Looking into the future, what can we learn about hacking in science-fiction?



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Summary

Why imaginaries are so interesting?

Macro analysis

What does science fiction tell us about hacking?

Science fiction versus facts, any differences?

So, how do we use science fiction?

What are tomorrow's projections?

Everyone knows what imaginaries are.

Few people realize how much it shapes us.

Why Imaginaries?

Methodological approach

What's the link between "science fiction" and "science facts"? A feedback loop

Imaginaires displays usages and technologies

Technologies, designers & engineers are inspired by what is displayed and work in order to produce the stuff in real life



R/D displays forthcoming technologies

Authors speculate regarding the consequences and usages of the R&D

Methodological approach

What's the link between "science fiction" and "science facts"?



YouTube: search for « Slaughterbots » by DUST


Does Science Fiction Affect Political Fact? Yes and No: A Survey Experiment on "Killer Robots"

Kevin L. Young and Charli Carpenter
University of Massachusetts Amherst


It's the End of the World and They Know It: How Dystopian Fiction Shapes Political Attitudes

Published online by Cambridge University Press: 23 November 2018


Rethinking the Political / -Science- / Fiction Nexus: Global Policy Making and the Campaign to Stop Killer Robots

Charli Carpenter

The messages simply generate awareness of their problems by playing on the cognitive dissonance between science "fiction" and political "fact". Popular culture is used strategically to "hook" advocacy targets into a conversation that then remains rooted in the substance of the real world. Cultural resources thus enable and inform activists' activities vis-à-vis their targets, be they stakeholders, allies or opponents.

We thus obtain proof that the message has an impact: the consumption of more frightening and apocalyptic killer robot stories correlates with greater opposition to autonomous weapons.

The results of three experiments are striking: we find consistent evidence that dystopian narratives reinforce the willingness to justify radical - particularly violent - forms of political action. Yet we find no evidence for the conventional wisdom that they reduce political trust and effectiveness, showing that the effects of fiction may not be what they seem, and underlining the need for political scientists to take fiction seriously.

