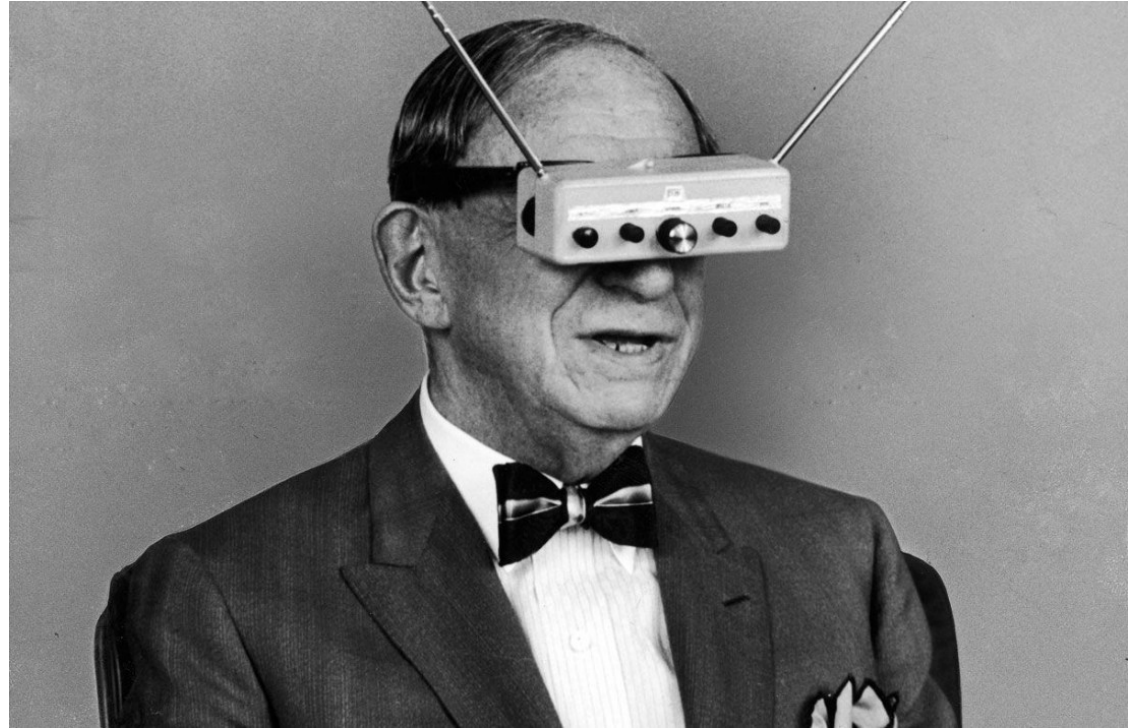


# DEEPPFAKES + MIXED REALITY #FAKEREALITY?

Jeanine Reutemann  
Research Fellow; Digital Media Designer; Lecturer



**«Photography is truth. The cinema is  
truth twenty-four times per second»**

**JEAN-LUC GODARD, 1960.**

**«Photography is truth. The cinema is truth twenty-four times per second»**

JEAN-LUC GODARD, 1960.

