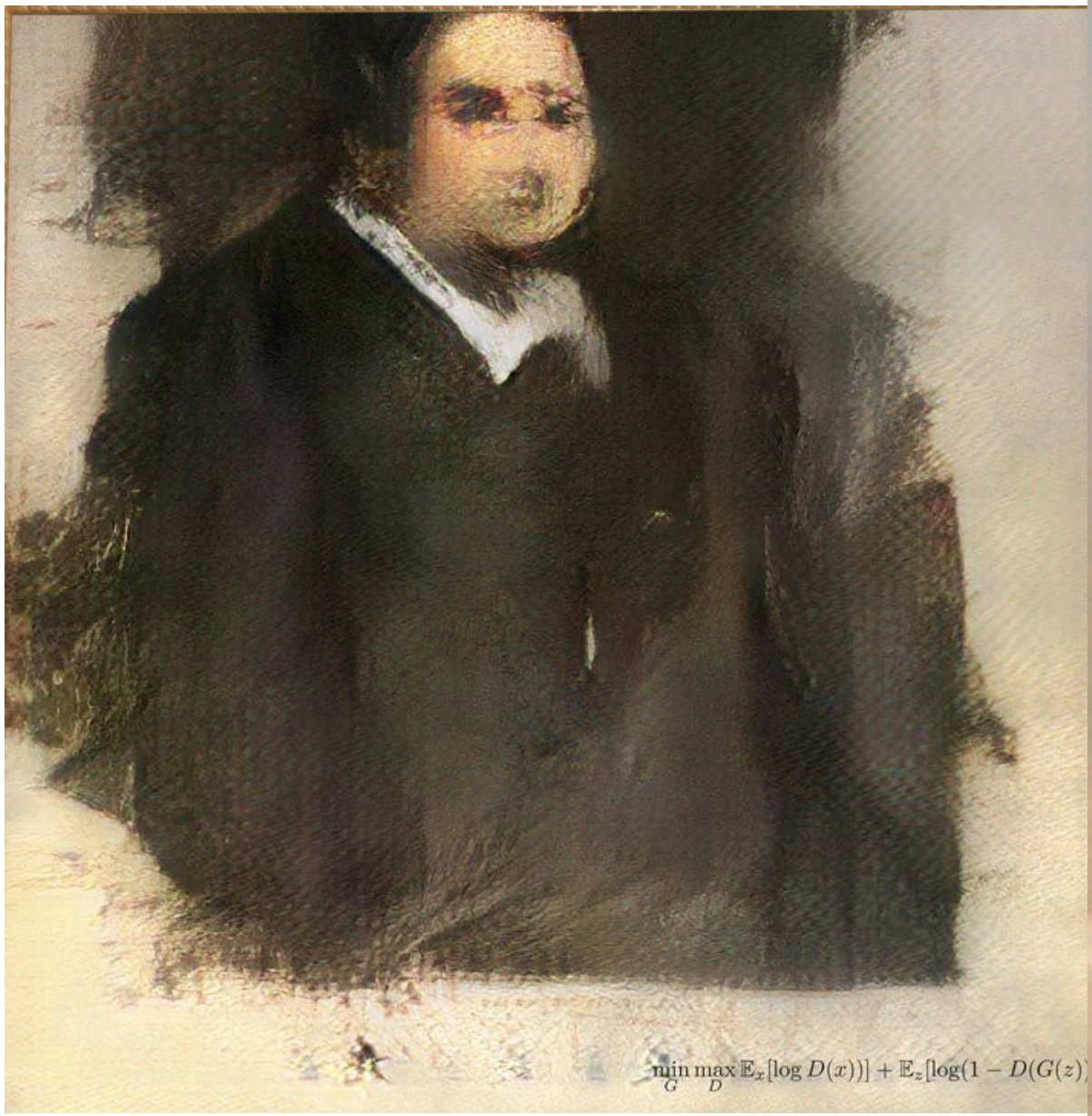
The portrait by Obvious is connect-the-dots children’s painting.

