

5G for Sceptics

Tim Kindberg, Matter II Media



Donald J. Trump ✓

@realDonaldTrump

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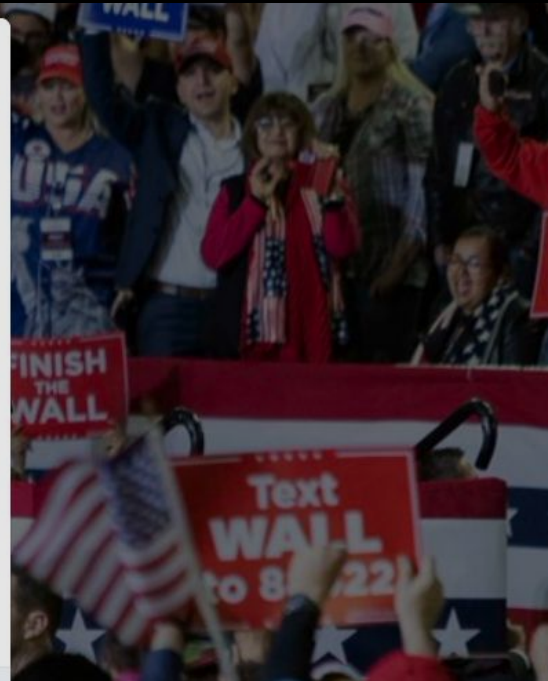
I want 5G, and even 6G, technology in the United States as soon as possible. It is far more powerful, faster, and smarter than the current standard. American companies must step up their efforts, or get left behind. There is no reason that we should be lagging behind on.....

1:55 PM - 21 Feb 2019

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31K 29K 144K



The 'Race to 5G' Is Just Mindless Marketing Bullshit

Buried beneath the hype around 5G rests a growing sense that wireless carriers are aggressively over-selling the technology's potential.

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Julian Chokkattu ✓
@JulianChokkattu

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I'm testing the Moto Z3 + 5G Moto Mod on Verizon's first 5G mobile network in Chicago! Almost hit 600Mbps just now, but I'm quite near the 5G node. I'll be walking around the city today, so ask me questions! #5G @DigitalTrends



4:50 PM - 5 Apr 2019

24 Comments

5g

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Name



Nick Kingston • a year ago

I for one have my chainsaw at the ready,the towers wont last long in my village,open your eyes people this is deadly.

11   • Reply • Share ›



wake up people • a year ago

DONT YOU GET WHAT THE AGGENDER IS BEHIND THE INTRODUCTION OF 5G,ITS NOT THE PHONE OR THE SPEED OF UPLOADING ITEMS OF THE INTERNET

15   • Reply • Share ›



wake up this guy → wake up people • a year ago

DON'T YOU SEE THAT IT'S SPELLED AGENDA NOT AGGENDER

6   • Reply • Share ›



Andy Collier → wake up this guy • a year ago

It's the message that is important not the spelling.

11   • Reply • Share ›

THE LIMITS OF 5G —

Millimeter-wave 5G will never scale beyond dense urban areas, T-Mobile says

T-Mobile CTO says 5G's high-frequency spectrum won't cover rural America.

JON BRODKIN - 4/22/2019, 10:22 PM



T-Mobile

[Enlarge](#) / T-Mobile CTO Neville Ray.

For Sceptics (Blockchain, AI, Facebook, 5G, ...)

Demystification of tech. Actual value? Problems?

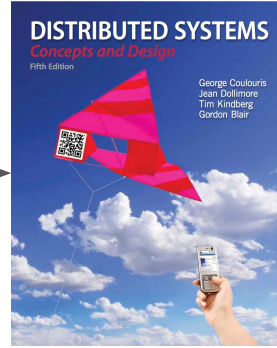
Questioning of agendas behind it

Creative response

Scepticism (evidence) vs cynicism (outlook)

Tradition in science, philosophy

about me



distributed / mobile / pervasive / urban computing

What is 5G?

