

Talk by Lisa Becker @LisaGreenspecs  
at womendotcodebe TechTalks, February 25th 2021

# Generative Adversarial Networks

The technology behind Deepfakes

# Who knows this person?



# Who knows this person?



<https://thispersondoesnotexist.com/>

# What are GANs?

GAN: Generative Adversarial Networks

- Introduced by Ian Goodfellow in 2014
- consist of two neural networks competing “against each other”:

GENERATOR



**generates** an image  
(or video, audio, ...)  
→ “the artist”

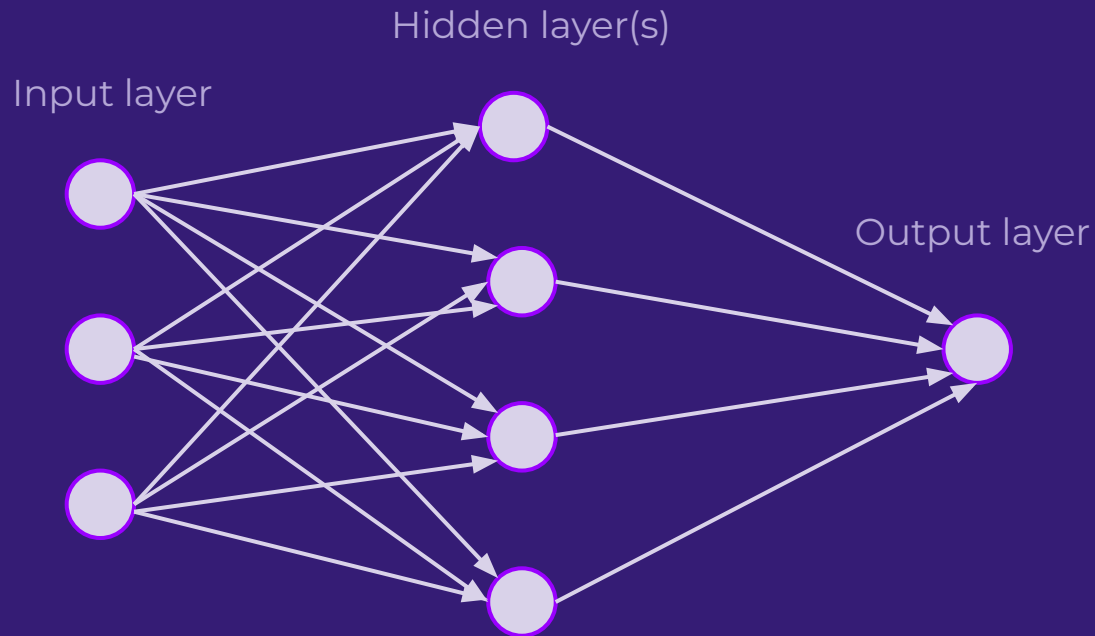


DISCRIMINATOR

**discriminates** an image  
(or video, audio, ...)  
→ the “art critic”

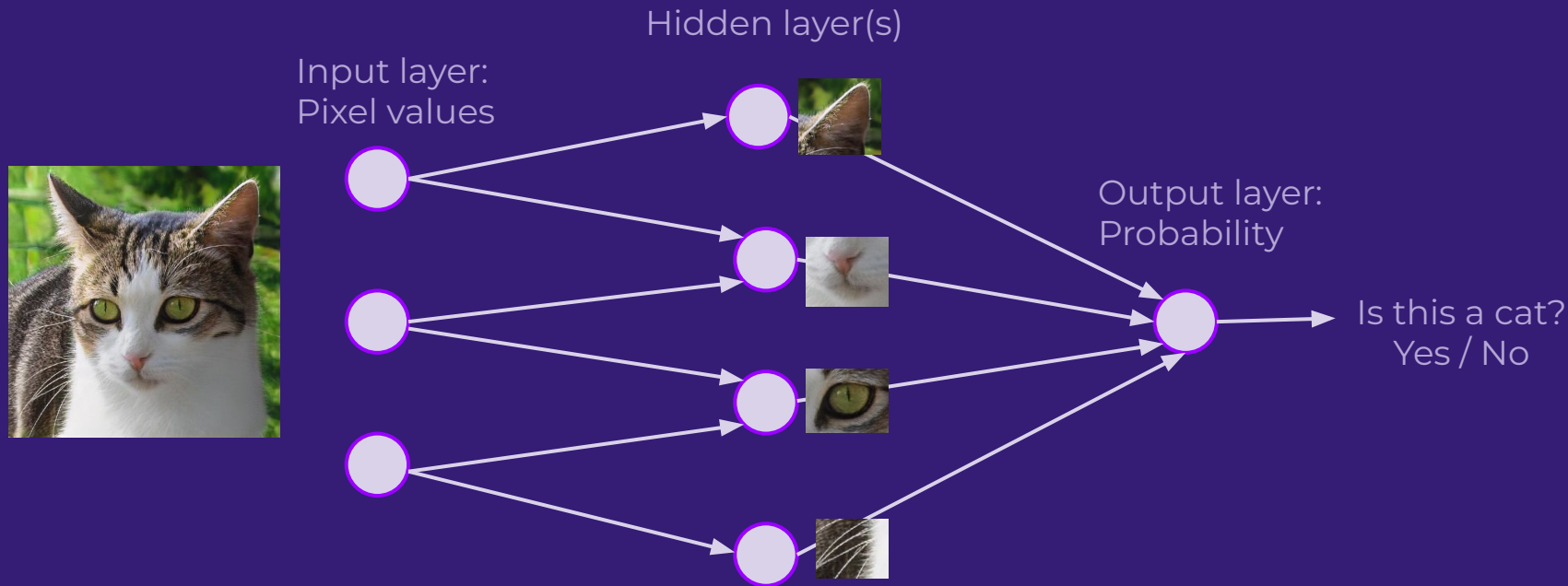
# What are GANs?

→ what is a neural network?



# What are GANs?

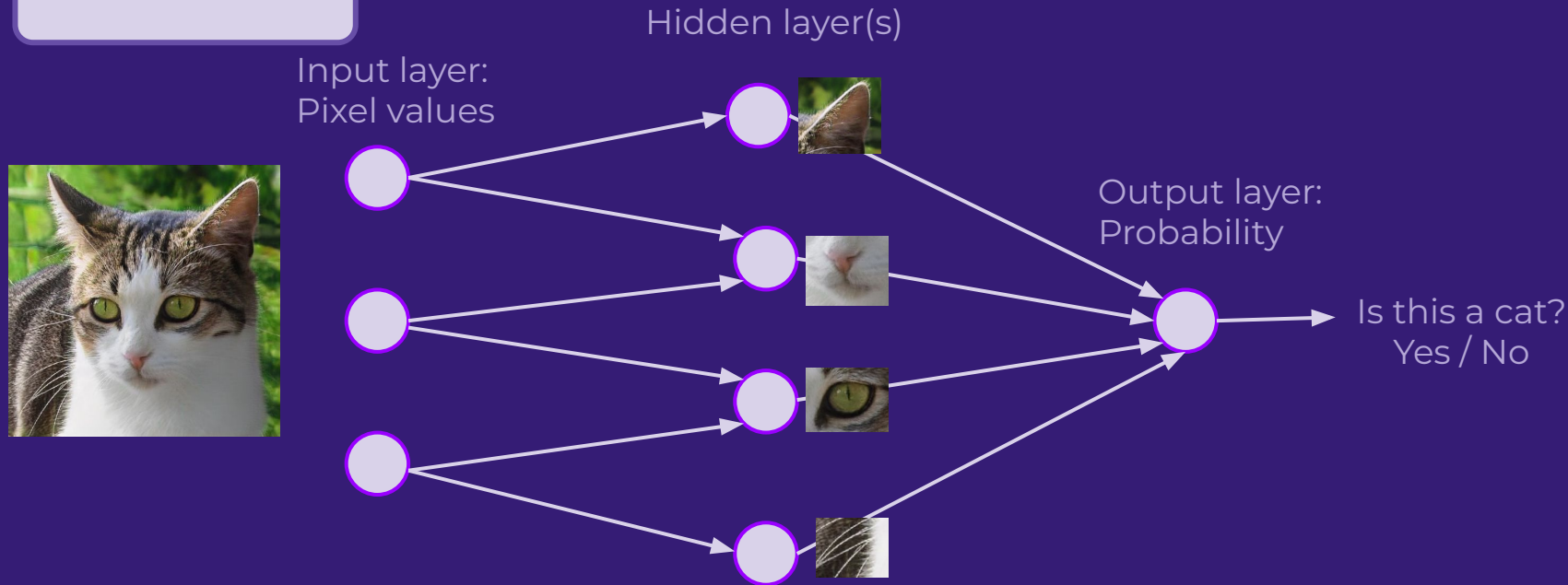
→ what is a neural network?