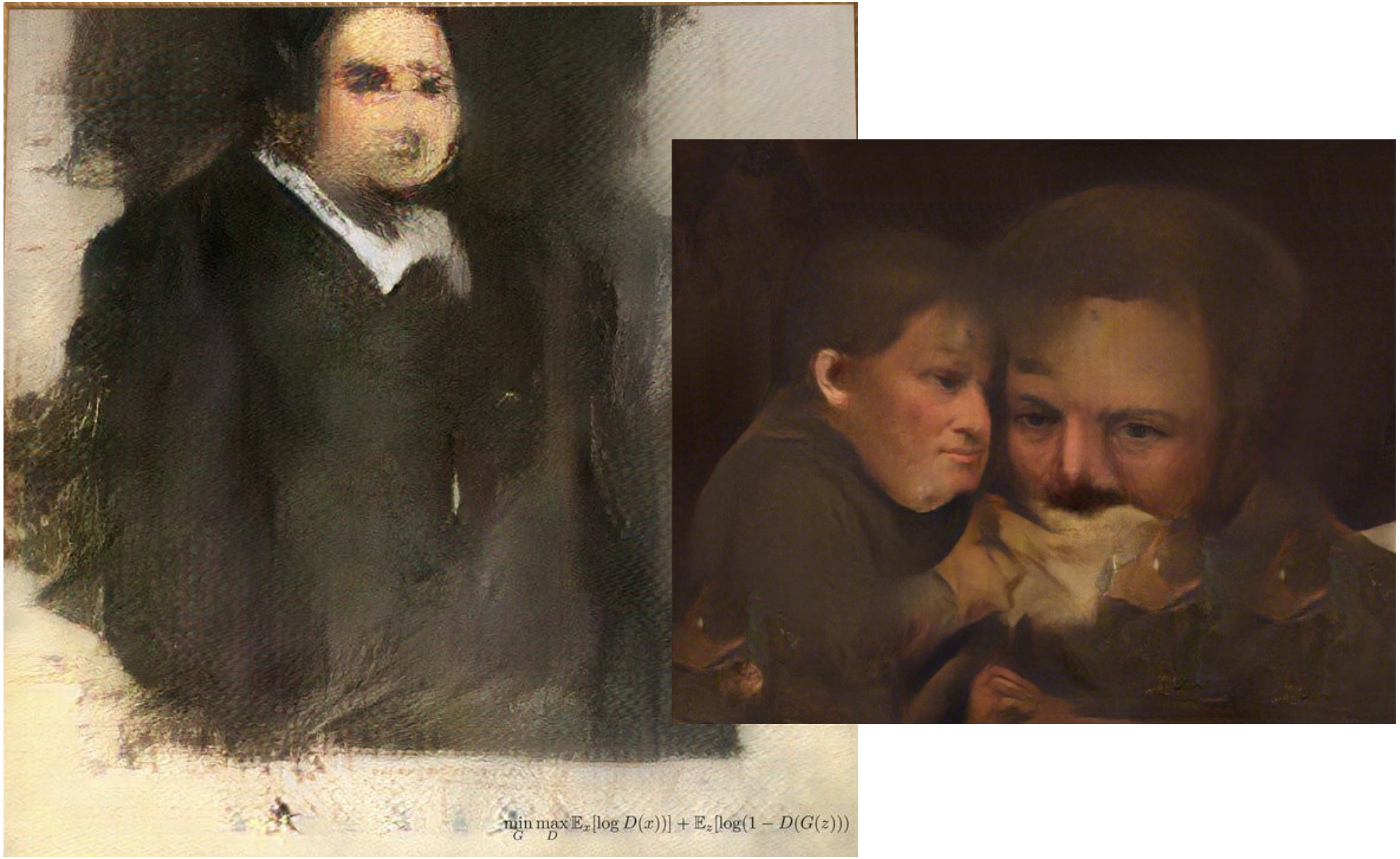
Obvious

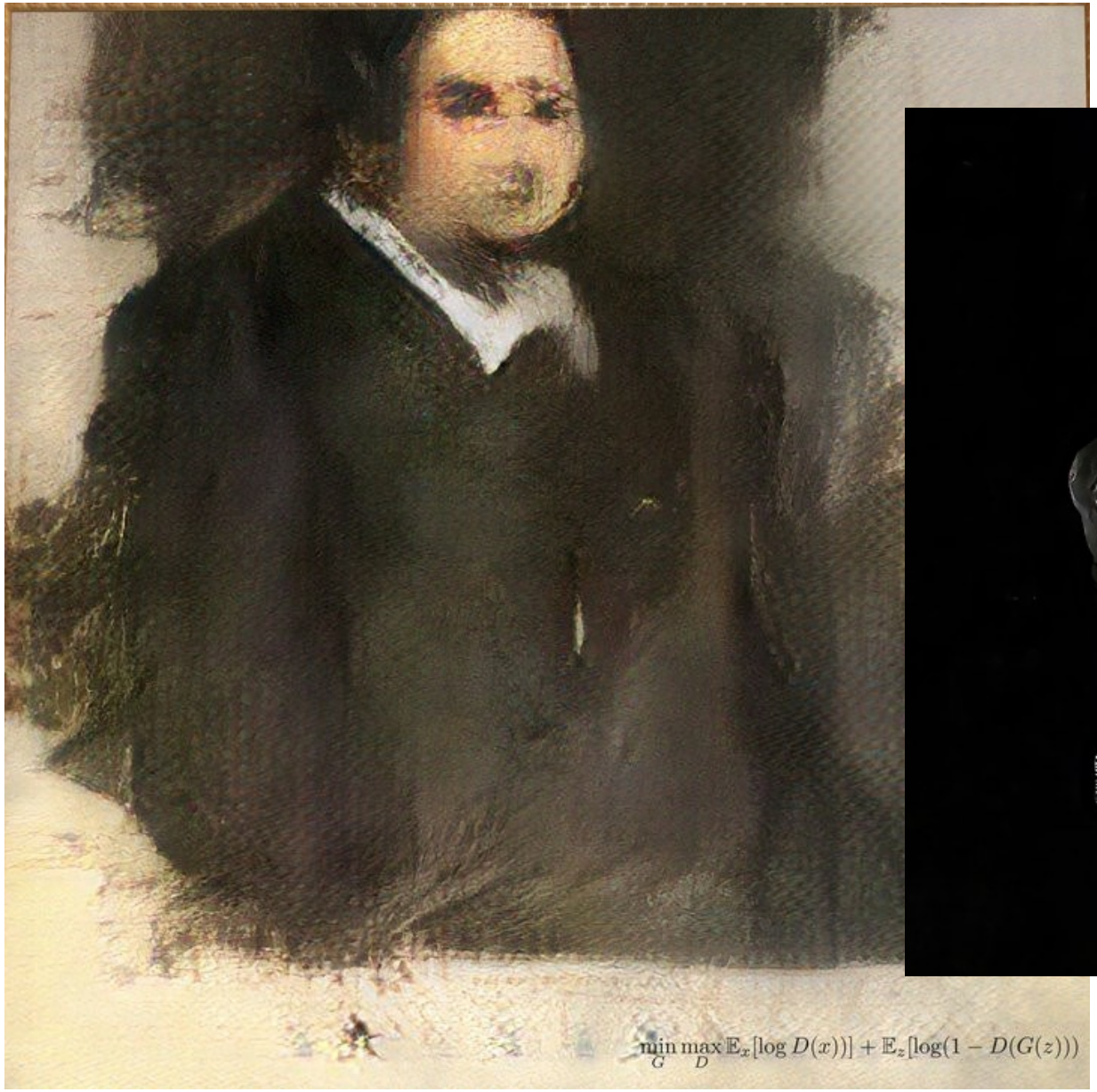
Obvious

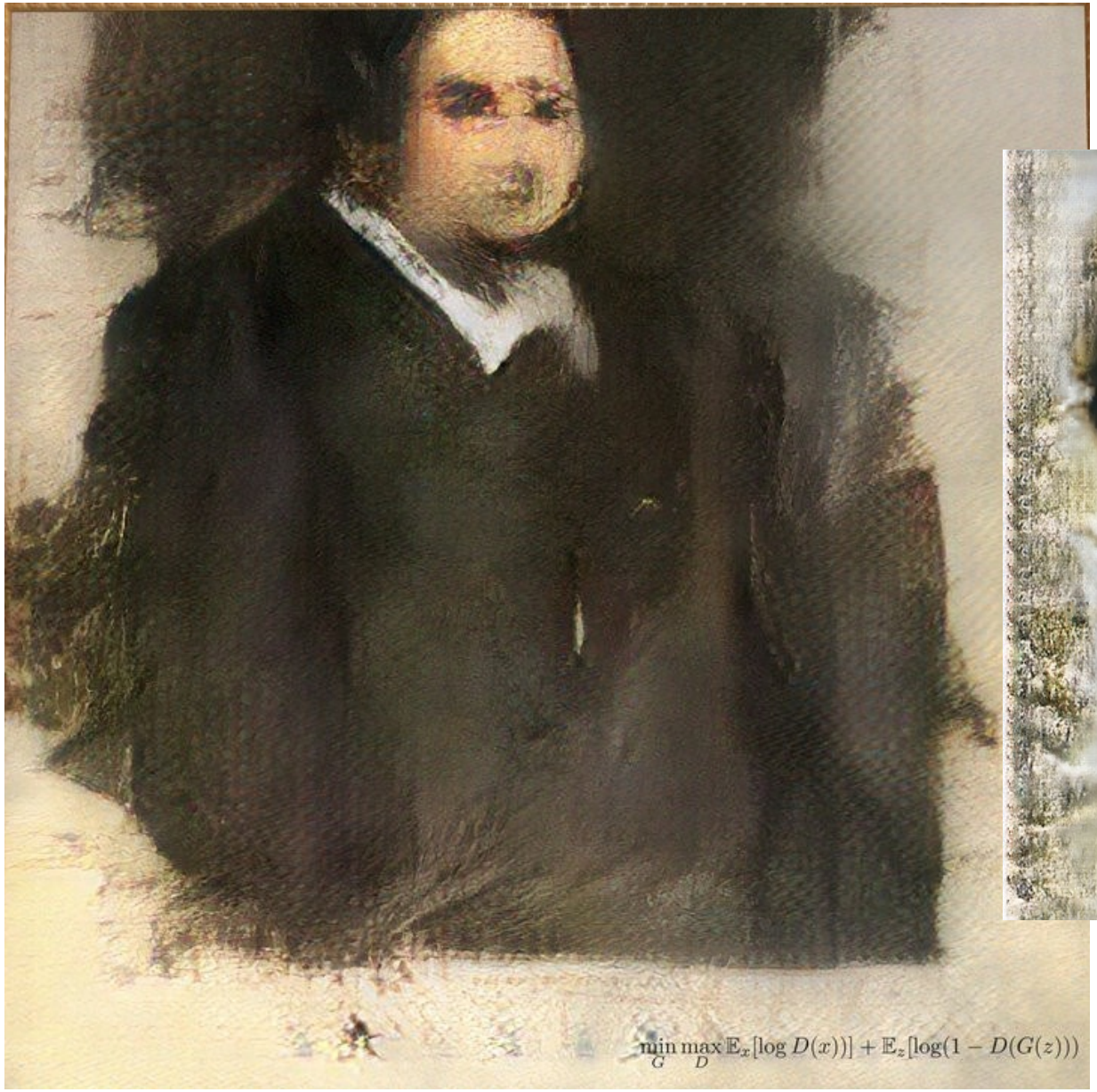


Mario Klingemann


$\min_G \max_D \mathbb{E}_x[\log D(x))] + \mathbb{E}_z[\log(1 - D(G(z)$


$\min_G \max_D \mathbb{E}_x[\log D(x))] + \mathbb{E}_z[\log(1 - D(G(z)))$


$\min_G \max_D \mathbb{E}_x[\log D(x))] + \mathbb{E}_z[\log(1 - D(G(z)))$


$\min_G \max_D \mathbb{E}_x[\log D(x)] + \mathbb{E}_z[\log(1 - D(G(z)))$

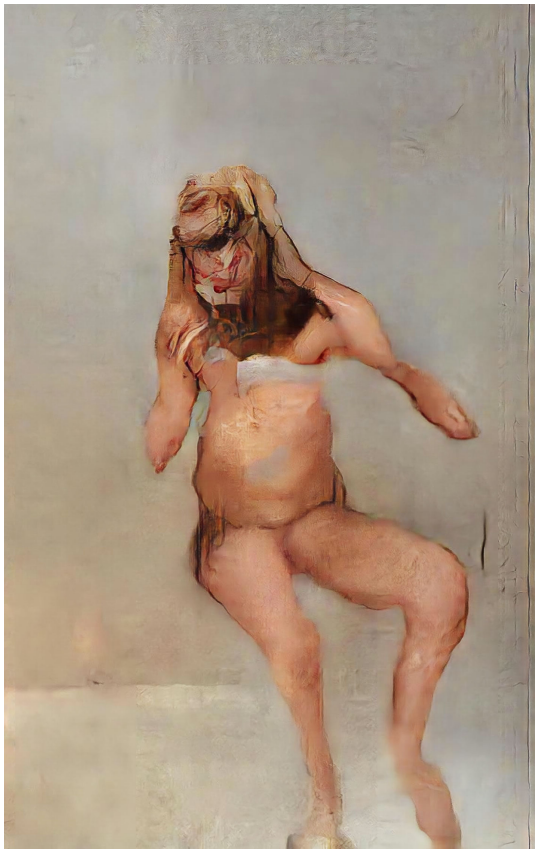
Christie's
@ChristiesInc

Follow

#AuctionUpdate The first AI artwork to be sold in a major auction achieves $432,500 after a bidding battle on the phones and via ChristiesLive bit.ly/2PVN2ly