Technologies to supercede 4G mobile data

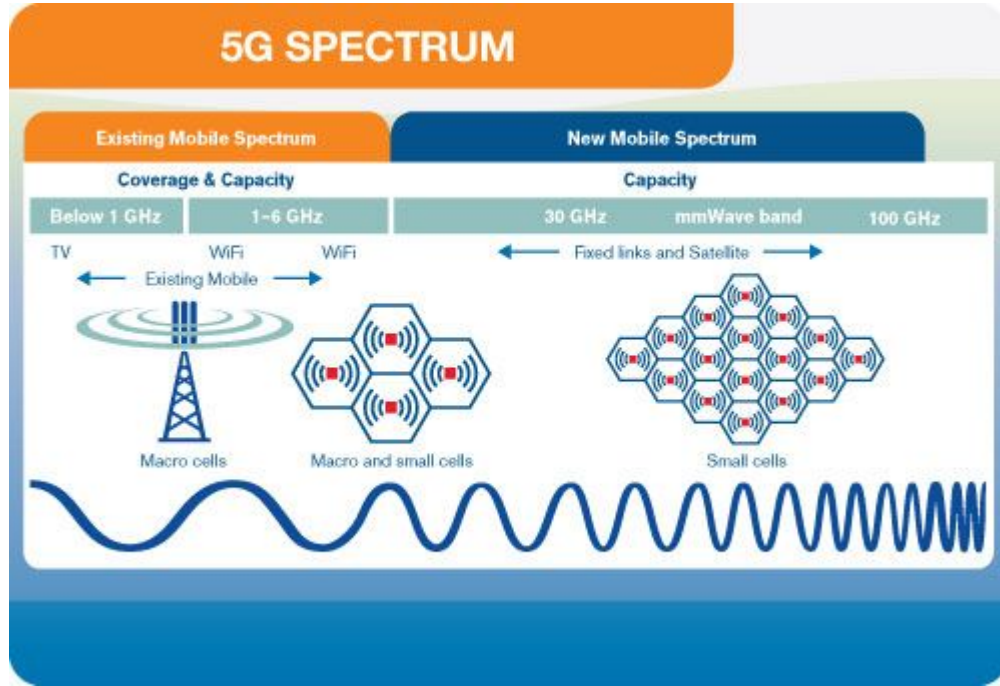
"The country's biggest mobile network, EE, has announced that it will be launching a 5G network in London, Cardiff, Edinburgh, Belfast, Birmingham and Manchester in the summer – so presumably around the middle of the year, and that a further ten cities will get 5G by the end of 2019."

Faster downloads
Better responsiveness
More devices connected

(with new infrastructure & phones)

How?

Using a different part of the radio spectrum



Millimetre waves



Small cells

Use radio more efficiently

SLICING



'Massive MIMO' (every cell has dozens of antennae)



Beamforming (focus radio transmission)



Full duplex (simultaneously transmit and receive)

Why?

Faster downloads, stream more data

Network type	Max download speeds	Time to download full HD film
3G	384Kbps	Over a day
4G	100Mbps	Over 7 minutes
4G+ (4.5G)	300Mbps	2.5 minutes
5G	1-10Gbps (theoretical)	4-40 seconds