# What are GANs?

→ what is a neural network?

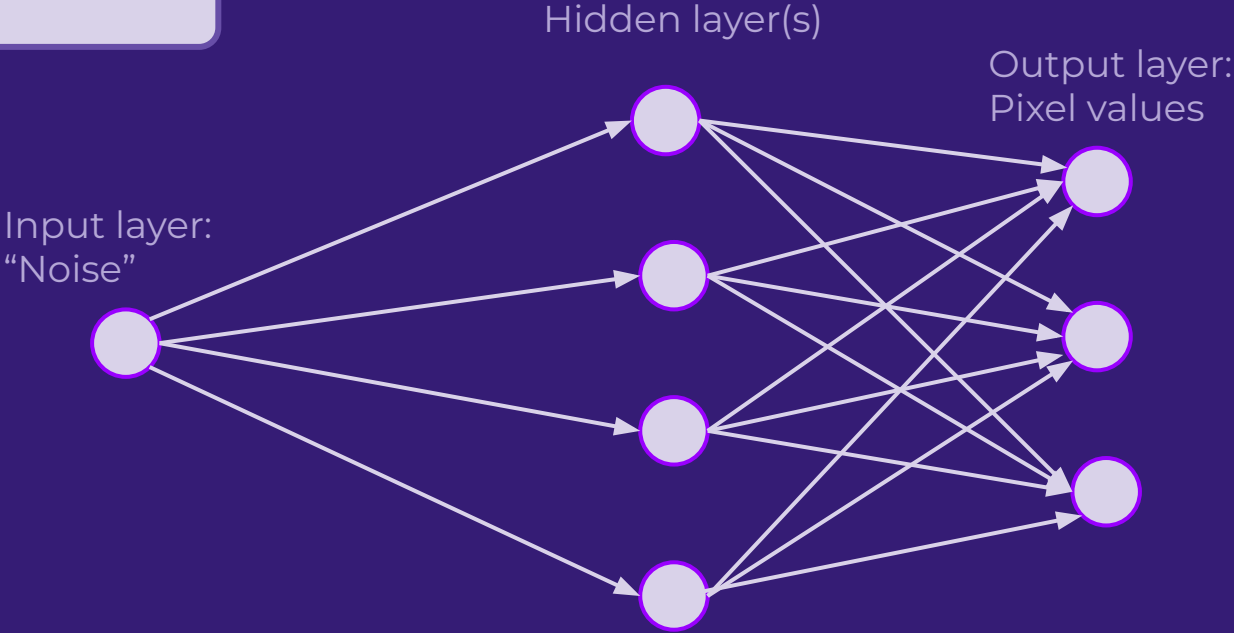
## DISCRIMINATOR



# What are GANs?

→ what is a neural network?