**So what about 360-Virtual Reality,  
at 120 frames per second?**

paradim ***SHIFT?***





1968; Ivan Sutherland and Bob Sproull





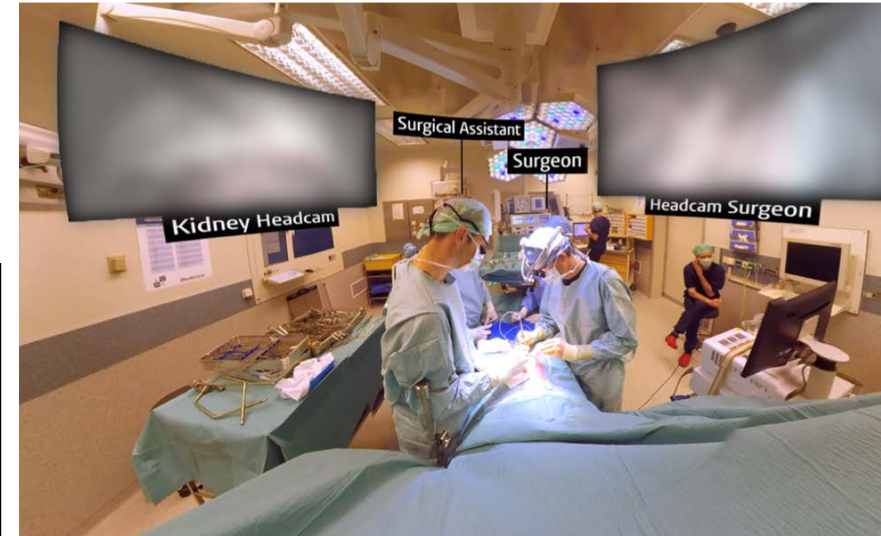
Clouds Over Sidra



# VR 360-Video







CENTRE FOR  
INNOVATION  
Tilburg University



Universiteit  
Leiden







## **360-Virtual Reality**

Immersive experiences

Sense of presence

Embodiment

## **360-Virtual Reality**

Immersive experiences

Sense of presence

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# **VIRTUAL EMPATHY**

DEATH MENTAL HEALTH VIOLENCE  
IMPERIALISM MISUNDERSTANDING  
COMBOGENESIS NEUROSCIENCE  
NARRATIVE INTERMEDIARY FORMS  
DIALOG  
ETHICS  
LOVE  
COMPASSION  
EPISTEMOLOGICAL TURN  
GENDER NONHUMAN  
SUFFERING  
MONSTROUS NURSE  
TRANSNATIONAL  
ANIMALS  
POWER  
ENTANGLEMENT  
VIDEO WORK  
DIGITIZATION  
EMOTIONAL EXCHANGE  
DEAD DOGS  
IMAGINARY  
CONTROL  
DARK SIDE  
NATURE  
FEMINISM  
ELEMENTAL  
CONTROL