Greater capacity



INTERNET of THINGS

communicate

INTERNET of THINGS

communicate

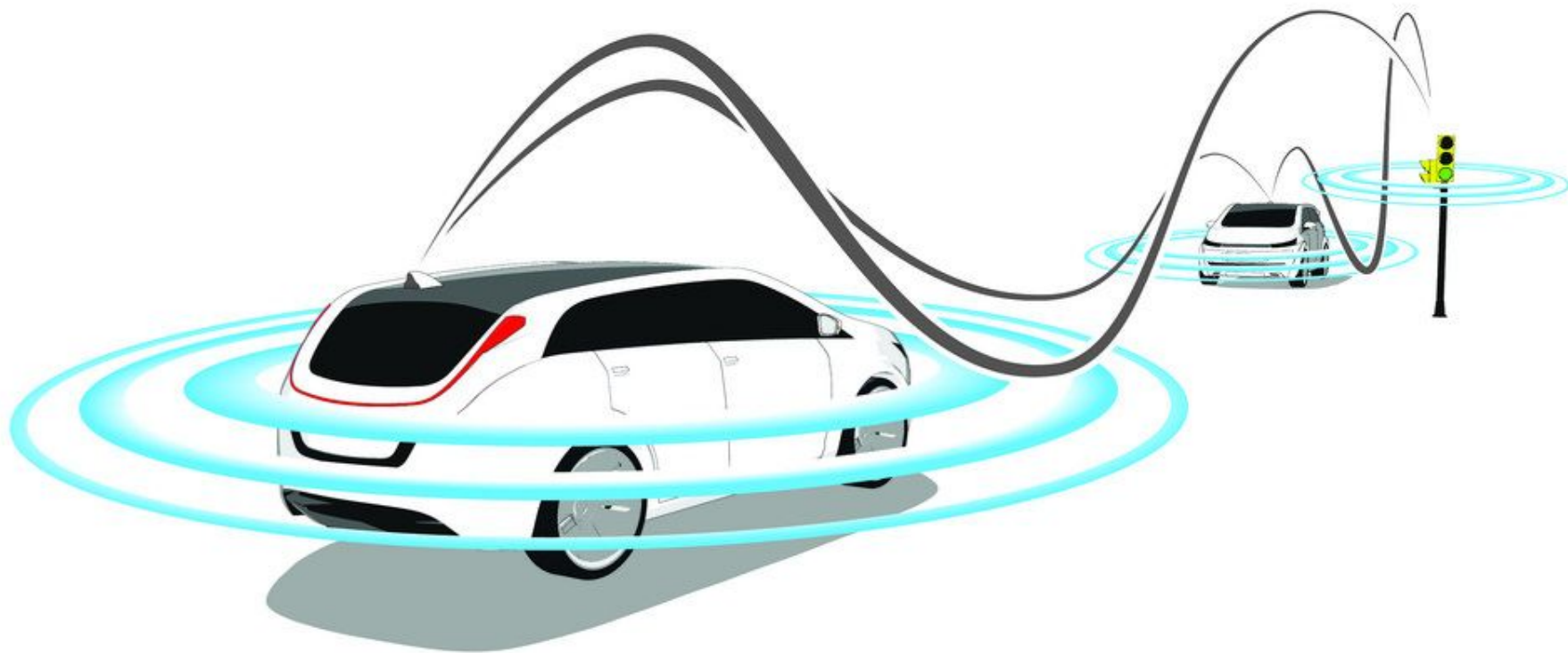
Greater reliability, lower latency (comms delay)*

Network Type	Approx. latency (ms)
3G Network	65ms (actual)
4G Network	40-50ms (actual)
5G Network	1ms (theoretical)

*to cell tower

5G

Real-time control



The players & the issues

ARTISTS RESEARCHERS PUNKS

In all of this there's

You (media consumer/producer, citizen, ...)

Media platforms (BBC, Netflix, ...)

Verticals (automotive, telesurgery, smart homes, ...)

'Smart City' merchants (Alphabet (google), IBM, ...)

