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Deepfakes in Art, Culture, Education, and for Immersive Experiences

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What are deepfakes?

Deepfakes are manipulated or synthetic audio-visual media of human faces, bodies, or voices, which look or sound (relatively) authentic and are often created using artificial intelligence (AI).

1. **Synthetic images**
2. **Synthetic audio files**
3. **Synthetic videos**
 - a. **Faceswap:** face in a video is replaced with face of another person.
 - b. **Lipsync:** mouth area is matched to an arbitrary audio recording.
 - c. **Facial reenactment/puppeteering:** target person's facial expressions, head or body movements are "animated" by a performer in front of a camera.



Technological state of the art

 **Ian Goodfellow** @goodfellow_ian · 15. Jan. 2019

4.5 years of GAN progress on face generation. arxiv.org/abs/1406.2661
arxiv.org/abs/1511.06434 arxiv.org/abs/1606.07536 arxiv.org/abs/1710.10196 arxiv.org/abs/1812.04948



42 1.577 3.801



[Thispersondoesnotexist.com](https://thispersondoesnotexist.com)

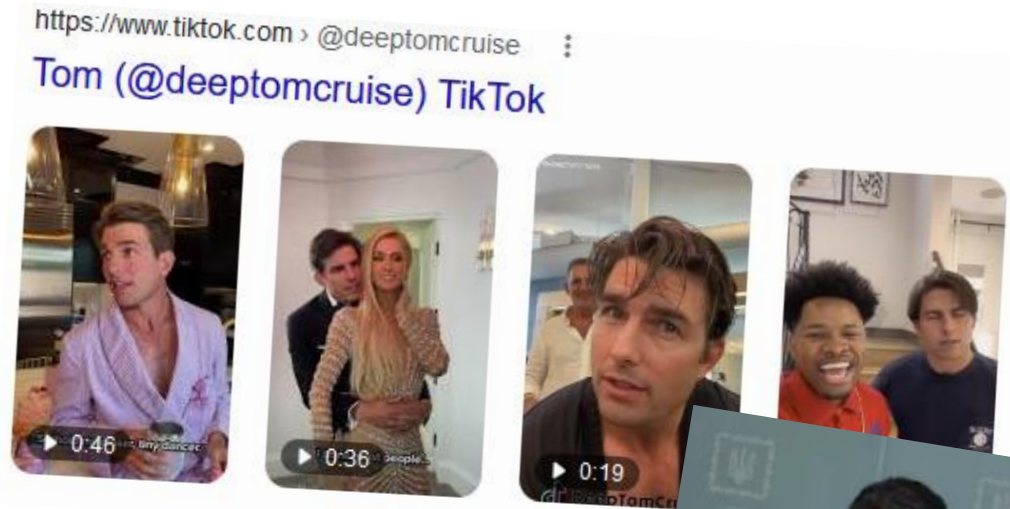
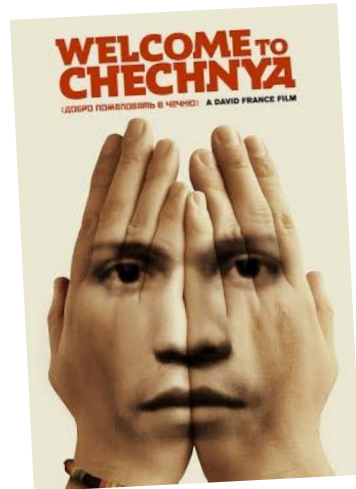
https://twitter.com/goodfellow_ian/status/1084973596236144640?ref_src=twsrc%5Etfw%7Ctwcamp%5Etweetembed%7Ctwtterm%5E1084973596236144640%7Ctwgr%5E&ref_url=https%3A%2F%2Fmixed.de%2Fgeschichte-der-deepfakes-so-rasant-geht-es-mit-ki-fakes-voran%2F



What are deepfakes used for?



<https://sputniknews.com/science/201906271076070161-new-ai-powered-app-nude-photos-women/>



[https://www.tiktok.com @deeptomcruise](https://www.tiktok.com/@deeptomcruise)
Tom (@deeptomcruise) TikTok



© Sassy Justice



<https://www.oneclub.org/awards/theoneshow/-award/37009/dal-lives>



© Focus.de/Instagram

Deepfakes in the film, music, and advertising industry

- Rejuvenation and ageing
- Dubbing (lip sync, synthetic audio)
- Post-editing (misspoken/age-inappropriate words)
- Localization, hyper-personalized marketing
- Performing in absence
- “Digital resurrection”



<https://brf.be/kultur/medien/1642904/>



Deepfakes in the gaming industry (and XR)

- More realistic avatars
- Superimposing body movements onto avatar
- Synthetic voice generation
→ replacing gamer's voice with that of character



<https://www.youtube.com/watch?v=RR7u11ANDWE>



Deepfakes in art



If Mark Zuckerberg had a reckoning...

“Deep Reckonings” (Stephanie Lepp, 2020)



Deepfakes for education (and in XR)



<https://localprojects.com/work/museums-attractions/the-march/>

Deepfakes of the deceased (and the digital afterlife industry)

- Animating pictures of the deceased
- Voice clones (partially interactive)
- “Participation” in one’s own funeral

Ethical and societal challenges

- Changing culture of remembrance, mourning, cultural practices surrounding death
- Importance of consent
- Deceased’s personal rights and dignity
- Psychological impact on family and friends



Virtual humans and the metaverse



<https://voicebot.ai/2022/10/11/soul-machines-and-ibm-watson-powered-virtual-human-concierge-expanding-at-dallas-airport/>

„Digital Iris“, synthetic concierge at
Dallas International Airport 2022



<https://www.btcc.com/en-US/academy/research-analysis/everything-you-need-to-know-about-avatar-in-metaverse>