*EXPLORING THE DIVERSITY OF*

**EMPATHY**

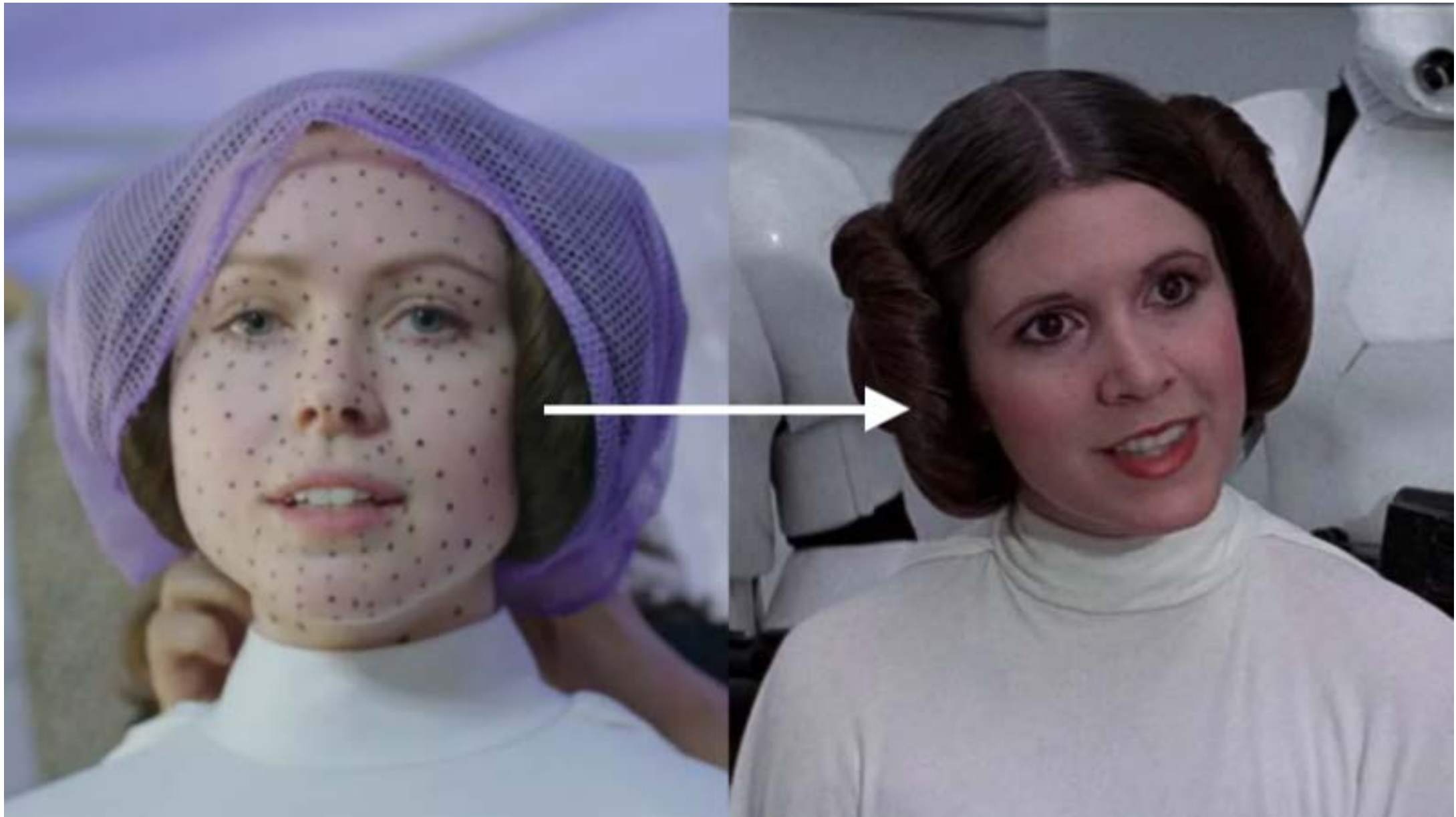


**(FLAT) VIDEOS**

# VIDEO RECEPTION IN CAMBODIA

Information on Facebook and other social media is believed when:	Level of Trust						
	0%	1%-20%	21%-40%	41%-60%	61%-80%	81%-100%	Don't know
It is posted by an individual I trust	0.1%	5.3%	12.8%	45.6%	20.2%	15.7%	0.2%
It is shared by an individual I trust	1.9%	9.3%	23.0%	44.8%	12.4%	7.9%	0.7%
It is posted by organization I trust	0.3%	3.0%	10.5%	32.8%	28.1%	24.9%	0.5%
It is shared by organization I trust	1.8%	8.4%	18.2%	43.8%	18.2%	9.0%	0.6%
It includes pictures	0.6%	8.1%	16.9%	37.1%	21.3%	15.9%	0.1%
It includes videos	0.5%	4.1%	11.6%	29.9%	24.1%	29.7%	0.1%
There are many likes/shares	1.6%	4.7%	12.4%	32.0%	26.1%	22.5%	0.8%
It is from a Cambodian source	0.6%	4.4%	11.1%	34.1%	27.8%	21.8%	0.3%
It is from an international source	2.4%	9.9%	19.8%	33.1%	19.2%	13.0%	2.6%
It seems true or possibly true	2.6%	7.3%	15.1%	28.2%	24.2%	21.8%	0.8%

<https://asiafoundation.org/publication/mobile-phones-internet-use-cambodia-2016/>



# Face2Face: Real-time Face Capture and Reenactment of RGB Videos

*Justus Thies<sup>1</sup>, Michael Zollhöfer<sup>2</sup>,  
Marc Stamminger<sup>1</sup>, Christian Theobalt<sup>2</sup>,  
Matthias Nießner<sup>3</sup>*

<sup>1</sup>University of Erlangen-Nuremberg

<sup>2</sup>Max-Planck-Institute for Informatics

<sup>3</sup>Stanford University

**CVPR 2016 (Oral)**



# TWO MINUTE PAPERS

WITH KÁROLY ZSOLNAI-FEHÉR (KZF)

## AUDIO TO OBAMA: LEARNING LIP SYNC FROM AUDIO

Disclaimer: I was not part of this research project, I am merely providing commentary on this work.