**GENERATOR**





# What are GANs?



GENERATOR

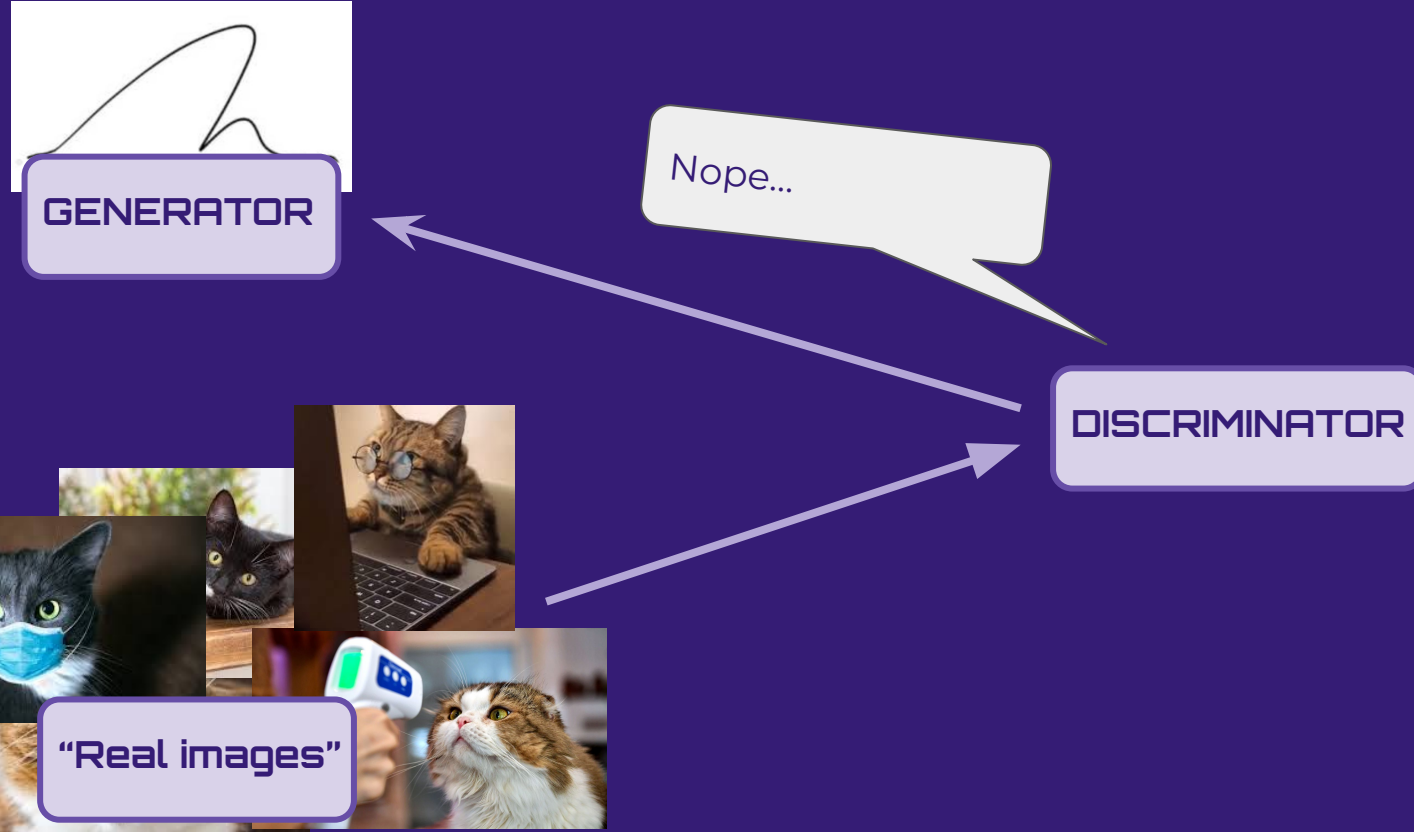
"Is this a cat ???"

DISCRIMINATOR

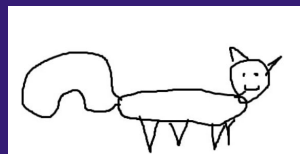


"Real images"

# What are GANs?



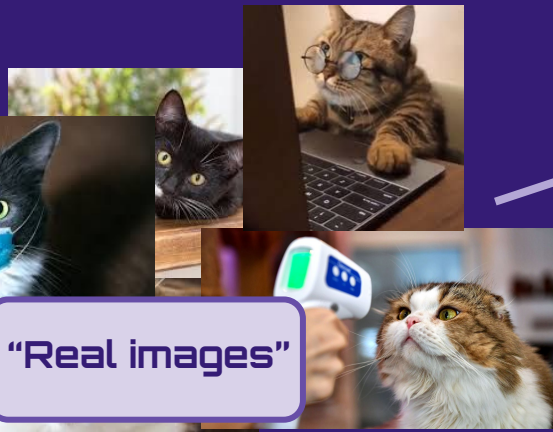
# What are GANs?