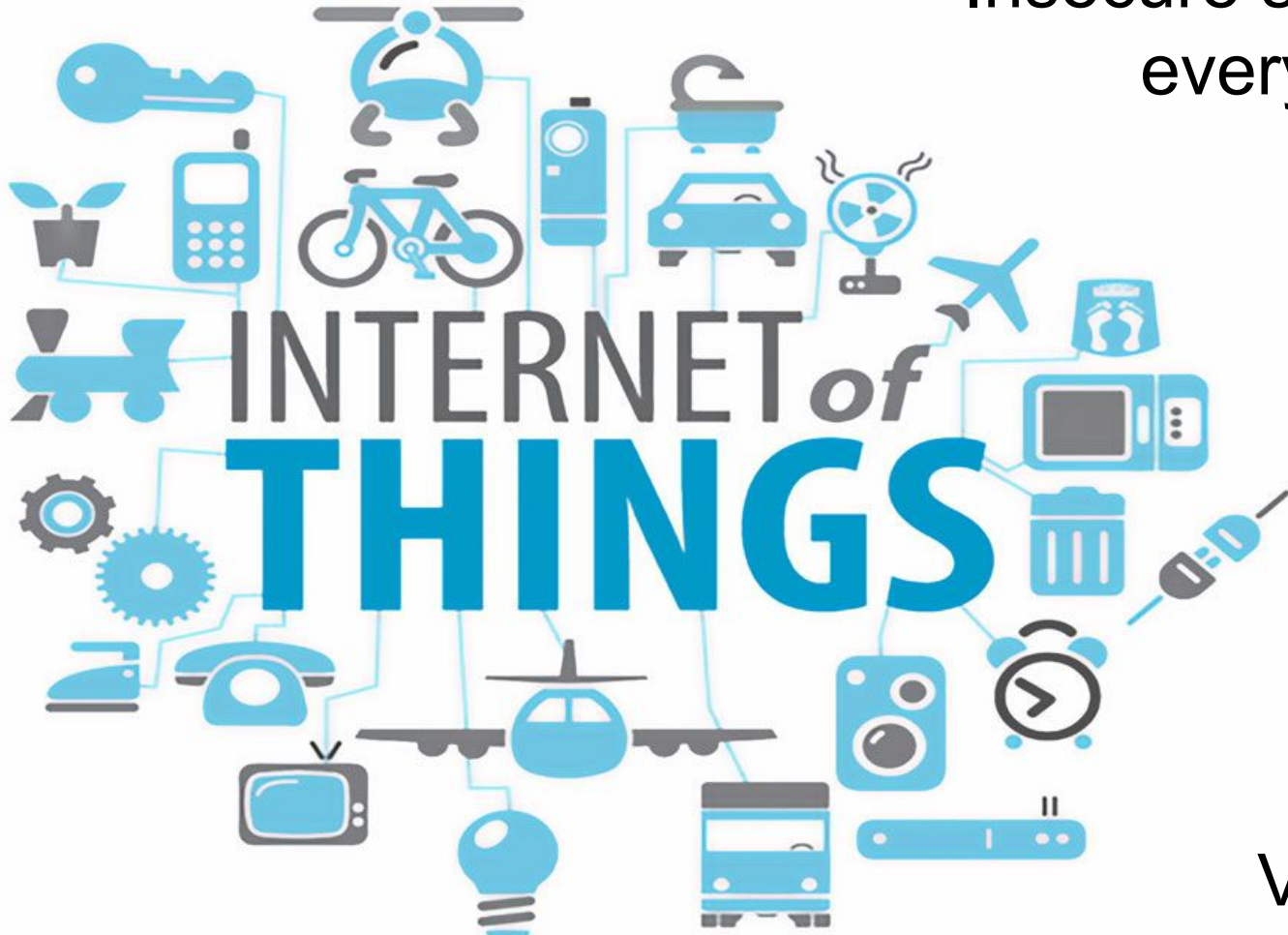
Telcos (Vodafone, EE, ...)

Infrastructure providers (Huawei, Nokia, ...)

Spies (GCHQ, NSA)



Insecure sensors everywhere



Value?

Leveraging IoT, Rwanda introduces smart street lighting system

👤 Nicholas Asingwire 🕒 January 29, 2019 📁 Tech



Image via everything RF

Rwanda is working on a new project that will give outstanding impetus to the country's agenda for a smart economy that has seen the birth of notable initiatives like [smart classrooms](#), [ePayment systems in the](#)

Nike says it's 'actively working' to fix its broken smart sneakers

No timeline on a fix, though

By Ashley Carman | @ashleyrcarman | Feb 21, 2019, 2:00pm EST

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New
failure modes



MOST R



Sky New Zealand yanks Sky
Christchurch footage sparks



“sensors have become a part of our daily lives.”

