

A.I. Art

Definitions

What is art?

What is Intelligence?

What is Artificial?

A.I. ART: COMPLICATED

- Let's narrow it down: a few applications of Machine Learning to Creativity



Machine Learning

- “Science (and art) of programming computers so they can learn from data”

Aurélien Géron

Classification criteria:

1. Whether trained with **human supervision** (supervised, unsupervised, semisupervised, reinforcement)
2. Whether can learn incrementally on the fly (online versus batch learning)
3. Whether just compare data points or detect patterns and **build predictive models** (instance-based vs. model-based)

Current Uses and Thought Experiments

- Objective: AI generalizing intelligence across different domains
- Now, narrow artificial intelligence is still pretty cool
- Journey through how AI is impacting art and some known commercial applications

Generate Paintings with AI

- Over impose painters' styles on images, usually photographs,
- Generation of photograph-like sceneries from paintings' landscapes
- Social Media Filters, Zebrification, turning shoe drawing into picture
- Big weights in deeper layers emphasizes lower-level (more abstract) features!

Deep Fakes (nice try)

Content target



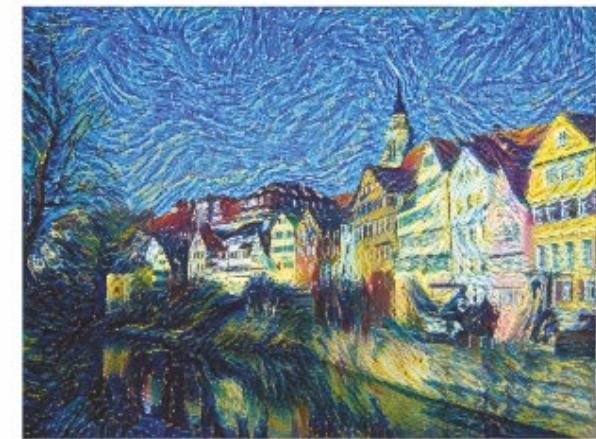
+

Style reference



=

Combination image



CycleGAN

Original Monet



Generated photograph



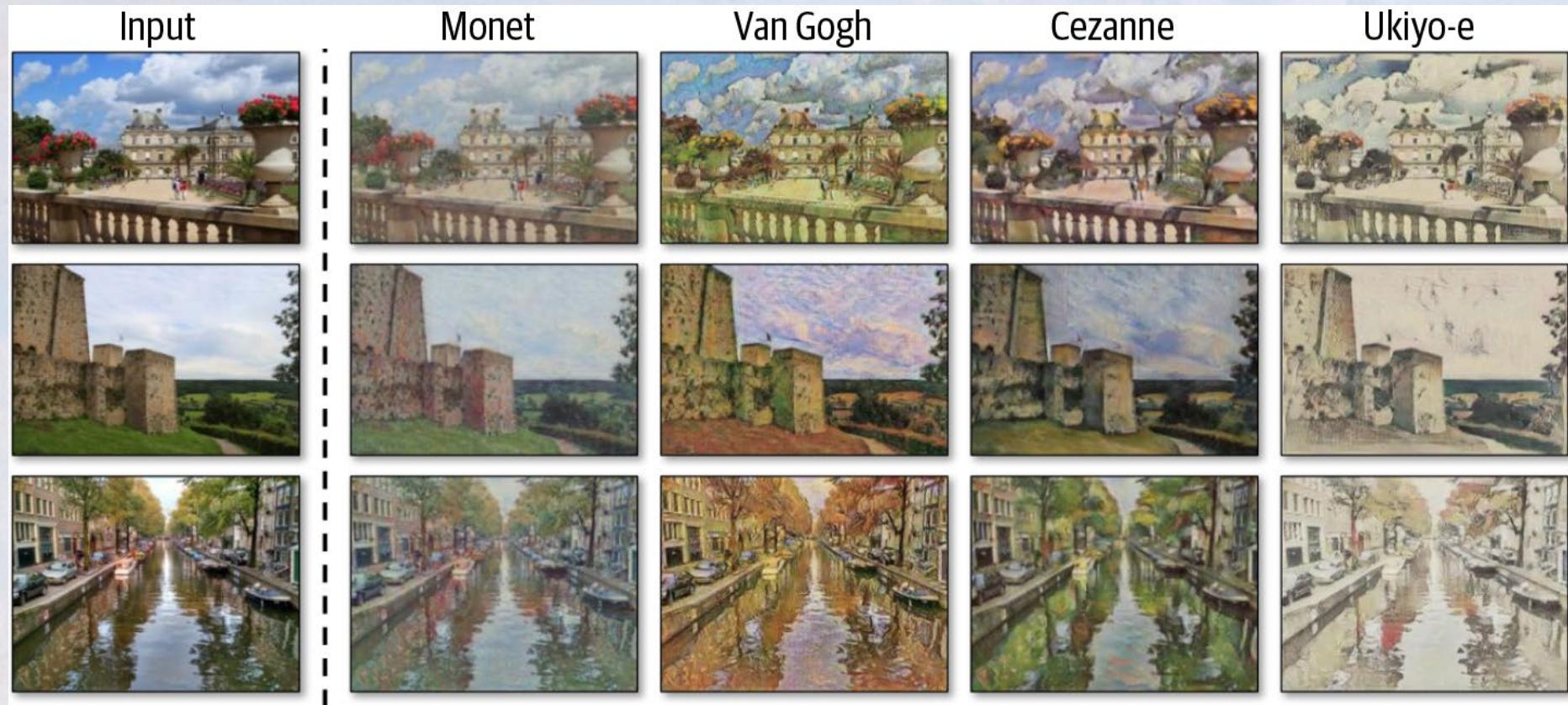
Original photograph



Generated Monet



Neural Style Transfer