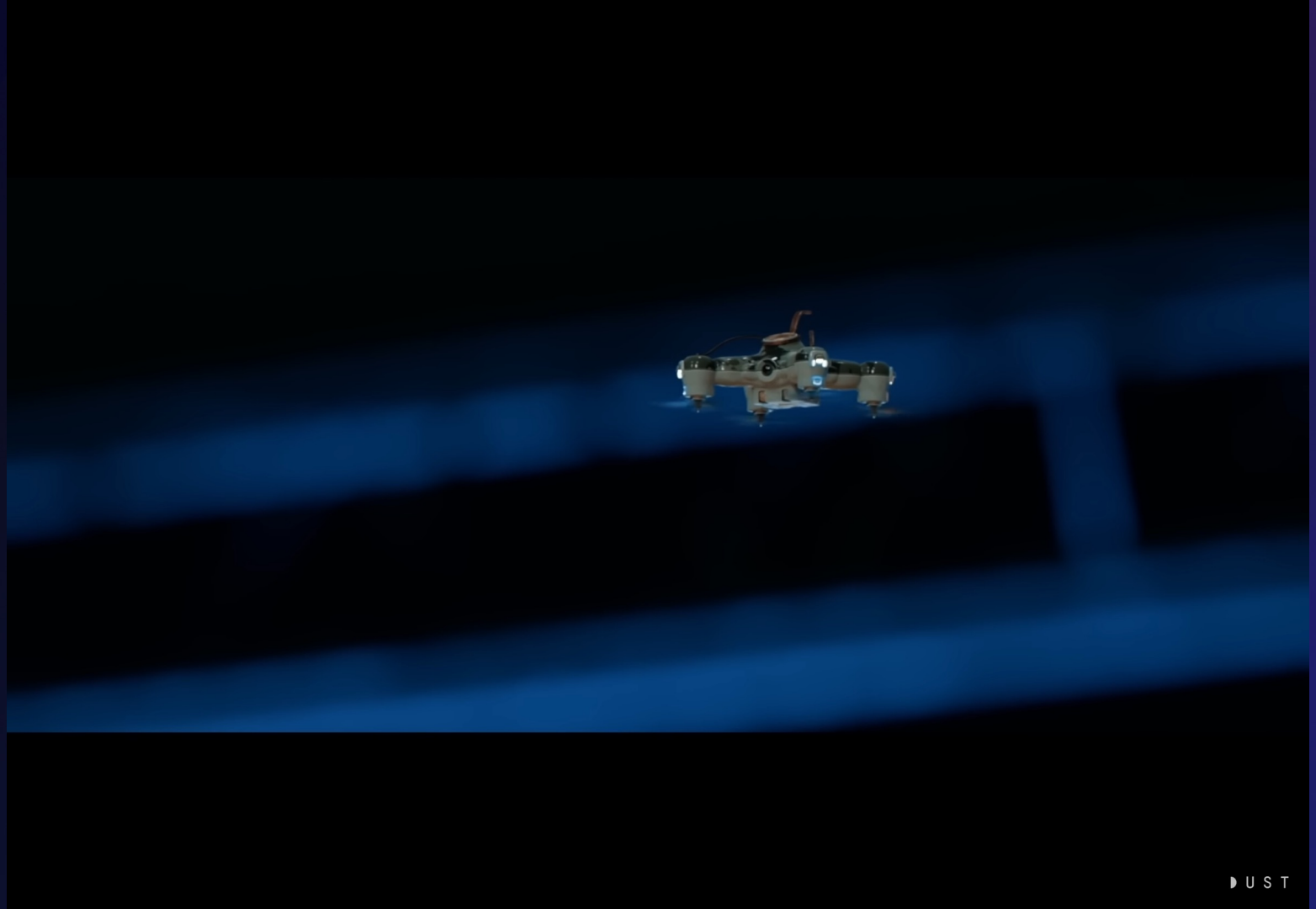


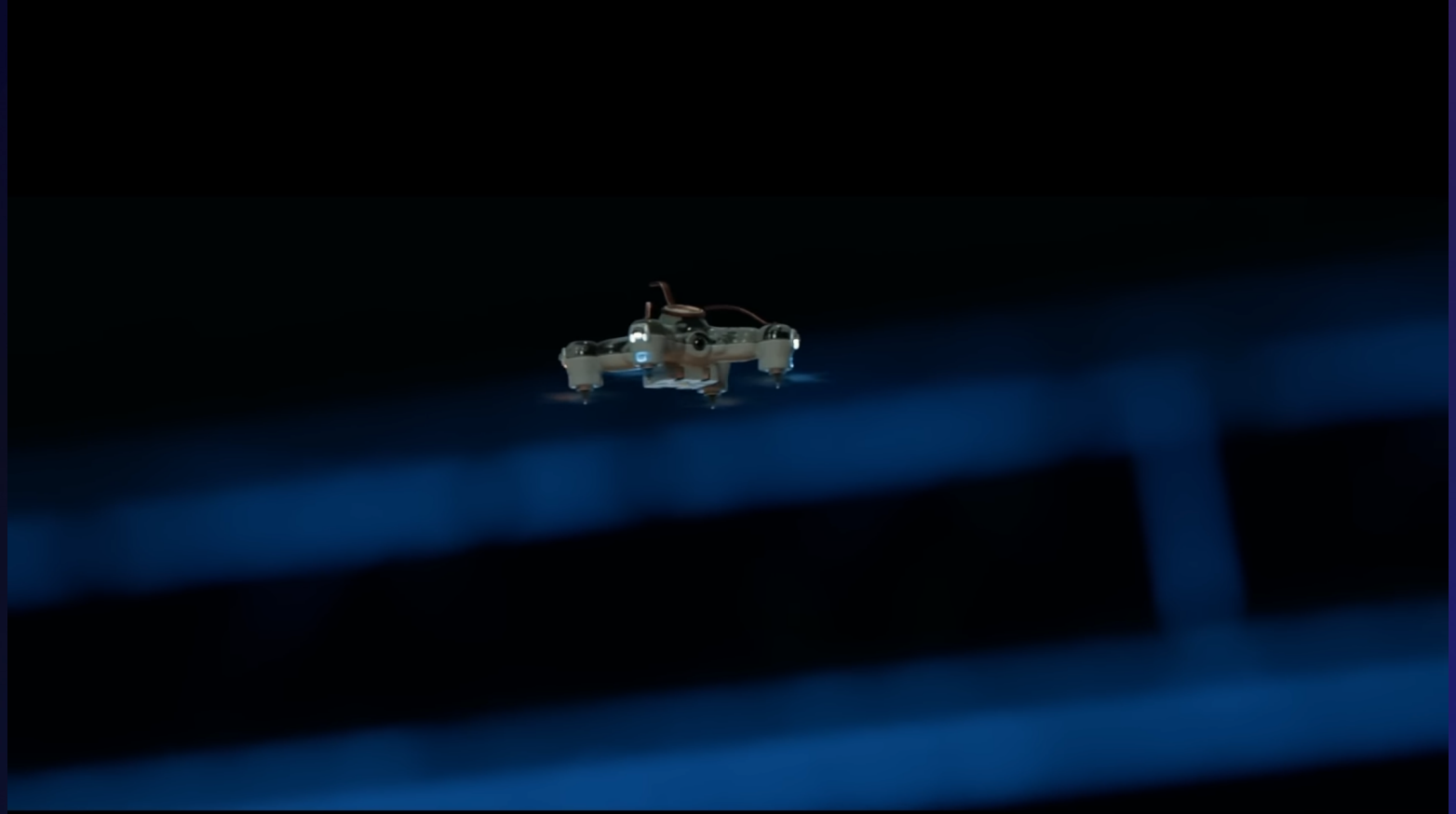
Customer pilots directed almost 3,000 precision strikes last year we're super proud of it.

DUST



It allows you to separate the bad guys from the good. It's a big deal.


DUST

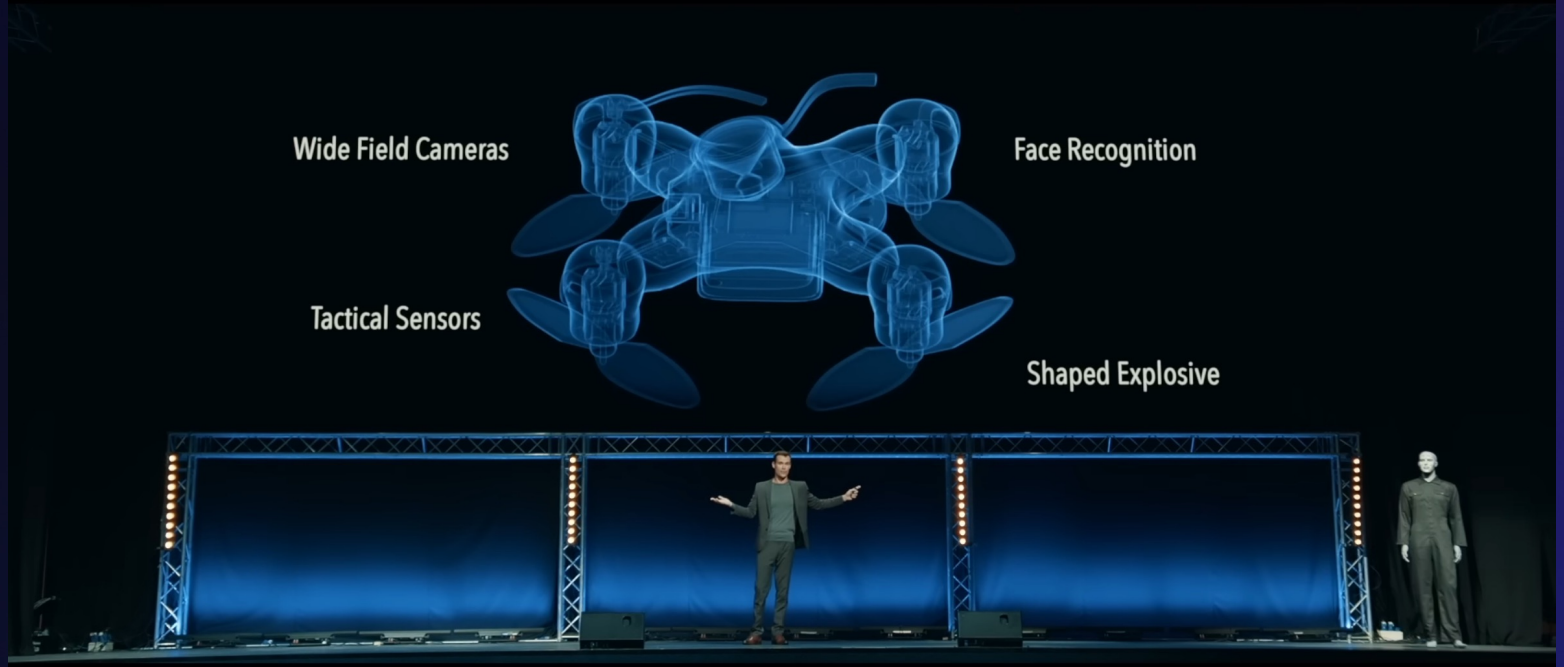


The stochastic motion is an anti-sniper feature.



it has cameras and sensors. And just like your phones and social media apps, it does facial recognition.

DUST



This is how it works?





Now that is an airstrike of surgical precision.



which officials are describing as some kind of automated attack, which killed 11 US senators at the Capitol building?


MENU
DEVICE
N
MAU


LIVE
LATEST: 8,300 STUDENTS KILLED. 12 UNIVERSITIES HIT
The search for a motive is apparently turning to social media and a video shared by the victims
DUST



I’m Stuart Russel, a professor of computer science at Berkley. I’ve worked in AI for more than 35 years.

It shows the results of integrating and miniturizing technologies that we already have.

It’s potential to benefit humanity is enormous, even in defense.

But allowing machines to choose to kill humans will be devastating to our security and freedom.

Thousands of my fellow researchers agree.

We have an opportunity to prevent the future you just saw, but the window to act is closing fast.