Reactions

Obvious



Mario Klingemann

Obvious

THE LUMEN PRIZE

Mario Klingemann

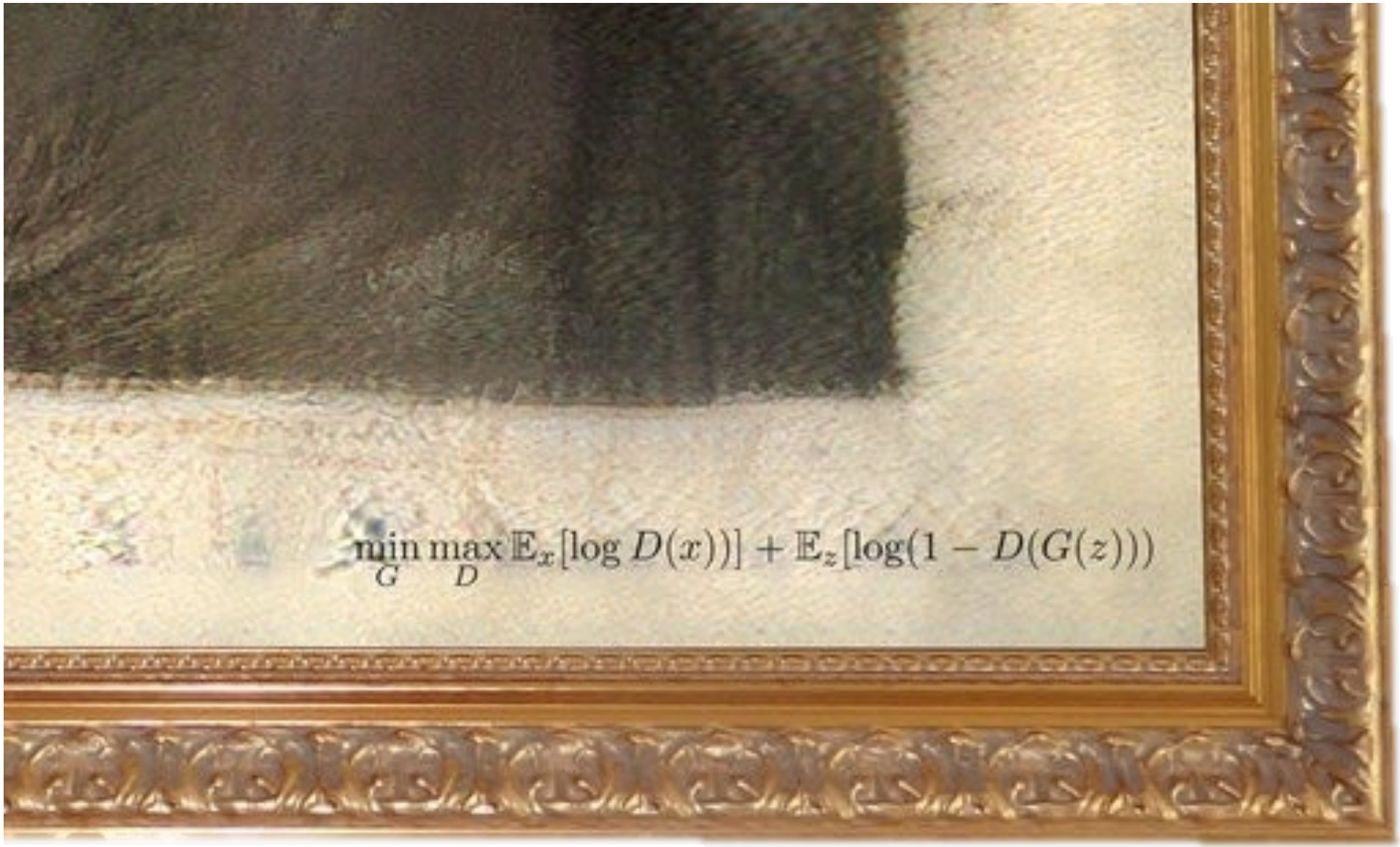
Obvious

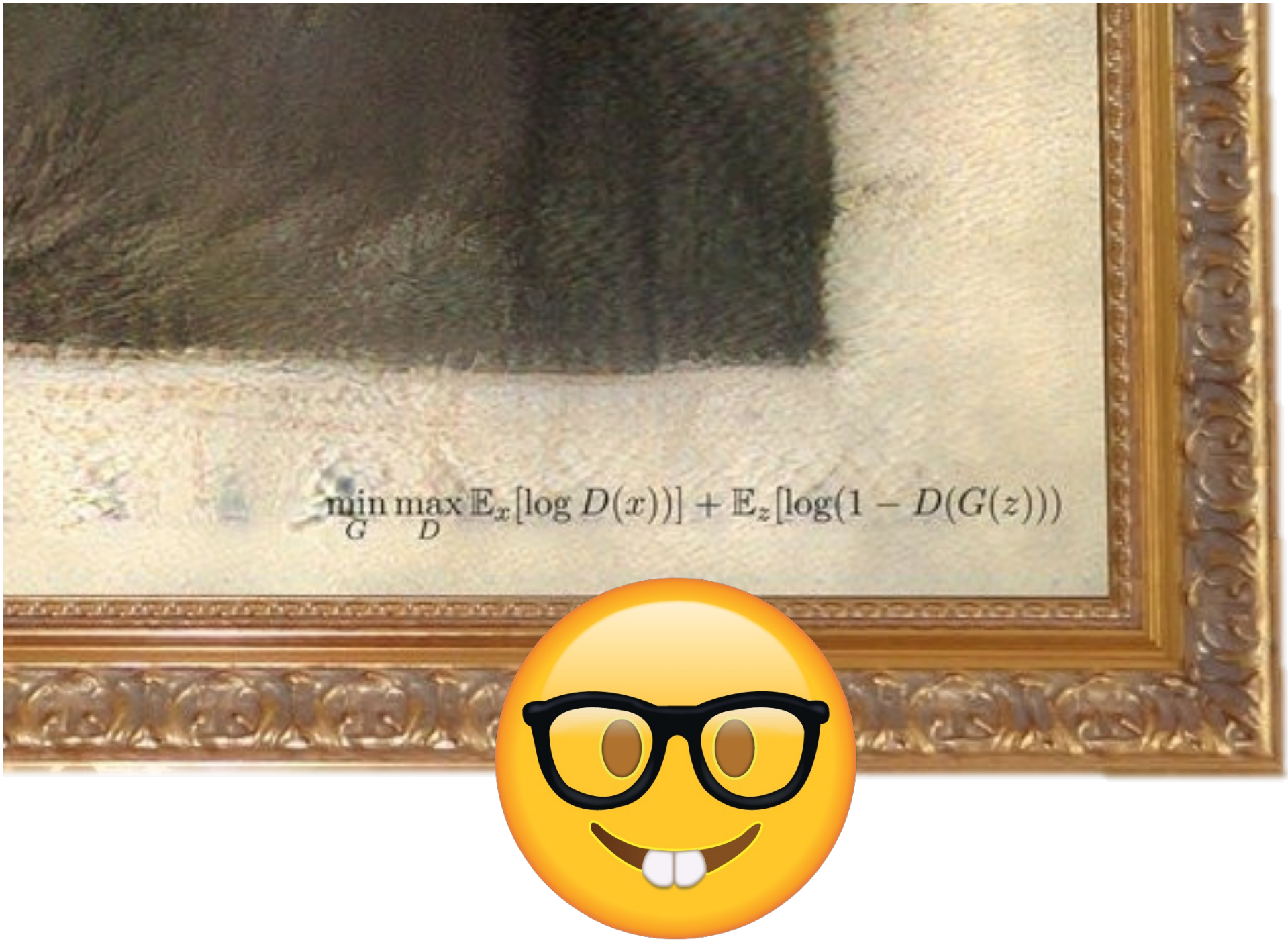
Mario Klingemann

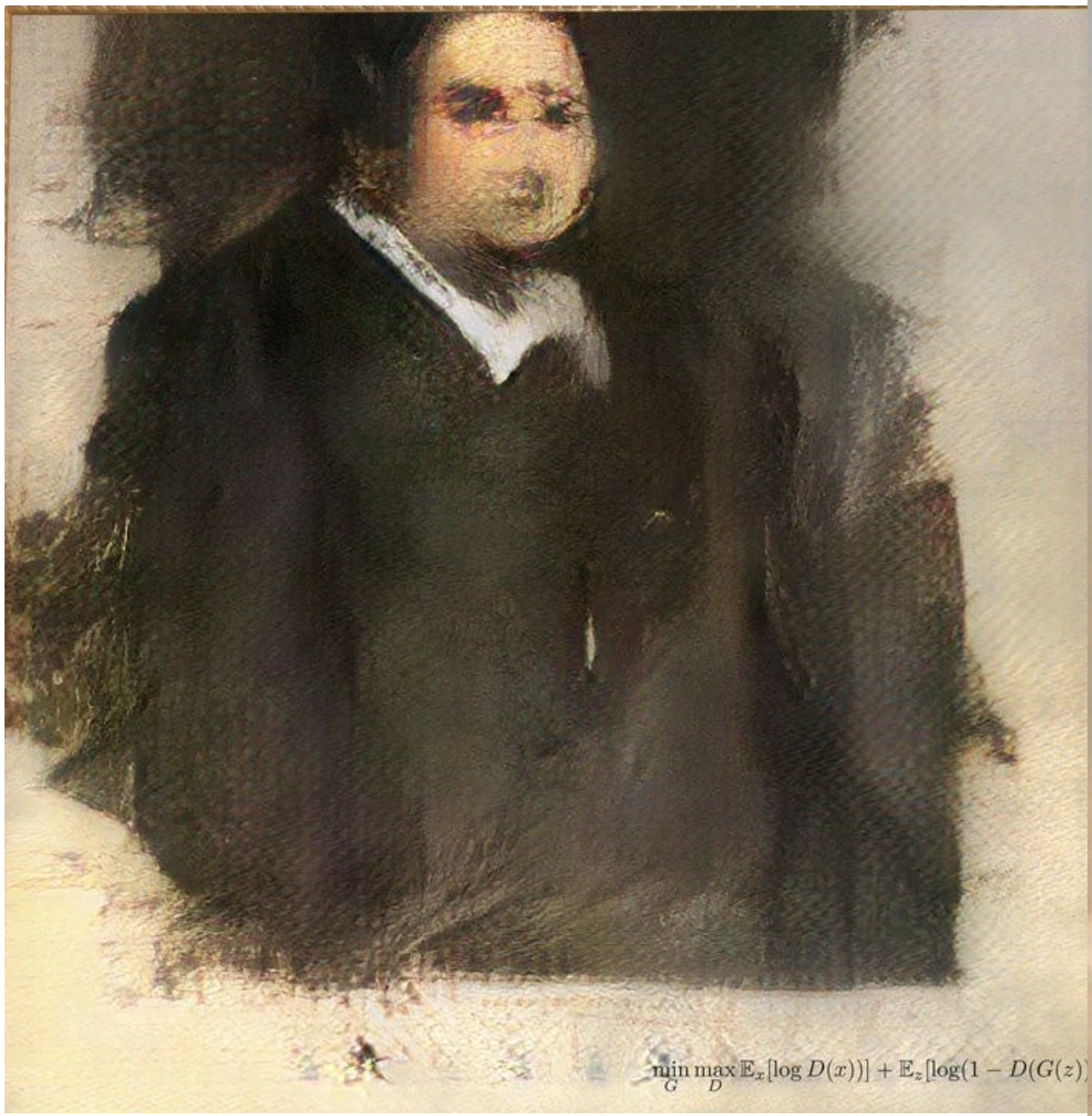
Mario Klingemann's process

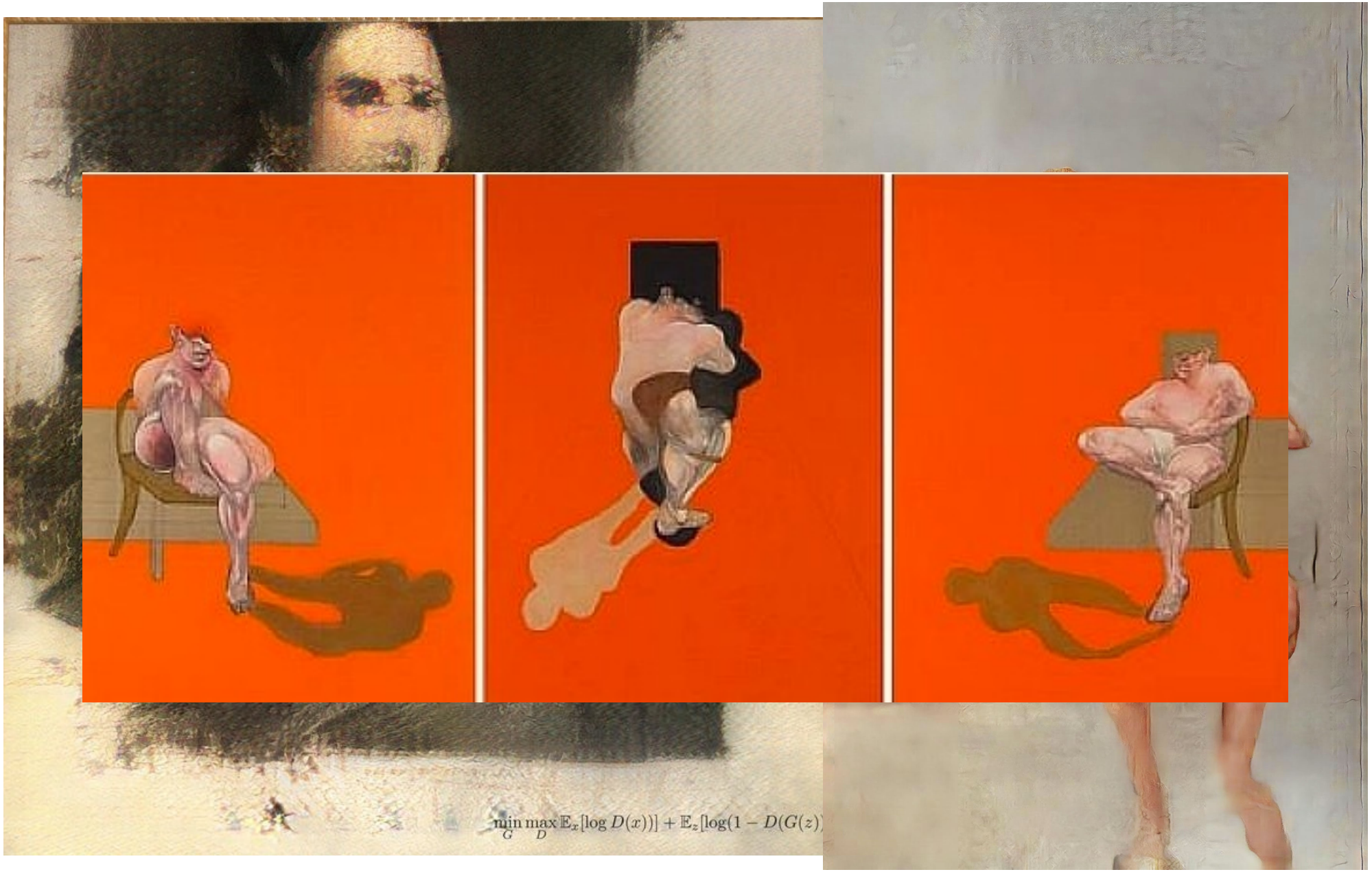
This image has been generated entirely by a machine using a chain of GANs (generative adversarial neural networks). In this chain a randomly generated stick-figure is used as an input to the first GAN, which produces a painterly-looking low-resolution proto-image. In several steps, the low resolution image is 'transhanced' and upscaled by another GAN increasing the resolution and adding details and textures. I control this process indirectly by training the model on selected data sets, the model's hyperparameters and eventually by making a curatorial choice, by picking among the thousands of variations produced by the models the one that speaks to me most.