MuseGAN: Music Generation

A piano sheet music example generated by MuseGAN, showing two staves of music in G major (two sharps) at a tempo of 66 BPM. The top staff uses a treble clef and the bottom staff uses a bass clef. The music consists of eighth and sixteenth note patterns.

Piano

Piano

$\text{♩} = 66$

Commercial Applications to Music

- Sony (but all majors) apply AI to artists' music.
- Clash of philosophies: “Do we want to make real music or make more money?”
Today, choice is still somewhat left to artist
- Multi million-dollar start-ups are looking for the perfect melody for each audience.
- Will see an increment of applications of ML to music to increase sales and audience development. Lower margins and increased competitiveness since Napster.

NLP: WRITING

- NLP (natural language processing) applications
- OpenAI's GPT-2 is cutting-edge. No special architecture, but has 1.5B parameters
Trained for 2 days on a powerful supercomputer. Input: everything with 2+ upvotes
on reddit including external pages linked from reddit.
- Grammarly, SMMRY, semantic analysis of sentences, Sentiment Analysis (stock
trading and behavioral investing), Marketing

Input: John Donne

“Yet if, so be it,

we lose our bloods,

Still, we have no blame for killing one of us.

The two, though in this life,

We must live in, and the one live in another,

A third cannot be made, but it must be made,

Yet for two, it is not enough.

And that one, if you have no doubt, Is not our son's.