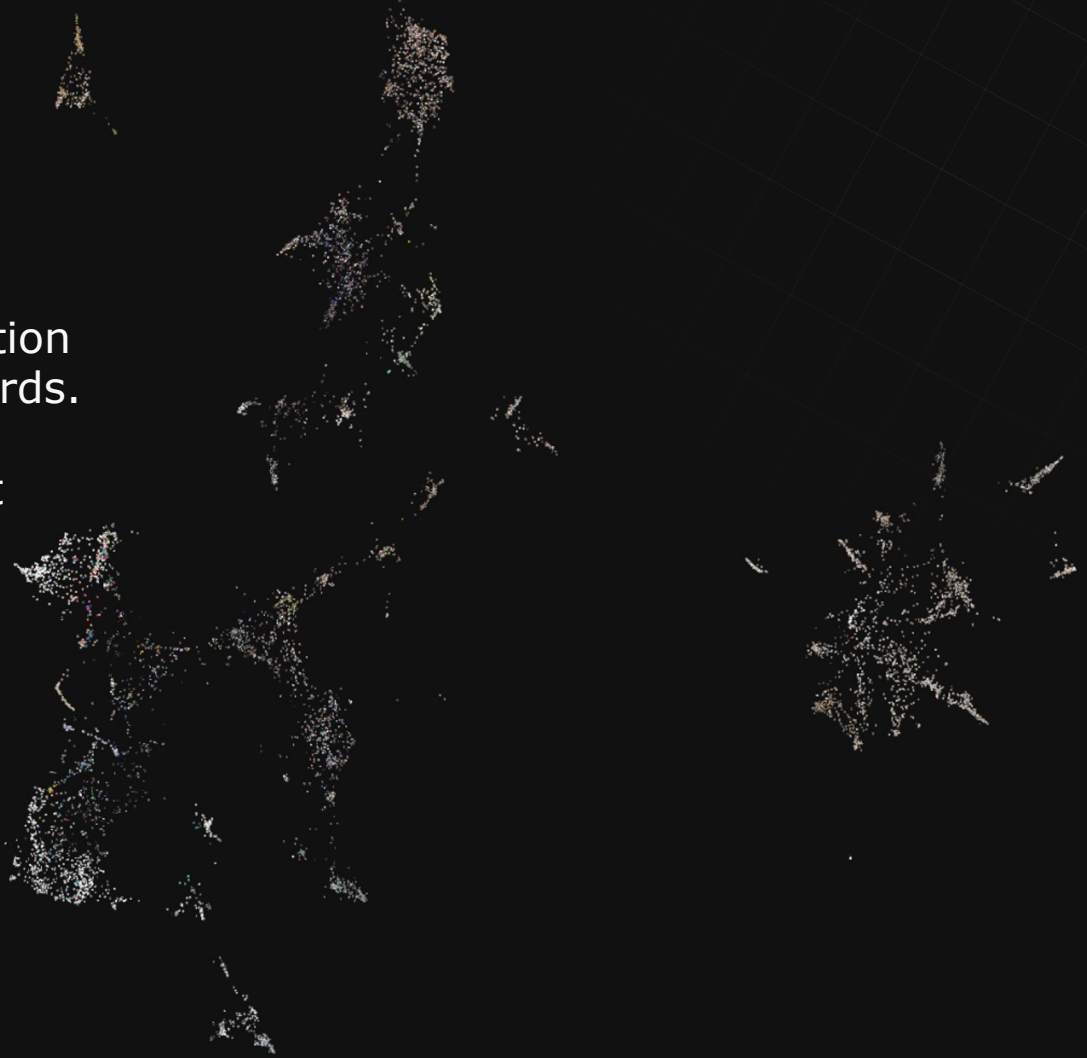
Imaginations of the future shape research and politics agendas in the present

Macro analysis of Hacking in present imaginaries

Representation of « Hacking »

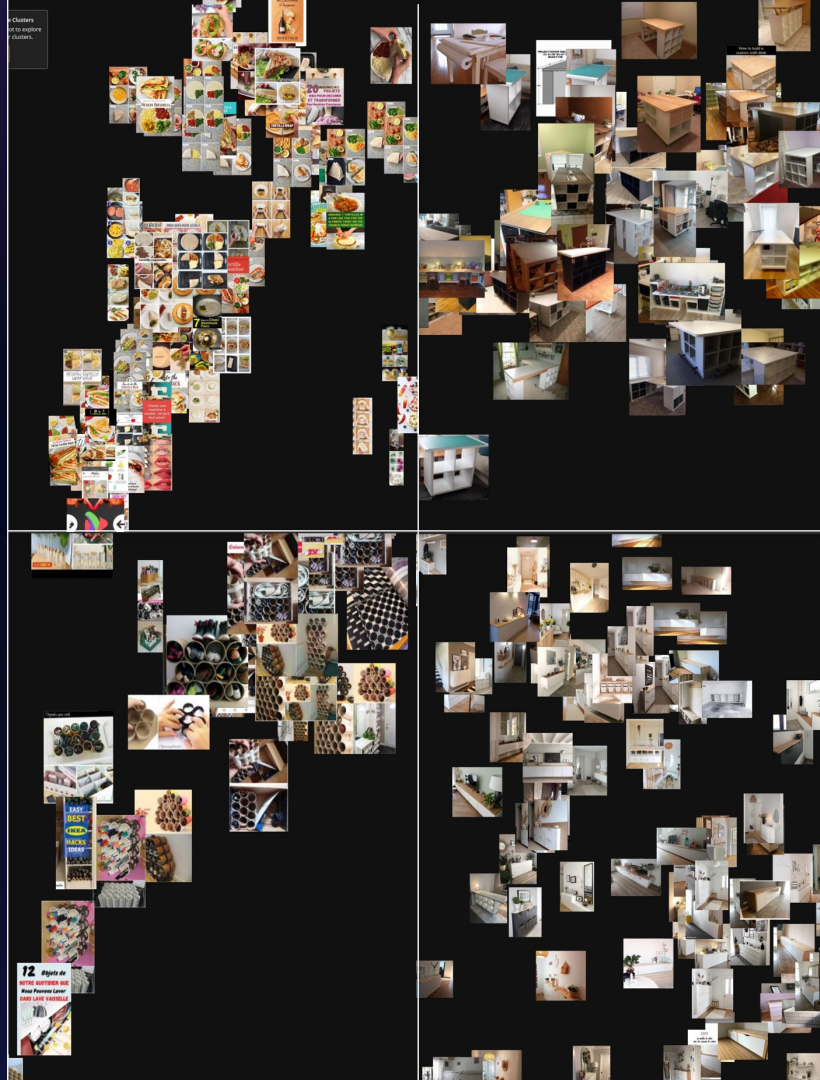
We crawled Pinterest, ArtStation and Shutterstock with keywords.

We used Yale DHLab’s PixPlot to map images.



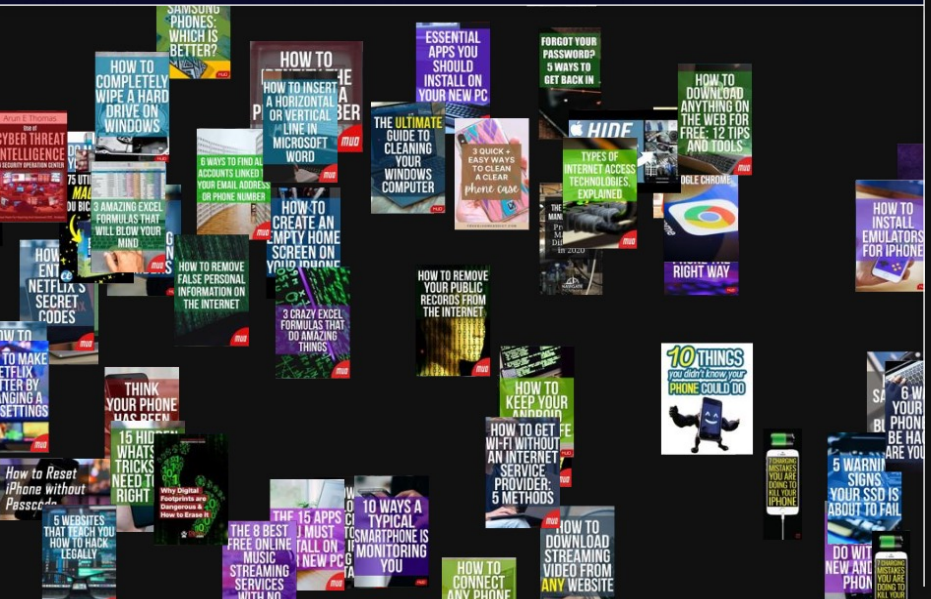
Representations of « hacking »