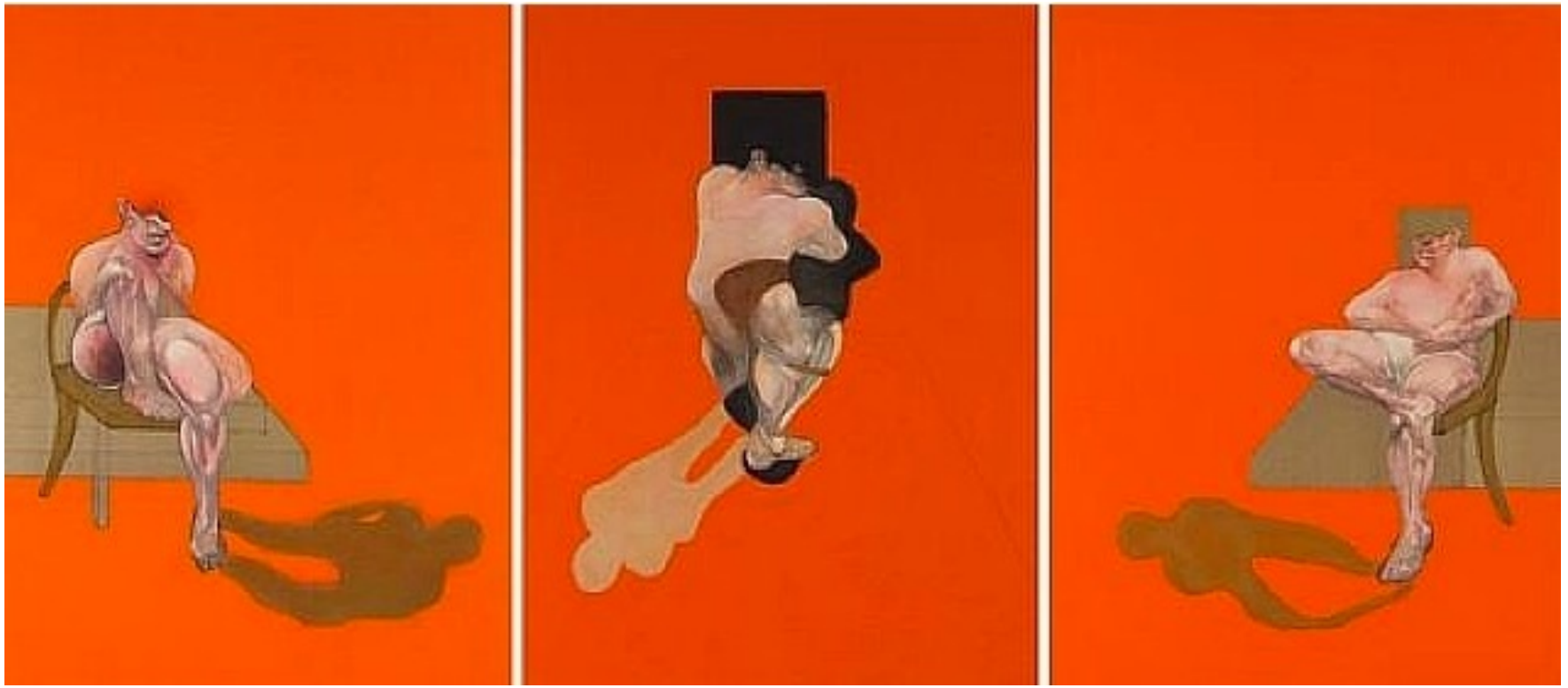

$\min_G \max_D \mathbb{E}_x[\log D(x)] + \mathbb{E}_z[\log(1 - D(G(z)))]$


$\min_G \max_D \mathbb{E}_x[\log D(x))] + \mathbb{E}_z[\log(1 - D(G(z)))$


$\min_G \max_D \mathbb{E}_x[\log D(x))] + \mathbb{E}_z[\log(1 - D(G(z)))$


$\min_G \max_D \mathbb{E}_x[\log D(x))] + \mathbb{E}_z[\log(1 - D(G(z)$


$\min_G \max_D \mathbb{E}_x[\log D(x)] + \mathbb{E}_z[\log(1 - D(G(z)$

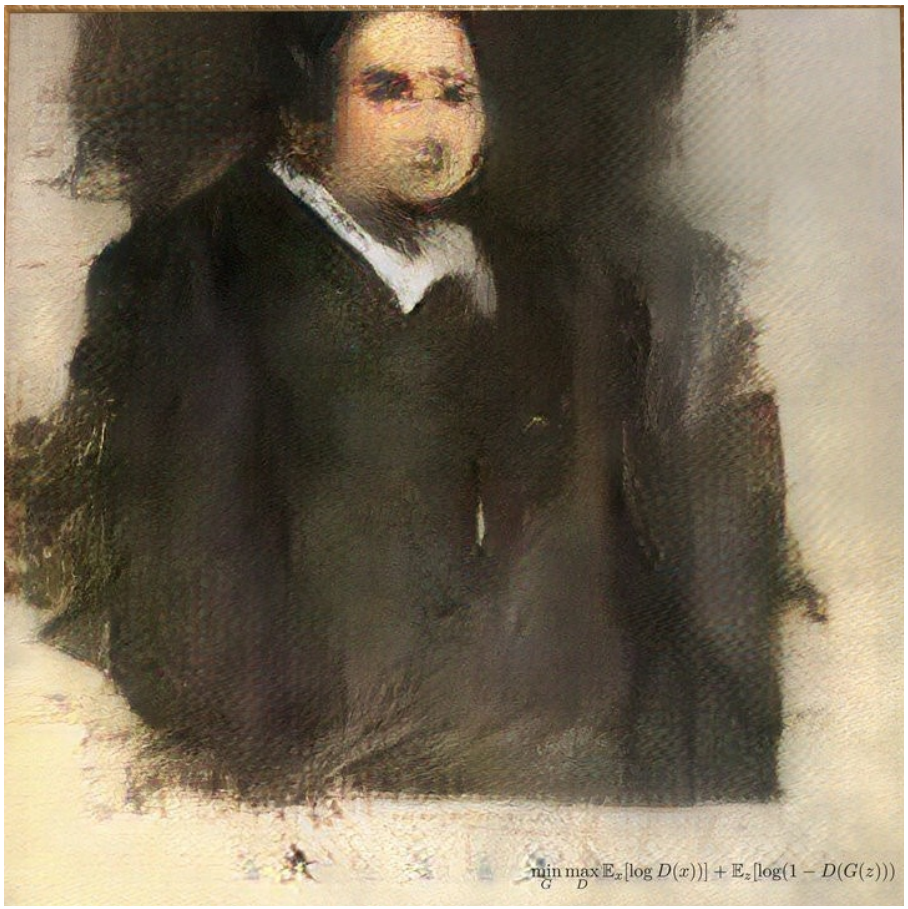


Francis Bacon, “Triptych”, 1983

Francis Bacon (1909-1992)

- Bacon was shy as a child and enjoyed dressing up. This, coupled with his effeminate manner, upset his father. A story emerged in 1992 of his father having had Francis horsewhipped by their grooms.
- At a fancy-dress party at home, Francis dressed as a flapper with an Eton crop, beaded dress, lipstick, high heels, and a long cigarette holder.
- In 1926, Francis was thrown out of the family home following an incident in which his father found him admiring himself in front of a large mirror draped in his mother's underwear.
- Bacon found himself drifting through London's homosexual underworld, aware that he was able to attract a certain type of rich man, something he was quick to take advantage of, having developed a taste for good food and wine.

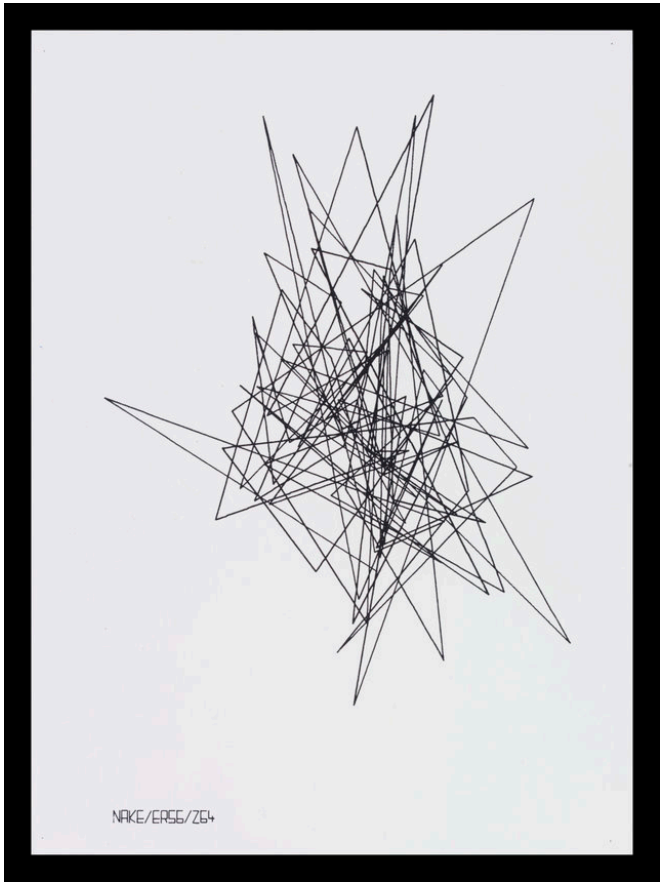
This image has been generated entirely by a machine using a chain of GANs (generative adversarial neural networks). In this chain a randomly generated stick-figure is used as an input to the first GAN, which produces a painterly-looking low-resolution proto-image. In several steps, the low resolution image is 'transhanced' and upscaled by another GAN increasing the resolution and adding details and textures. I control this process indirectly by training the model on selected data sets, the model's hyperparameters and eventually by making a curatorial choice, by picking among the thousands of variations produced by the models the one that speaks to me most.