SIDE WALK LABS

HOME

TORONTO

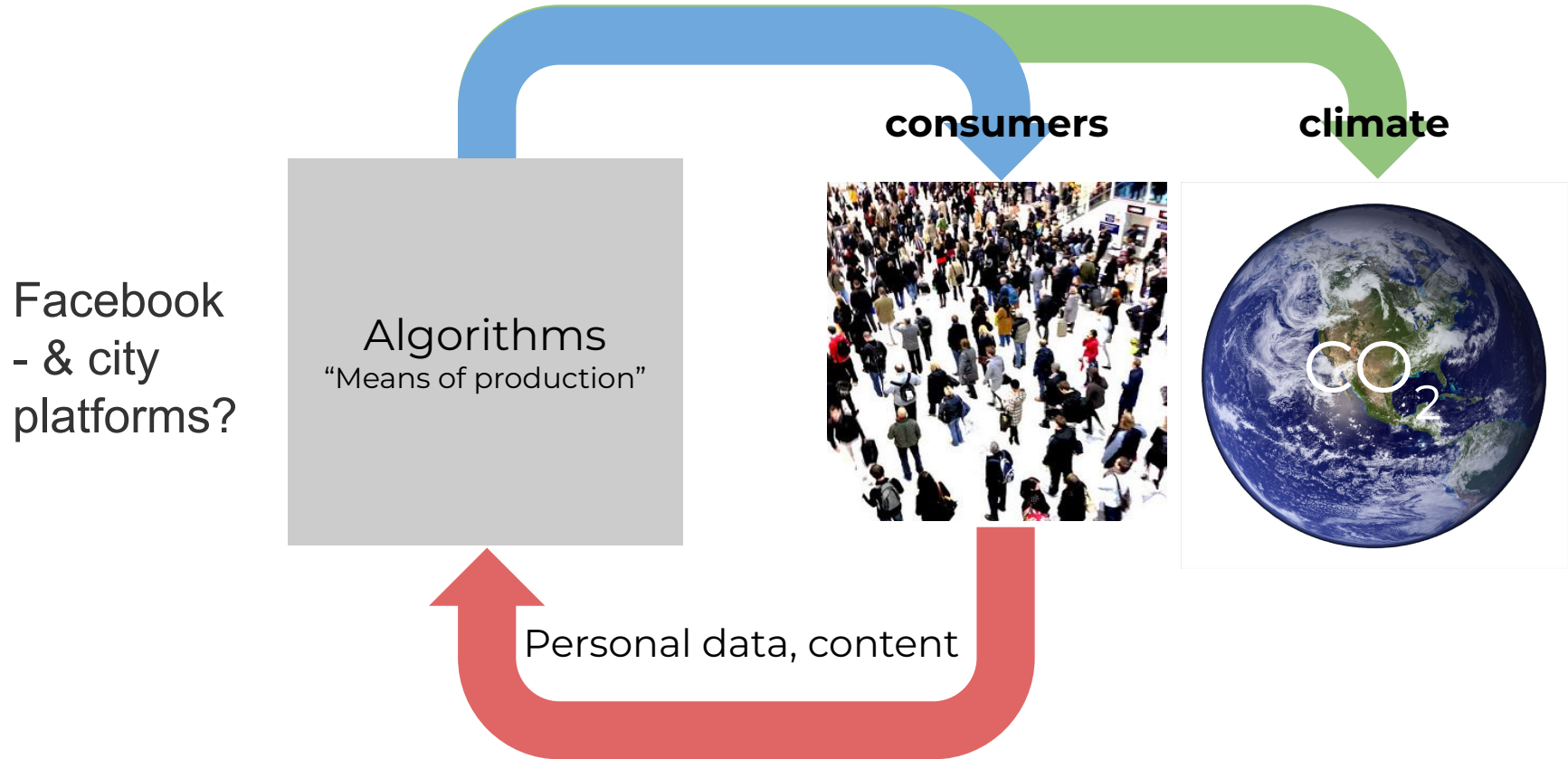
BLOG

TEAM

JOBS

**Sidewalk Labs is
reimagining cities to
improve quality of life.**

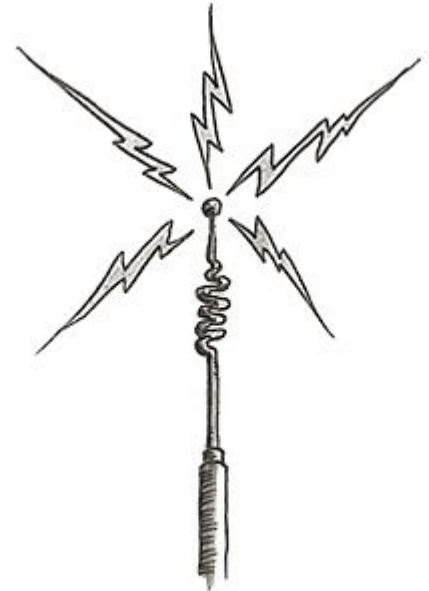
Surveillance capitalism




Health?

"Extensive research has been conducted into possible health effects of exposure to many parts of the frequency spectrum including mobile phones and base stations. All reviews conducted so far have indicated that exposures below the limits recommended in the ICNIRP (1998) EMF guidelines, covering the full frequency range from 0-300 GHz, do not produce any known adverse health effect. However, there are gaps in knowledge still needing to be filled before better health risk assessments can be made."


<http://www.who.int/peh-emf/research/en/>



WHO's statement is disputed




Environmental Pollution
Volume 221, February 2017, Pages 501-505



Letter to the Editor

When theory and observation collide: Can non-ionizing radiation cause cancer? ☆

Magda Havas B.Sc., Ph.D. 

[Show more](#)

<https://doi.org/10.1016/j.envpol.2016.10.018> [Get rights and content](#)

Highlights

- There is sufficient scientific evidence of cellular damage caused by NIR well below thermal guidelines.
- Applying the ionization model to non-ionizing radiation is inappropriate as mechanisms of biological interactions differ.
- Free radicals can and do cause cancer and non-ionizing radiation can and does increase free-radicals.





Brussels halts 5G activity because of radiation concerns

News 12 Apr 2019 by SmartCitiesWorld news team

The regional government is concerned that 5G technology can't measure the radiation levels from 5G antennas.





Governmental Surveillance?

NEWS / SCIENCE & TECHNOLOGY

UK spy chief raises concerns over use of Huawei for 5G rollout

Concerns over 'monopoly supplier' warrant 'proper conversation', head of MI6 says at Munich Security Conference.

15 Feb 2019



Espionage

"even as the United States made a public case about the dangers of buying from Huawei, classified documents show that the National Security Agency was creating its own back doors — directly into Huawei's networks."

**The
New York
Times**



Extensive use of
'backdoors' by
NSA, GCHQ

EDWARD SNOWDEN

Former NSA intelligence officer turned
whistleblower

NEWS

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US and UK accused of hacking Sim card firm to steal codes

20 February 2015



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GETTY IMAGES

The stolen encryption keys allowed agencies to decode data that passes between mobile phones and cell towers

Creative response

Layered Realities



Ice crowd (experiences for crowds)



"I'm looking at my phone all the time, and it's a singular experience, it's about me and my device, whereas this work is about your device and how that connects you to other people in a real way, in a live way."