GENERATOR

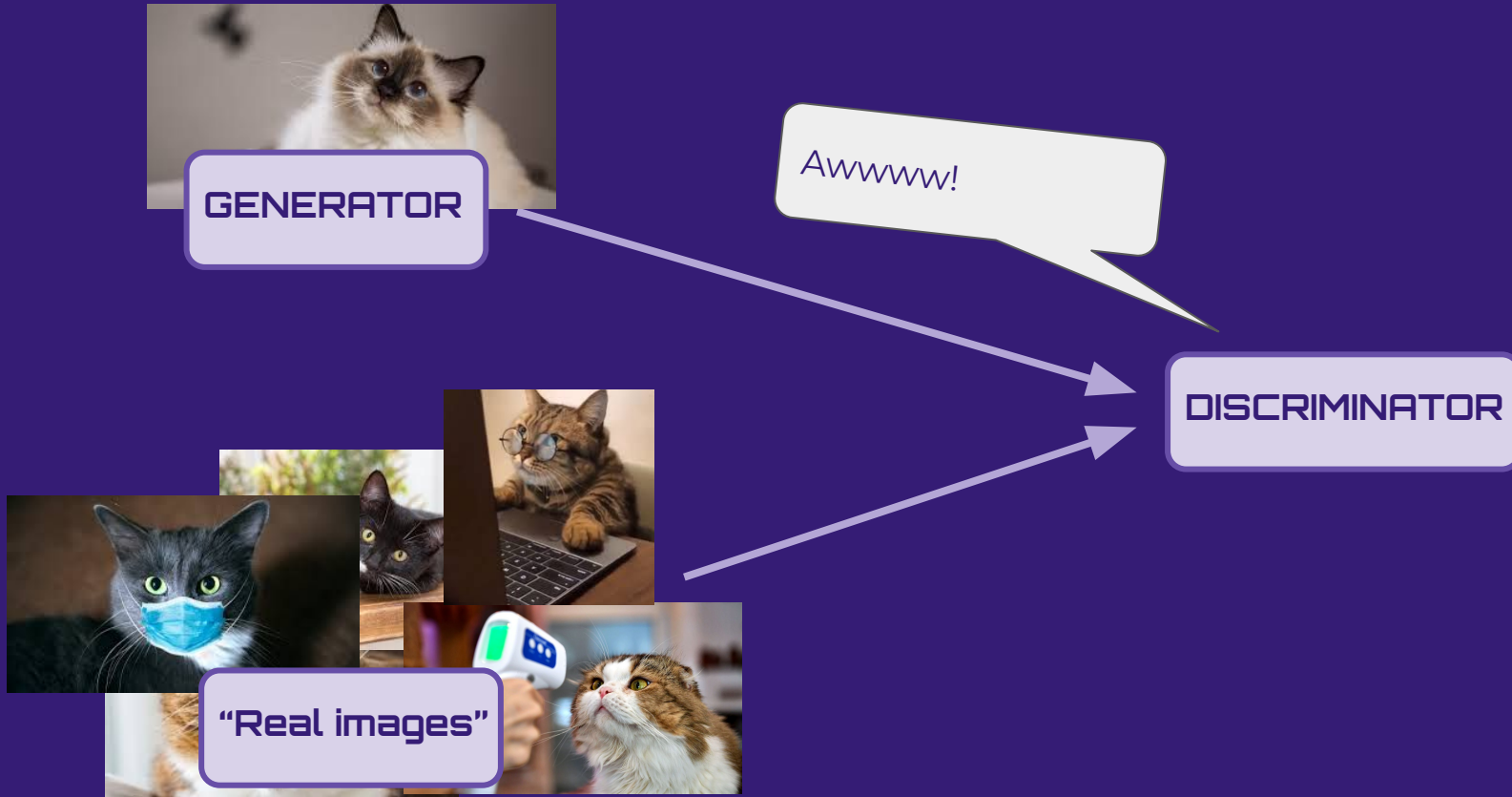
That's better!

DISCRIMINATOR



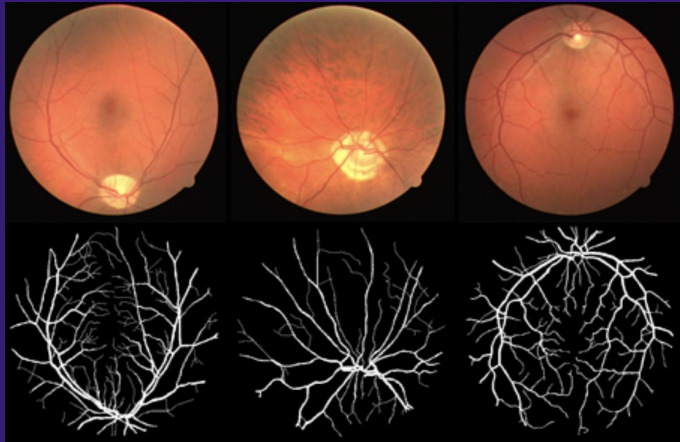
"Real images"

# What are GANs?



# What are GANs used for?

- science
- arts / video games / filters



Torrado et al. 2019

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- science
- arts / video games / filters