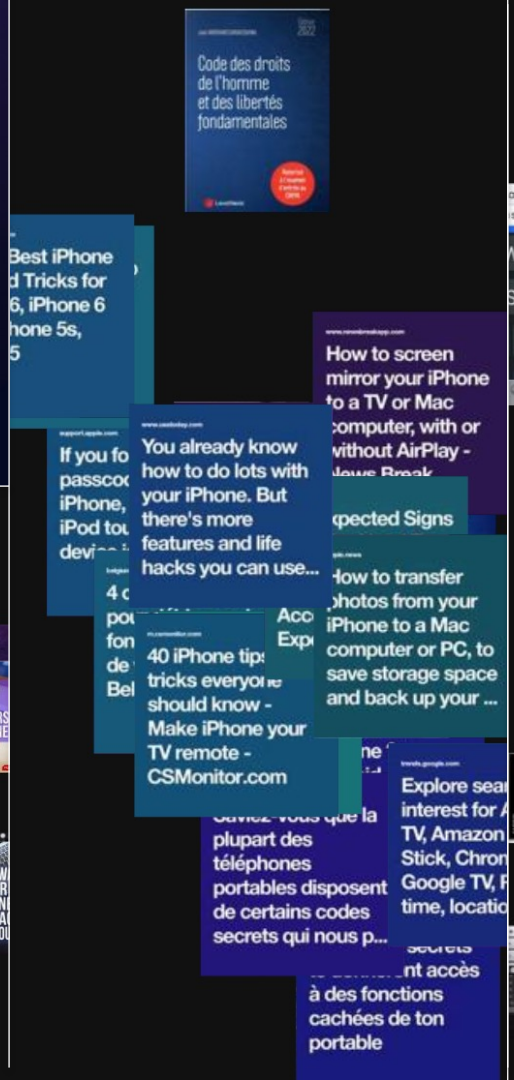
Appropriation of the term

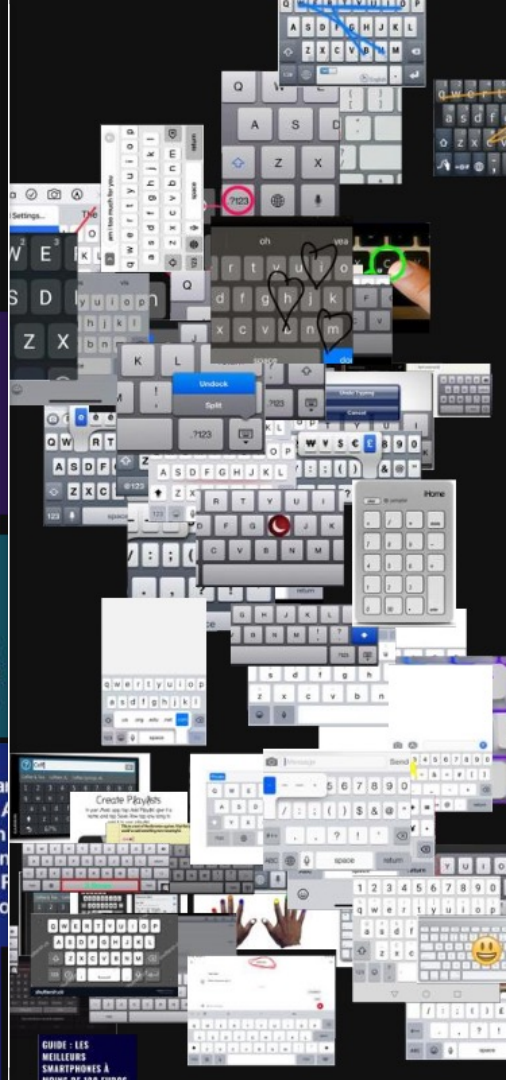


Representations of « hacking »

Simplistic visions of hacking





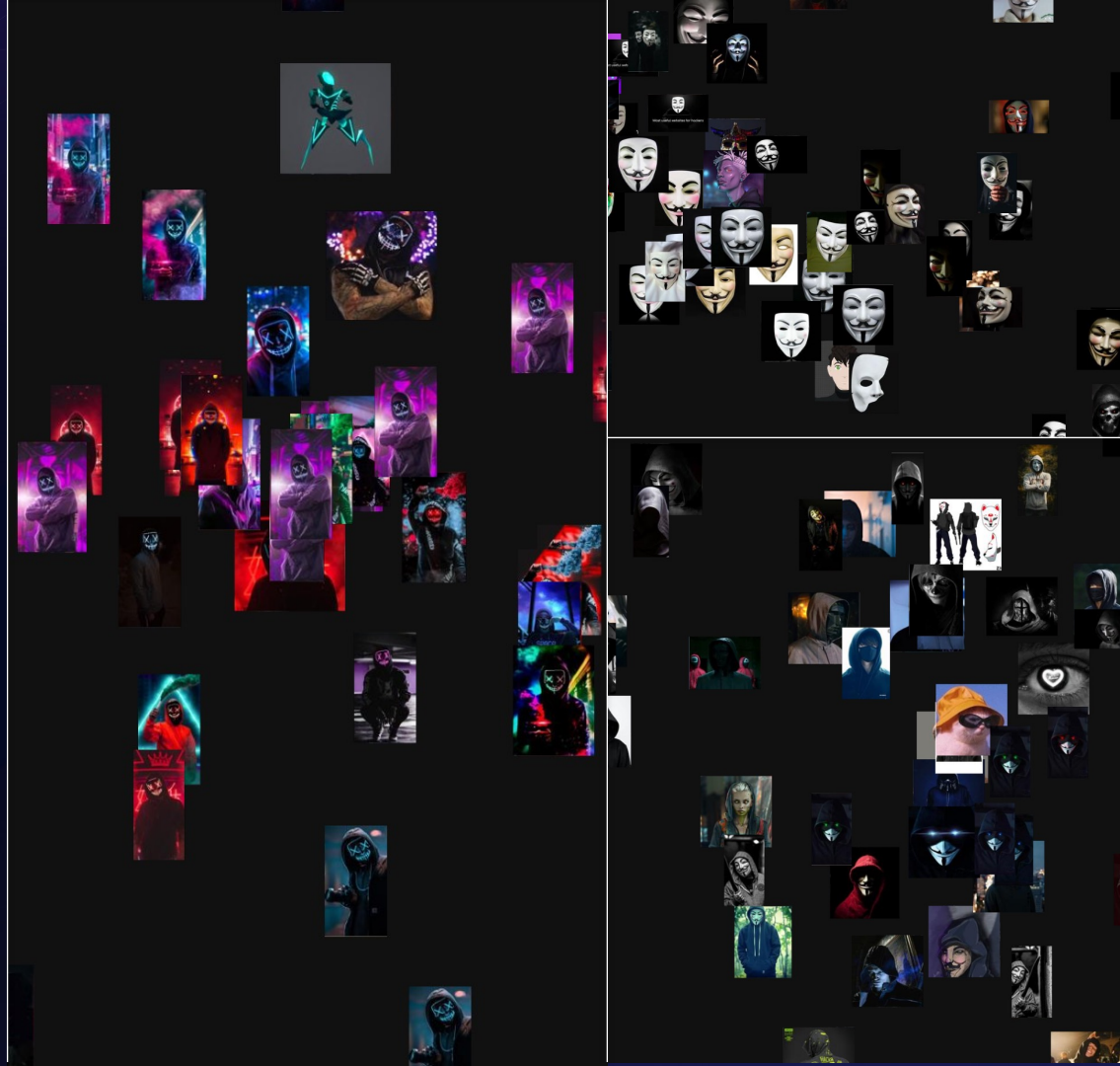




Representation of « Hacker »