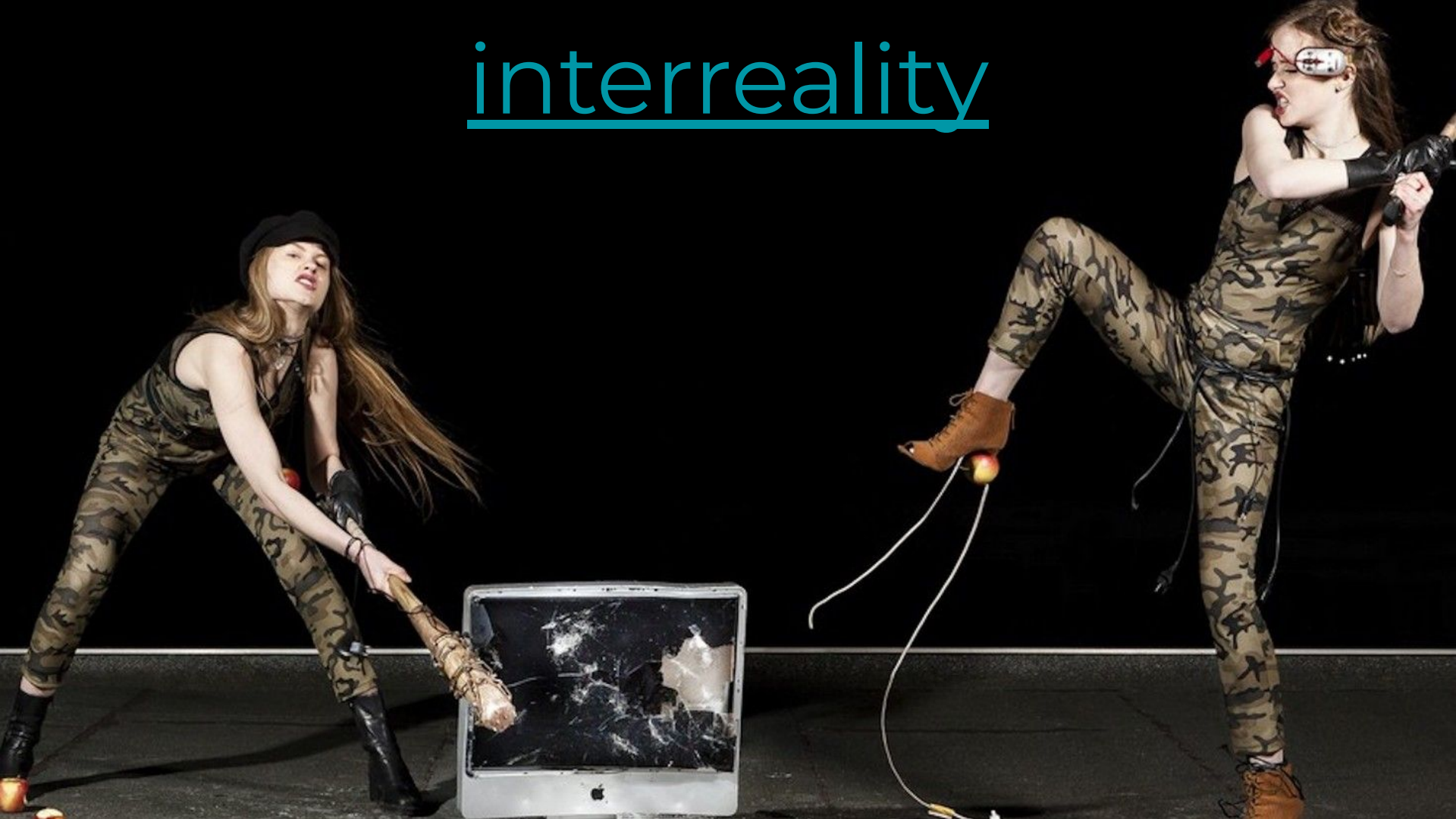
Audience member

Extending touch via the (5G) internet?



Stuart Nolan's One Thousand Mind
Readers project, a Layered Realities
5G Fellows talk (2018)

interreality



Digital-Physical Hybrid Overlay Dialectic

Urban Creative Resistance



Punk City

Citizens:

- Answering their own questions
- Architecting their own physical/digital interventions and provocations
- E.g. their own network, own soundsystem-as-mediaserver

Will 5G support inclusive access?





Thank You!

tim@matter2media.com
@timkindberg

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