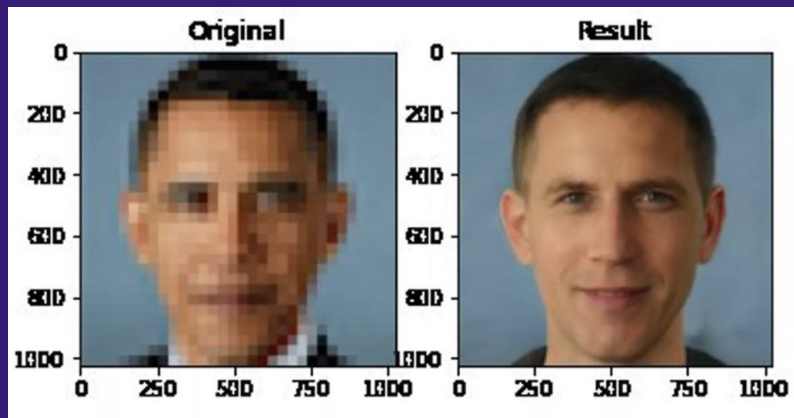
Reddituser: Derpfake,  
Movie: Man of Steel

# What are GANs used for?

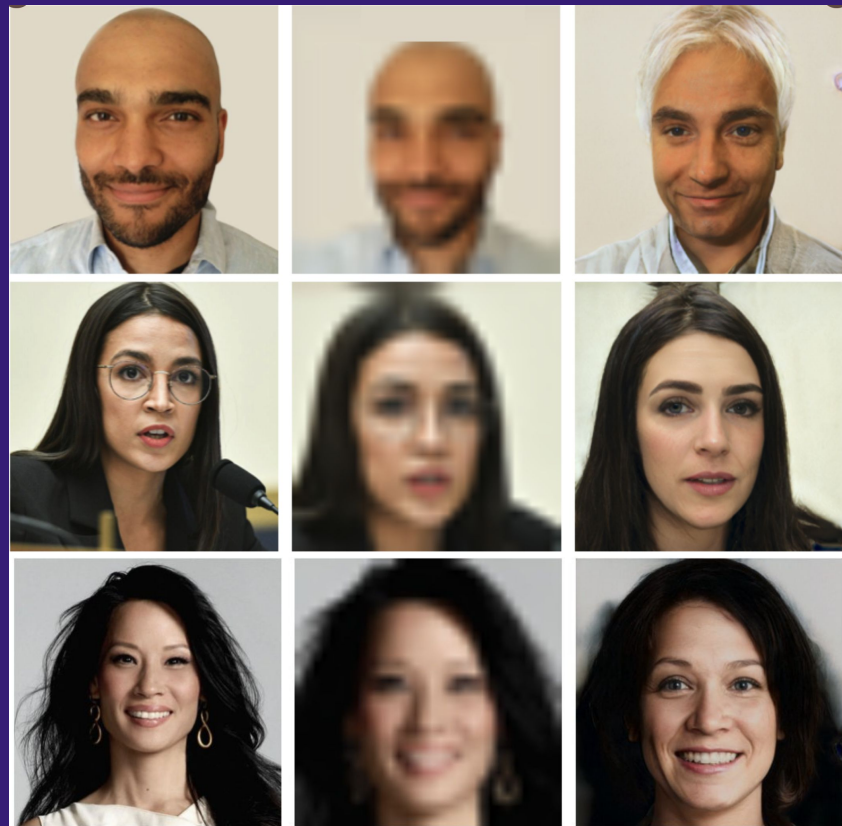
- science
- arts / video games / filters
- grief therapy: therapist “impersonates” deceased person