Representations of « hacker »

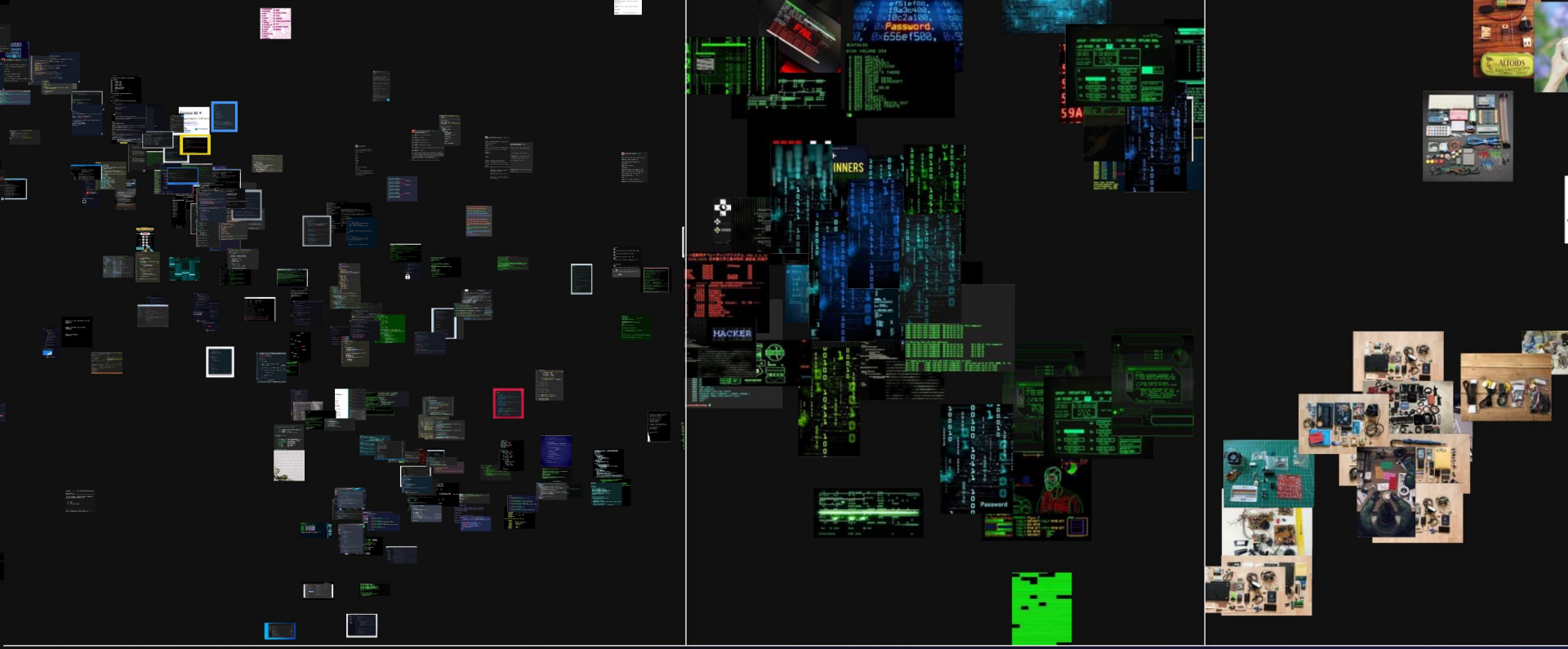
Strong archetypes





Representations of « hacker »

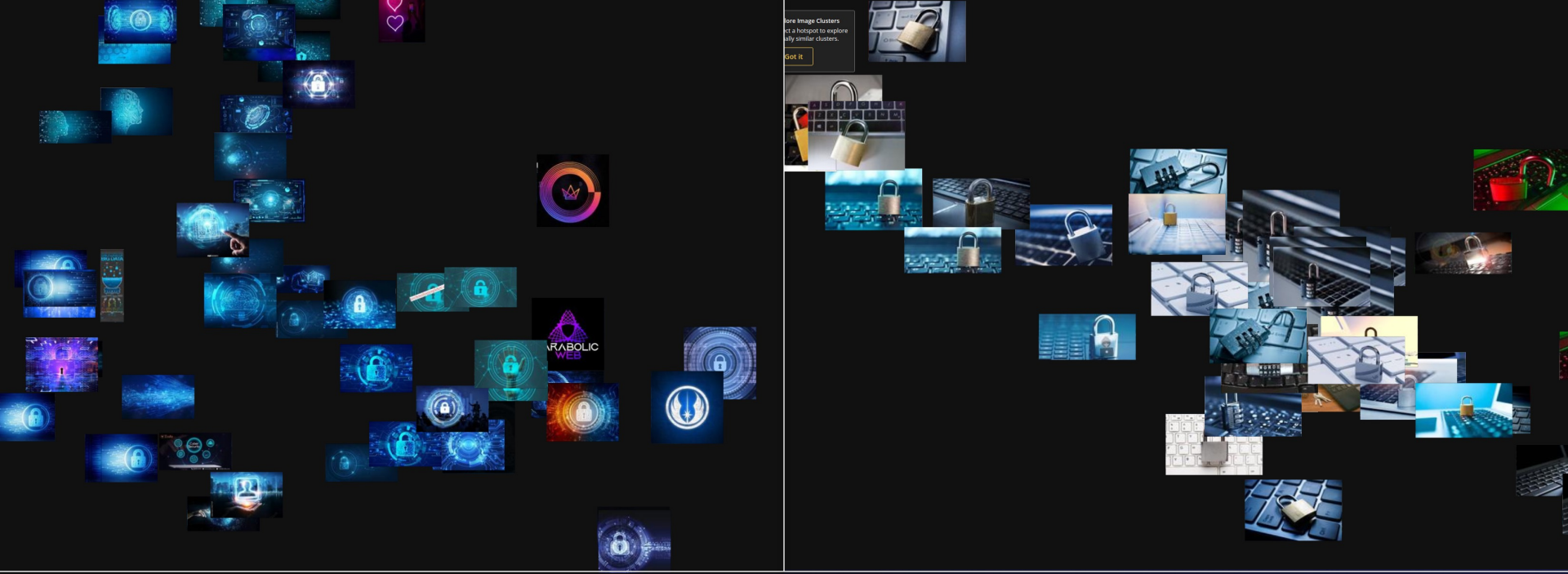
Strong archetypes



Representations of « hacker »