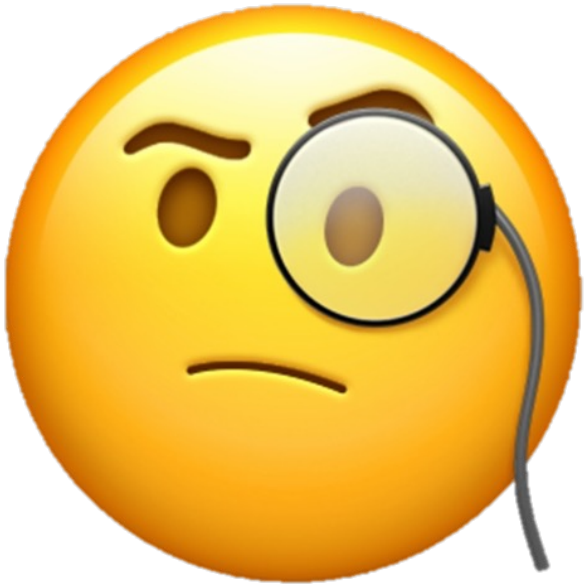


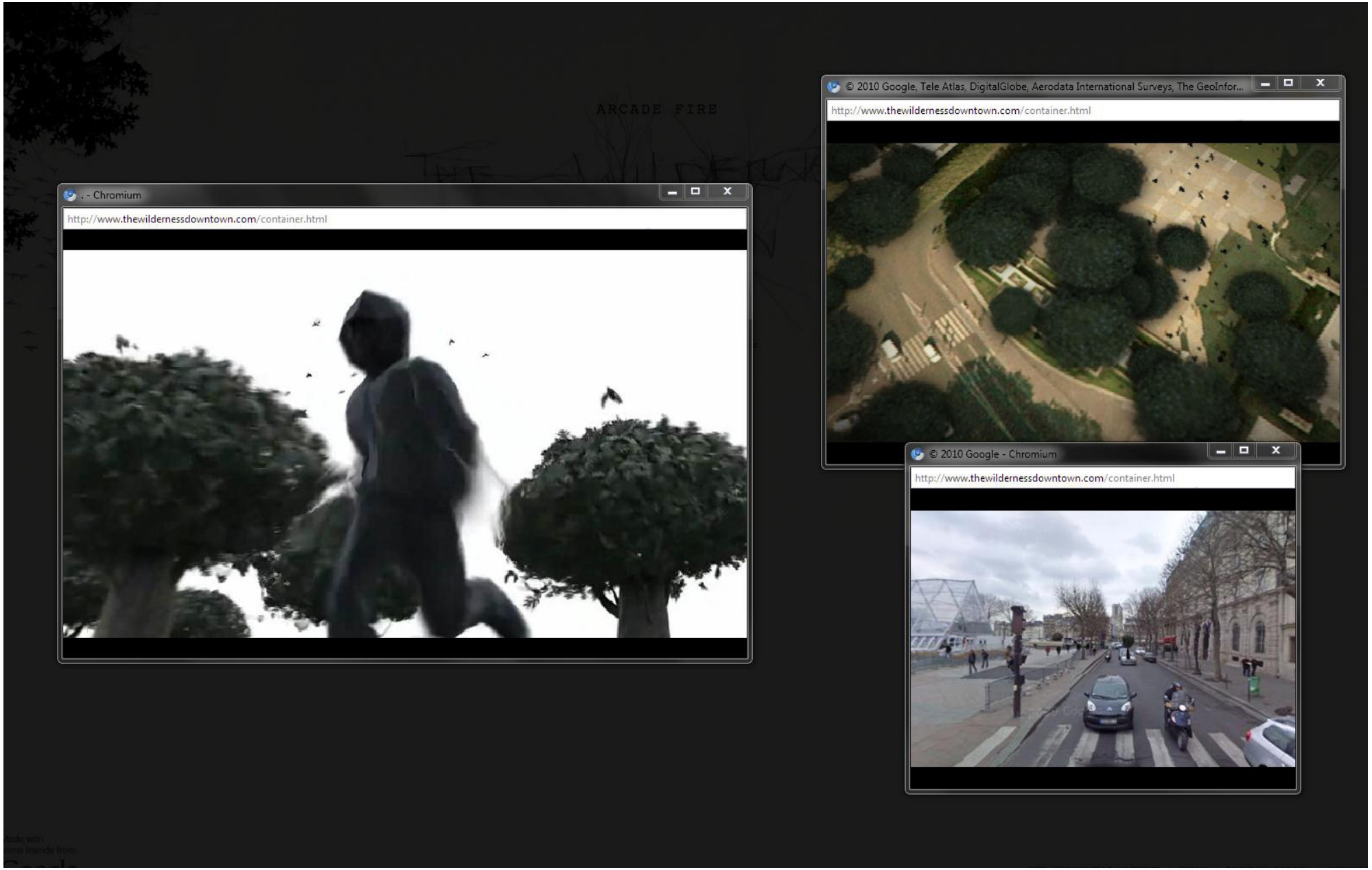
Frieder Nake
“Random Polygons”
1965


NAKE/ER56/Z64

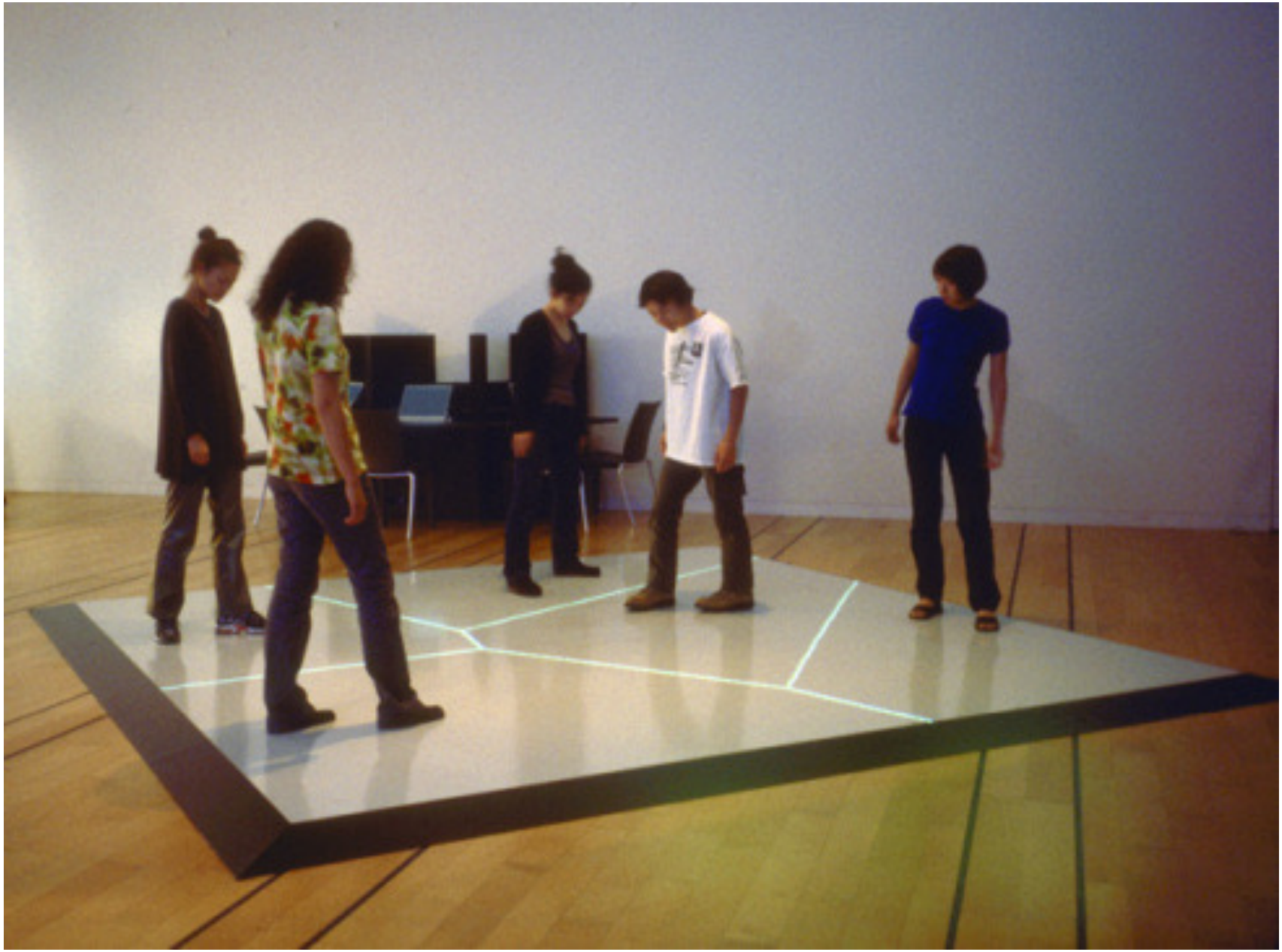
Nake: human algorist
ER56: electronic computer
Z64: plotter