And that this flea, with his blood's share,

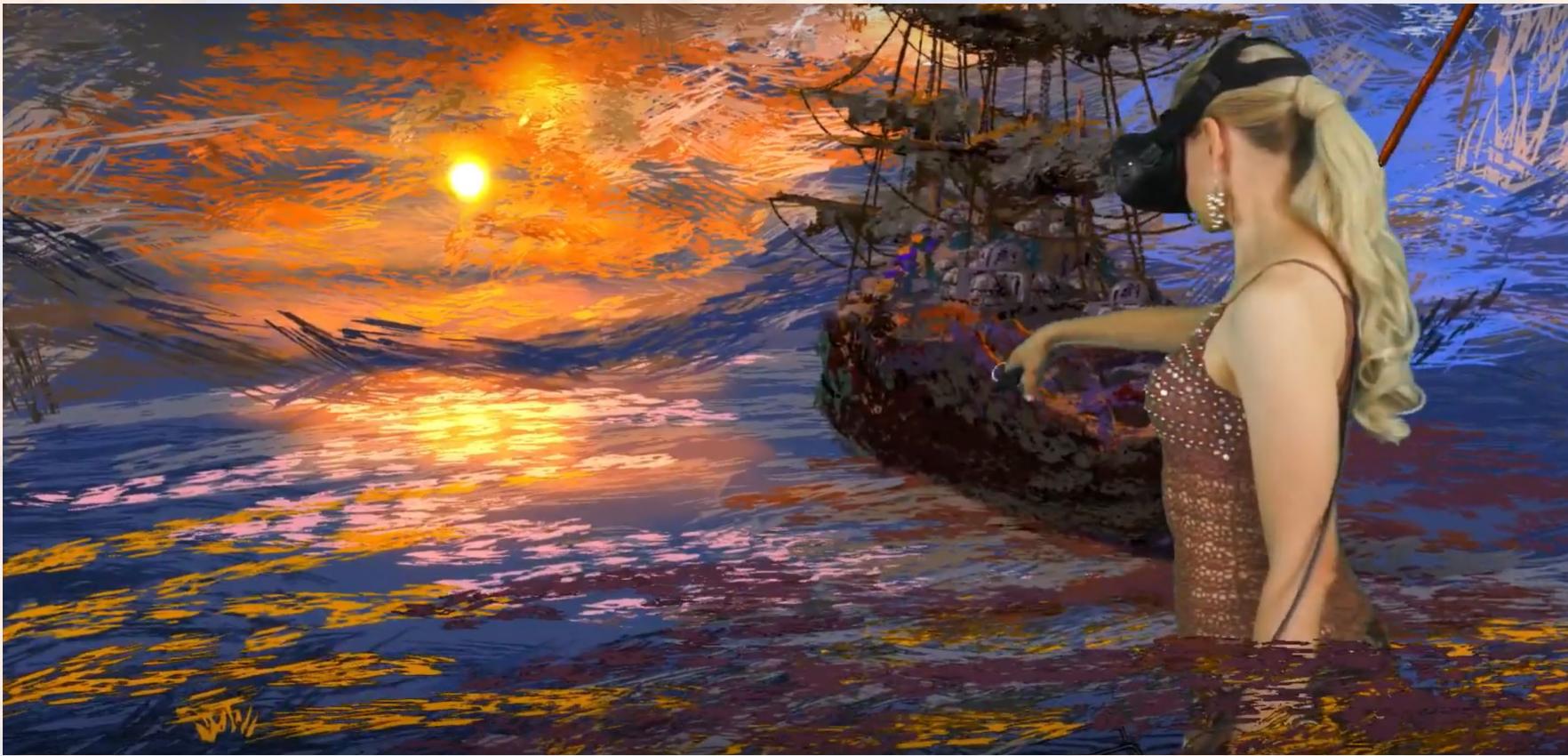
Will have our flesh to chew the same”

GPT-2, text generation

A.I. creating new arts?

- VR, MR, AR are just some examples
- Is AI creating new arts or is it just the unfolding of the arts taking advantage of a new medium of expression?
 - Cannot deny these new kinds of expression entail creativity

ART in VR



Conclusion

- AI and technology in general will extend the medium of expression. Kill creativity?
Might entail an evolution of forms of creativity
- Technology Advancements will transform art and empower artists

References

1. Generative Deep Learning, David Foster
2. Hands-on Machine Learning with Scikit-Learn, Keras & TensorFlow, Aurélien Géron
3. Deep Learning with Python, Francois Chollet
4. Definition of Art, Stanford Encyclopedia of philosophy
5. "Hopes" Virtual reality painting, www.youtube.com