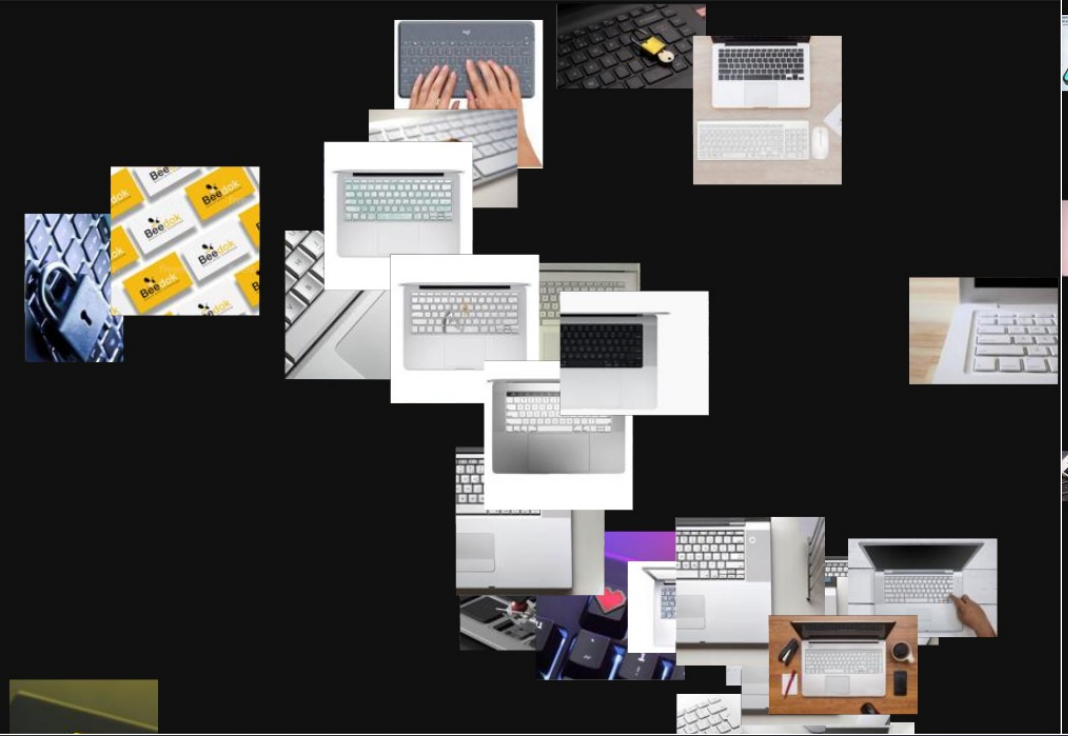
A more technical dimension

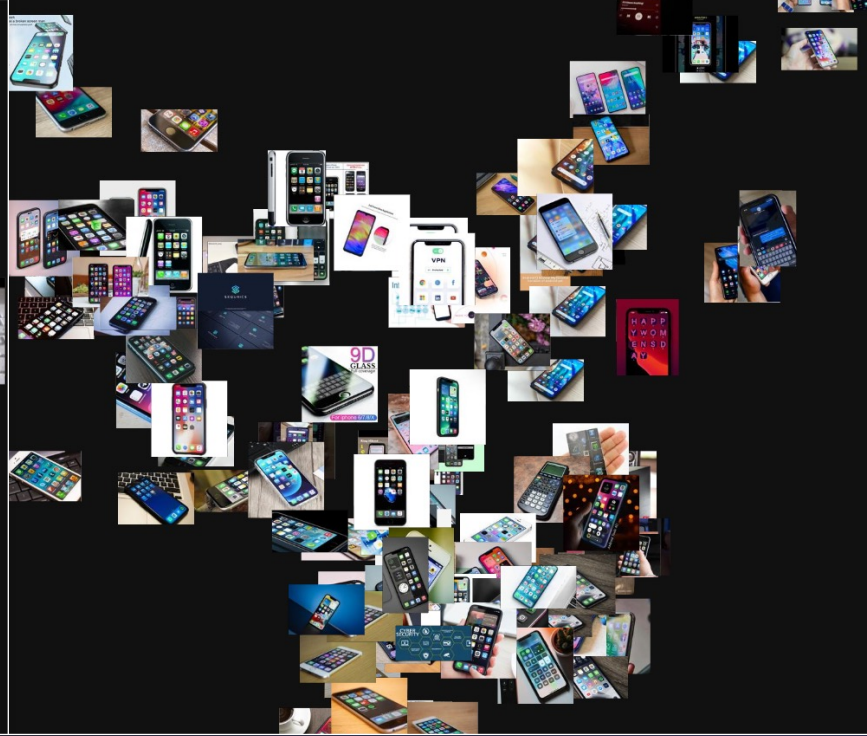

Representation of
« Cybersecurity »



Representations of « cybersecurity »

The eternal padlock

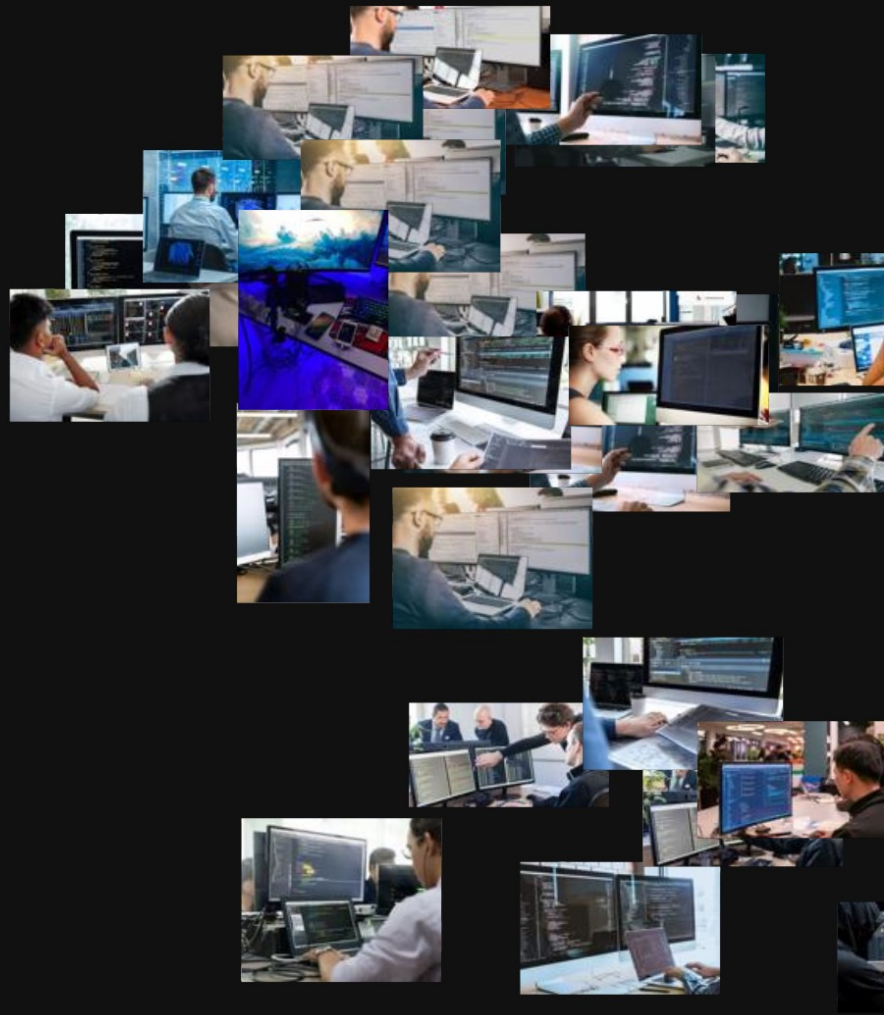




Representations of « cybersecurity »

Devices





Representations of « cybersecurity »

Humans

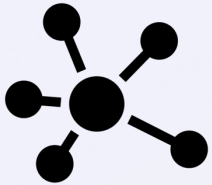
Caricatural representations











Using representations for a purpose: The IDEO and HP contest

01 Humanizing representations

- Go back to basics and explain that it's humans who compromise infrastructure, not circuit boards.
- Give a face to the "hacker hoodie".