NAKE/ERSE/264



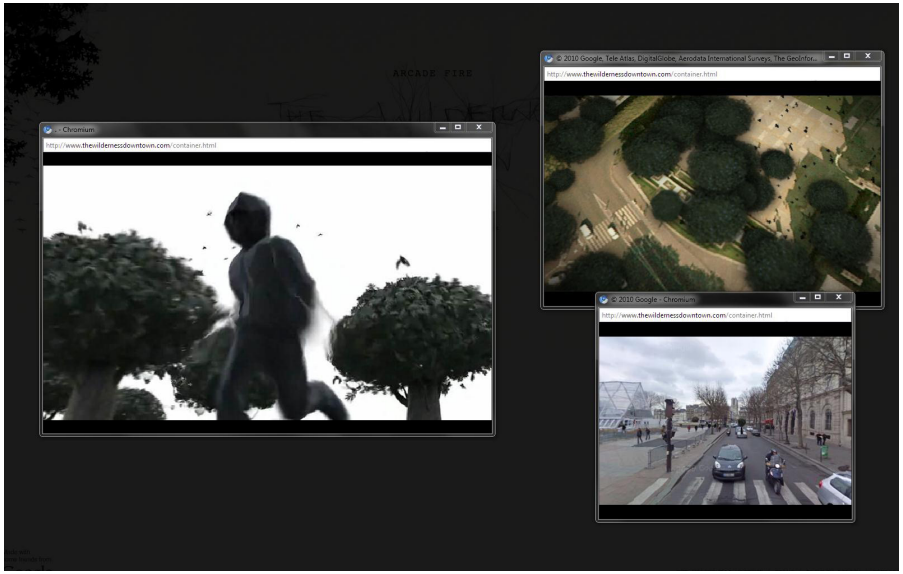


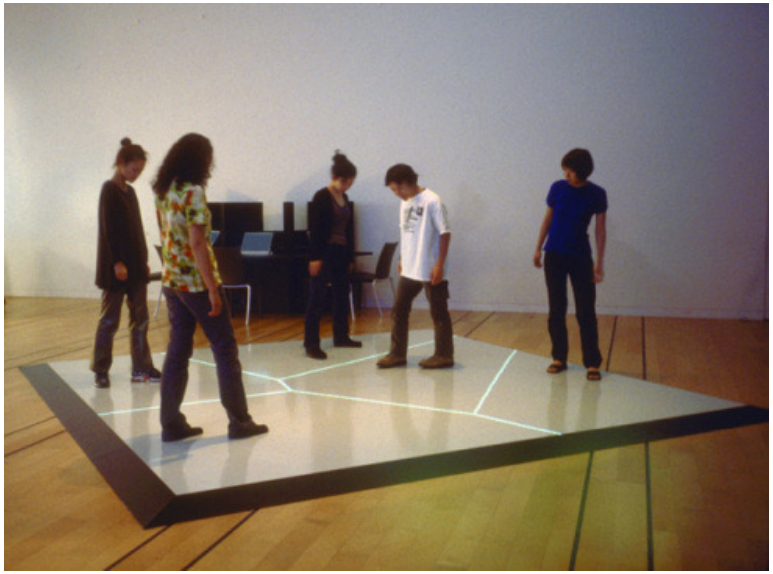
Chris Milk, "The Wilderness Downtown", 2010



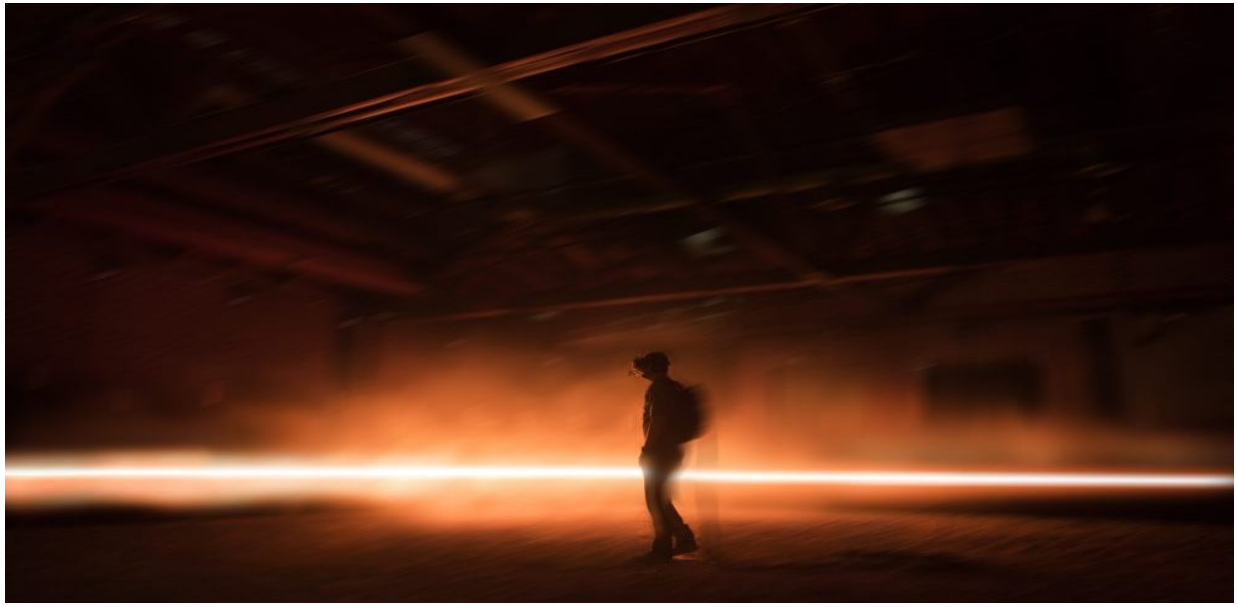
Scott Snibbe, “Boundary Functions”, 1998

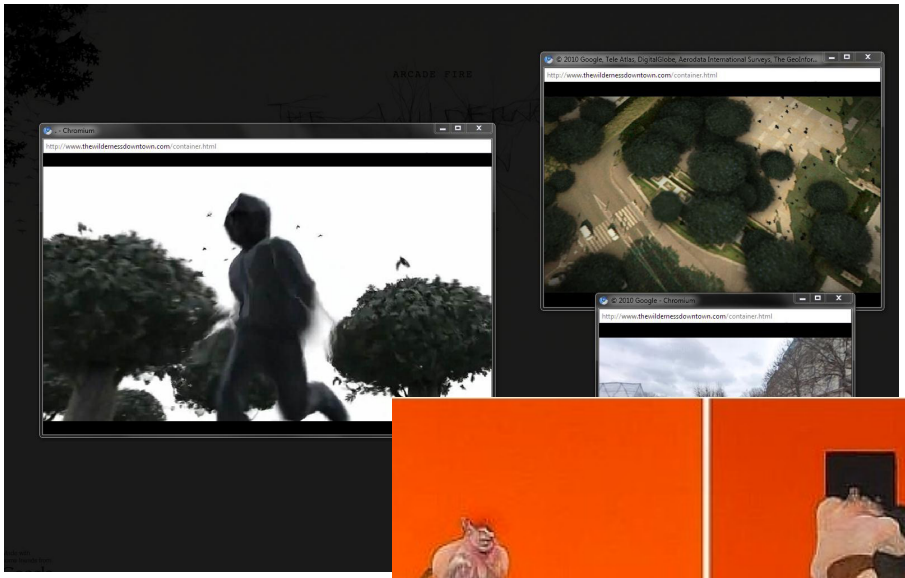
Alejandro González Iñárritu, “Carne y Arena”, 2017