**Deepfakes**

**Audio-to-Audio**

**Text-to-Speech**

**Facial Recognition;**

**Geo-Tracking;**

**Digital Nudging**

**[...]**



**In a few months from now,  
we won't be able to distinguish  
between deepfakes and 'normal'  
videos.**

**Are we?**

**ORIGINAL**

**DERPFAKES**



★THE PRESIDENT

★THE PRESIDENT



**YES & NO**





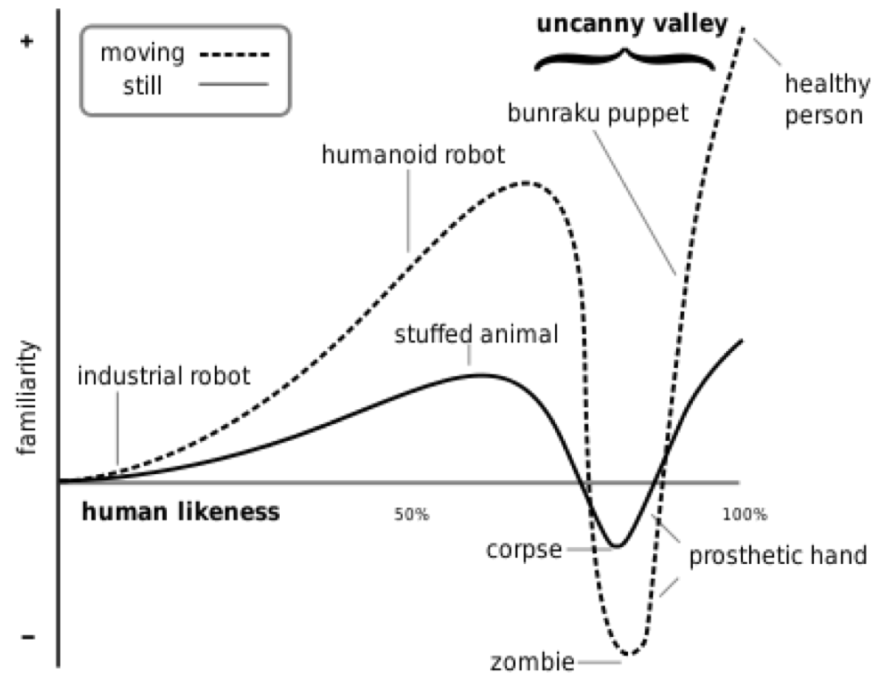






rgba rgba.alpha RGB  
f/s  
A Mergel B Mergel  
Y 1  
zdf\_neo  
overlay on, no animation

# Deepfakes: Uncanny Valley Effect



# Continuous Race

# VERIFICATION STRATEGIES?

**«Amnesty International is already grappling with some of these issues. Its Citizen Evidence Lab verifies videos and images of alleged human-rights abuses. It uses Google Earth to examine background landscapes and to test whether a video or image was captured when and where it claims. It uses Wolfram Alpha, a search engine, to cross-reference historical weather conditions against those claimed in the video.»**

**Fake news: you ain't seen nothing yet,**

**<https://www.economist.com/news/science-and-technology/21724370-generating-convincing-audio-and-video-fake-events-fake-news-you-aint-seen>**

# **VERIFICATION STRATEGIES?**

**Media: unique key that only the signing organisation—or the originating device—possesses.**

# **VERIFICATION STRATEGIES?**

**Decentralized timestamping on the blockchain**



**All of these idea  
solutions will have  
no impact on our  
fakenews issue.**

# **CHANCES?**

**... No need for (boring) teaching videos anymore**



# CHANCES?

**... No need for (boring) teaching videos anymore**  
**... Gender swap in blockbuster movies**



# CHANCES?

- ... No need for (boring) teaching videos anymore
- ... Gender swap in blockbuster movies
- ... Selfie-issue 2.0 > the centre of all the stories?







paradim *SHIFT?*  
**FAKEREALITY**  
**CRISIS?**



# **WHAT CAN YOU DO PERSONALLY?**

- 1. Check your sources**

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- 3. Moving images are another language**
- 4. Train your perception of people: decode facial expressions, gestures of speaker (watch & listen)**

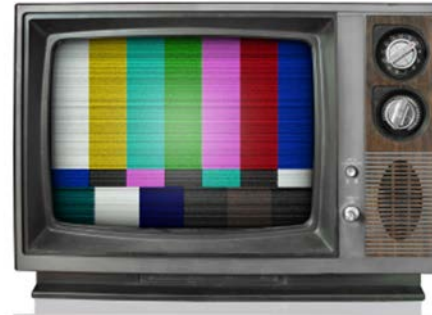


# **WHAT CAN YOU DO PERSONALLY?**

- 1. Check your sources**
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# **WHAT CAN YOU DO PERSONALLY?**

- 1. Check your sources**
- 2. Re-learn to watch videos precisely**
- 3. Moving images are another language**
- 4. Train your perception of people: decode facial expressions, gestures of speaker (watch & listen)**
- 5. Raise awareness in your own community**



?

Jeanine Reutemann  
Research Fellow; Digital Media Designer; Lecturer

slides on:  
[audiovisualresearch.org](http://audiovisualresearch.org)