02 Being accessible

- A highly complex subject that’s not easy to understand.
- Engage citizens by presenting simple, accessible elements.

03 Sounding the alarm without being alarmist

- Narratives based on fear and catastrophism do not allow us to focus on the causes of the problems, nor to approach the problem in a systemic way.

04 Accuracy is credibility

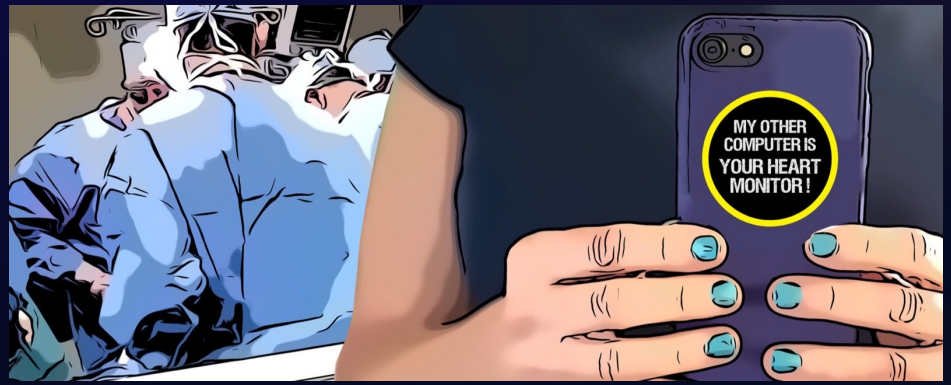
- Visuals must explain how things really work
- The difficulty lies in having imagery that is accessible to all, but that shares real technological fundamentals.

05 Metaphors for complex issues

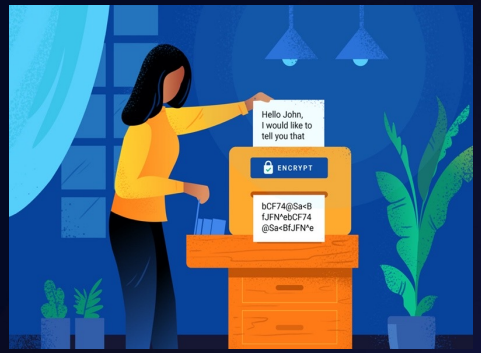
- How to make the invisible visible ?
- The main challenge here is to make issues such as encryption and privacy tangible.

Source : open IDEO * HP

Some of the results, trying to go further than « flatpacks futures » of Hollywood









Quantitative analysis

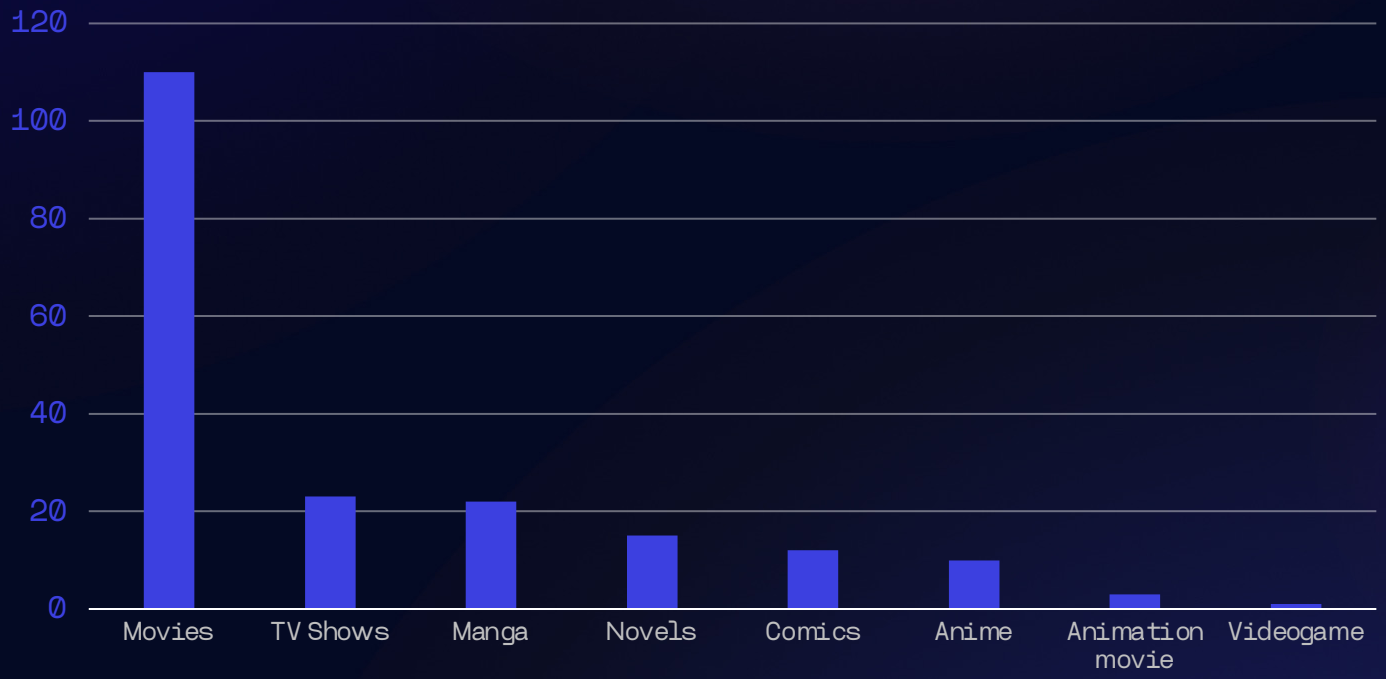
What does science fiction tell us ?