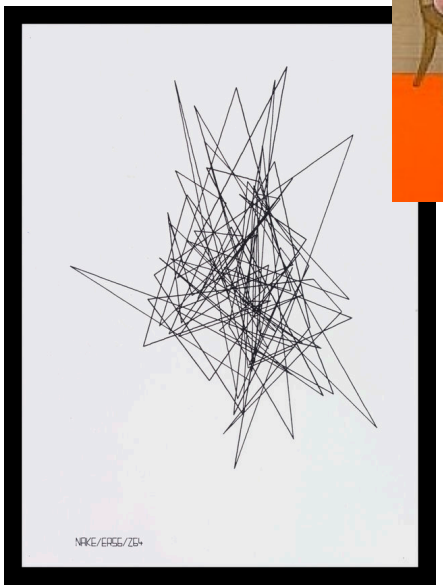

ARCADE FIRE
Chromium
http://www.thewildernessdowntown.com/container.html
© 2010 Google Tele Atlas, DigitalGlobe, Aerodata International Surveys, The GeoInfor...
http://www.thewildernessdowntown.com/container.html
© 2010 Google - Chromium
http://www.thewildernessdowntown.com/container.html

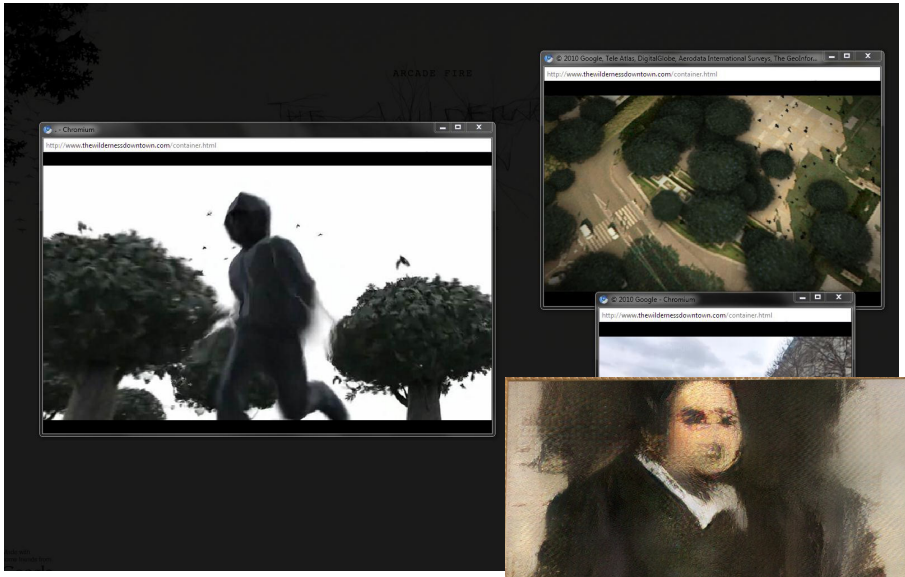


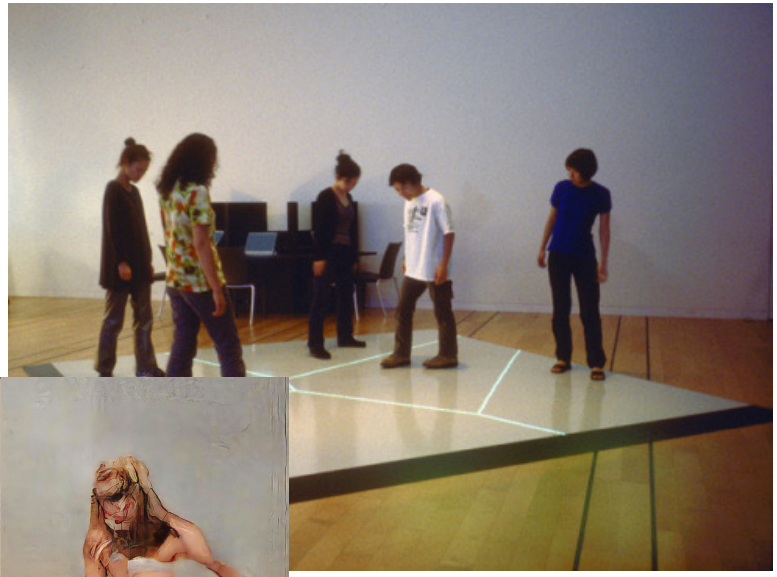

NIKE/ERGE/ZEN

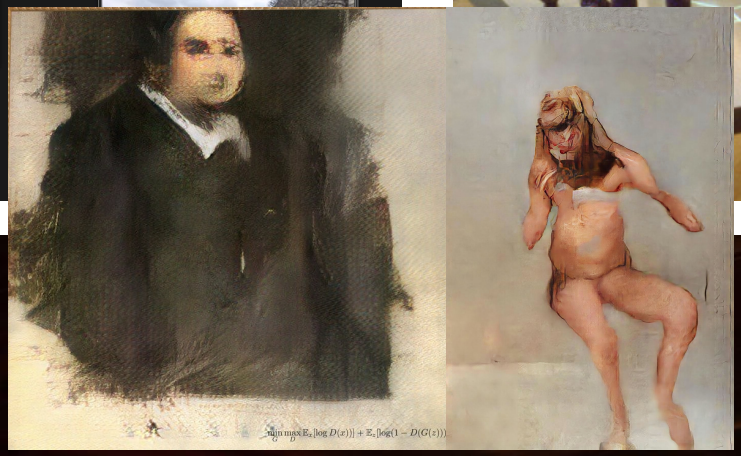



ARCADE FIRE
Chromium
http://www.thewildernessdowntown.com/container.html
© 2010 Google Tele Atlas, DigitalGlobe, Aerodata International Surveys, The GeoInfor...
http://www.thewildernessdowntown.com/container.html
© 2010 Google - Chromium
http://www.thewildernessdowntown.com/container.html

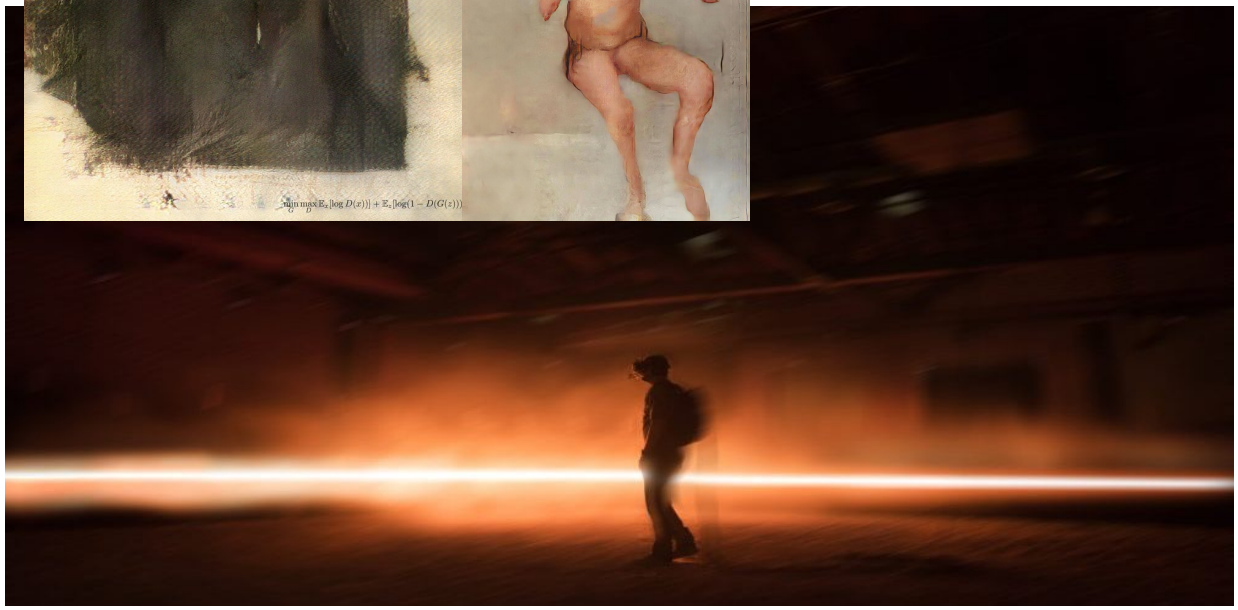

NIKE/ERGE/ZEN


ARCADE FIRE
Chromium
http://www.thewildernessdowntown.com/container.html
© 2010 Google Tele Atlas, DigitalGlobe, Aerodata International Surveys, The GeoInfor...
http://www.thewildernessdowntown.com/container.html
© 2010 Google - Chromium
http://www.thewildernessdowntown.com/container.html




$\min_G \max_D \mathbb{E}_x[\log D(x)] + \mathbb{E}_z[\log(1 - D(G(z)))]$


NIKE/ERGE/ZEN



“The digital in digital art”
M. Verdicchio
Studi di Estetica No. 12 (2018)

https://journals.mimesisedizioni.it/index.php/studi-di-estetica/article/view/626/1077