# Downsides of GANs

- (racial) bias



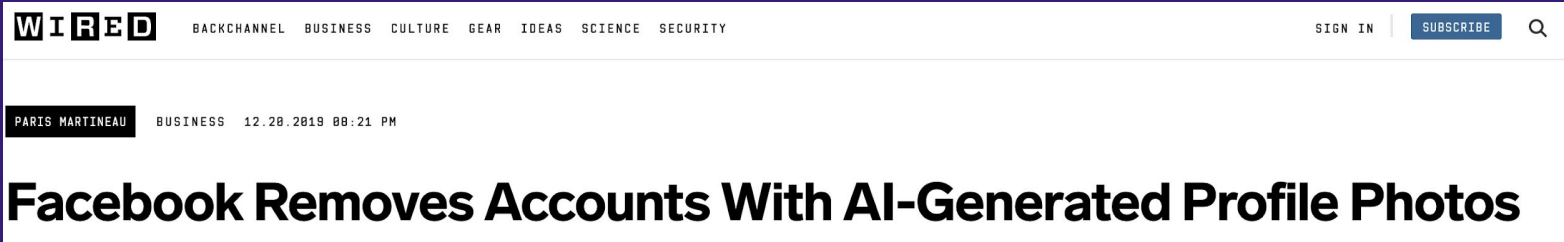
Twitteruser  
@osazuwa 06/2020





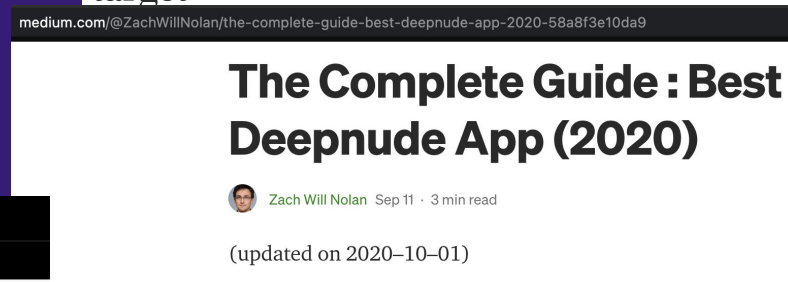
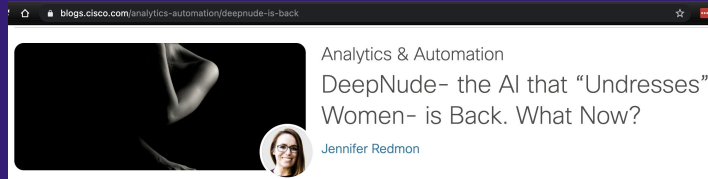
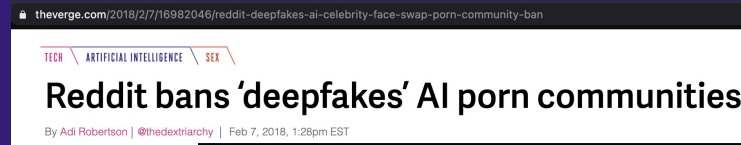
# Downsides of GANs

- (racial) bias
- fake identities: social media bots



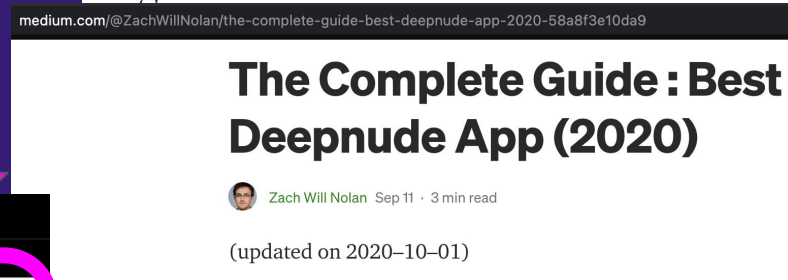
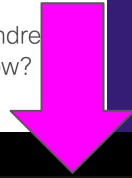
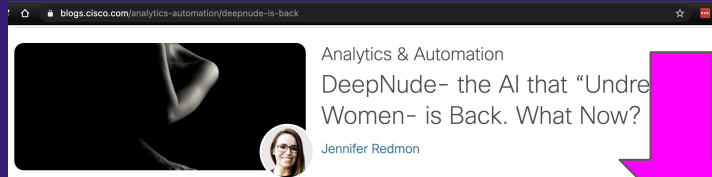
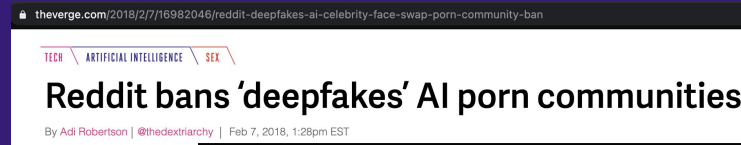
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- identity theft



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[Huffingtonpost 11/2018](#)



# Downsides of GANs

- (racial) bias
- fake identities
- identity theft
- tampering with medical imagery
- ... and many more things we can't even think of yet

# Conclusion

- GANs consist of two neural nets “competing” against each other
- produce hyperrealistic images (videos, audio, ...)
- it gets easier and easier to use GANs
- despite their positive impact,...
- they can be very harmful

# Thank you for your attention!