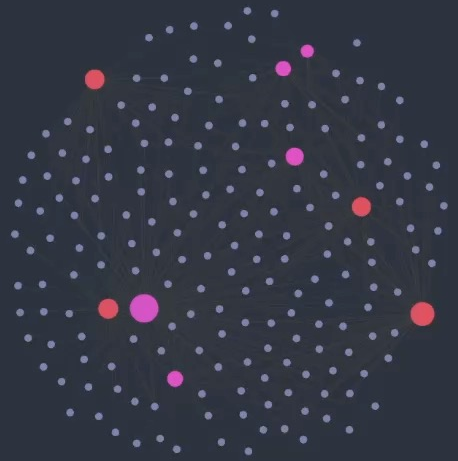
191 entries for fictions with 5 major variables

Title	Year	Media	Attack surface	Target	Hacker_type
The Italian Job	2003	Movie	Control center	Traffic Light	Independant
Neuromancer	1984	Novel	NaN	Data, AI	Independant
CSI: Cyber	2015	Series	Car	Car, Human Life	Independant
Homeland Season 2	2012	Series	Pacemaker	Pacemaker	Mafia, Terrorist Group
Wargames	1983	Movie	Control center	Missile Systems	Independant
Watch Dogs 2	2016	Videogame	Control center; Infrastructure	City Infrastructure, Traffic Light, Data, Money, Person	Independant
Johny Mnemonic	1995	Movie	Brain	Brain	Independant, Company, Mafia, Terrorist Group, AI or Robot
Ghost in the Shell	1989	Manga	Control center; Brain; Armor	Brain, Exoskeleton, Control Center	Independant, Hacker Group, State, AI or Robot, Company

The database

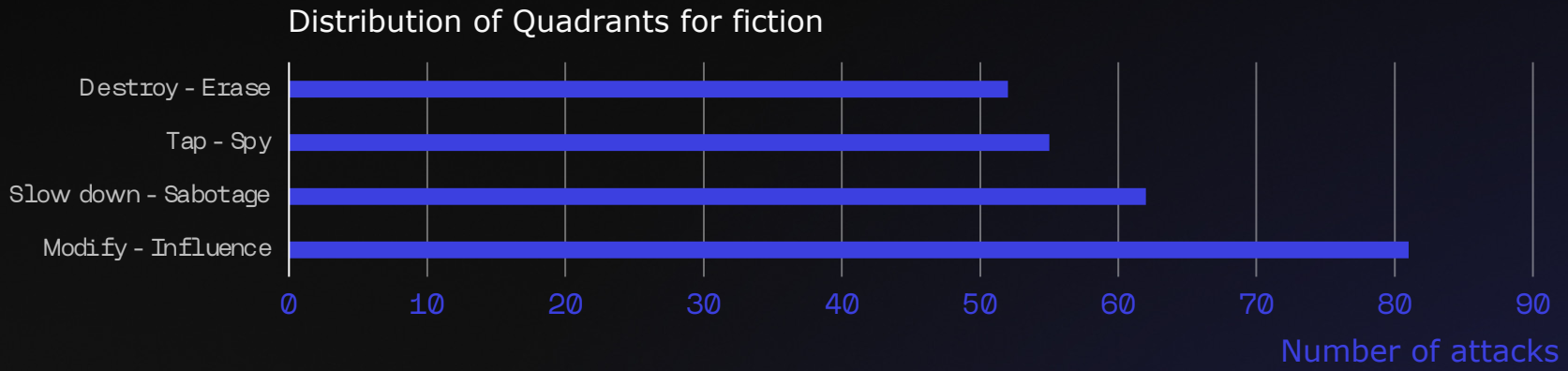
Distribution of media types

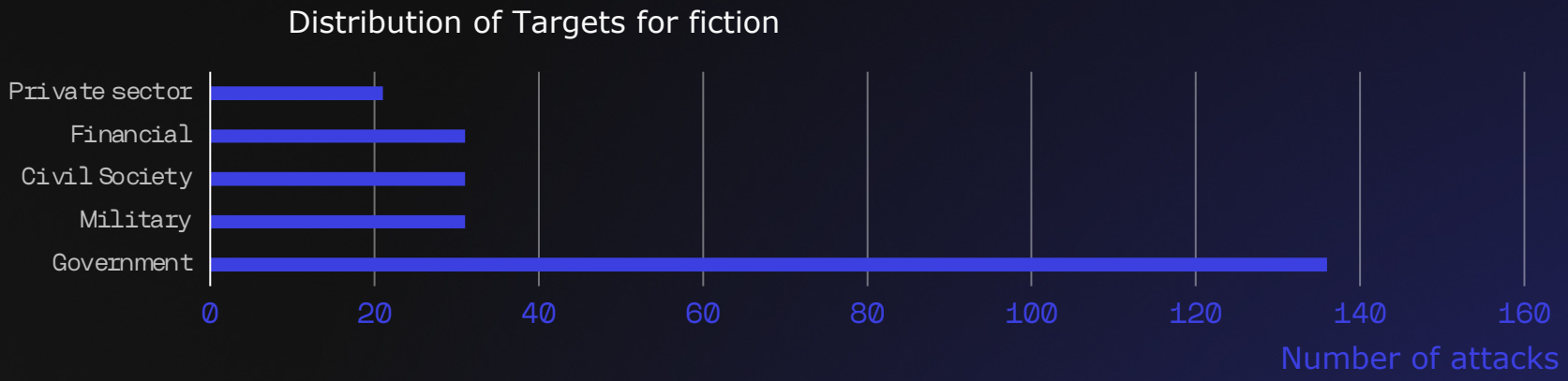




The database

What distributions for [quadrants] and [targets] ?





Quantitative analysis

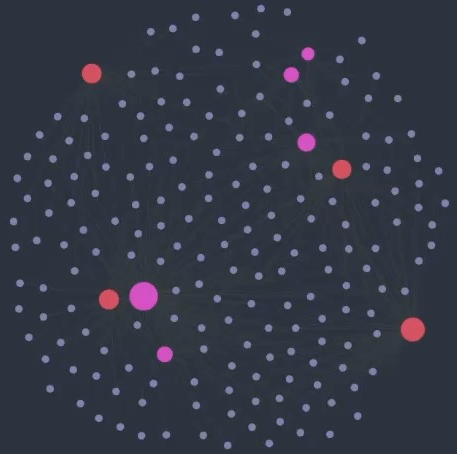
Science fiction vs. facts

976 entries for Reality

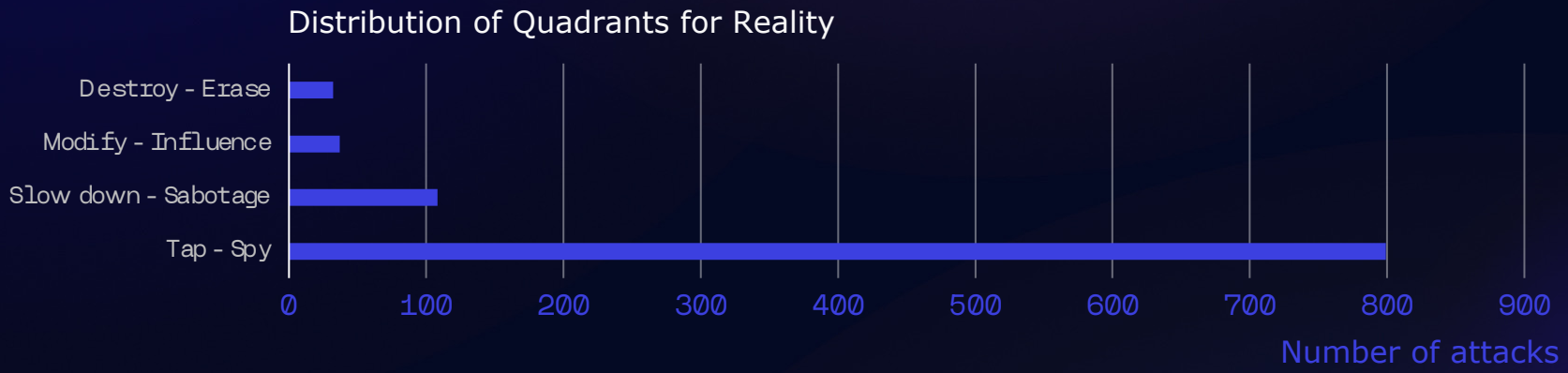
3 sources :

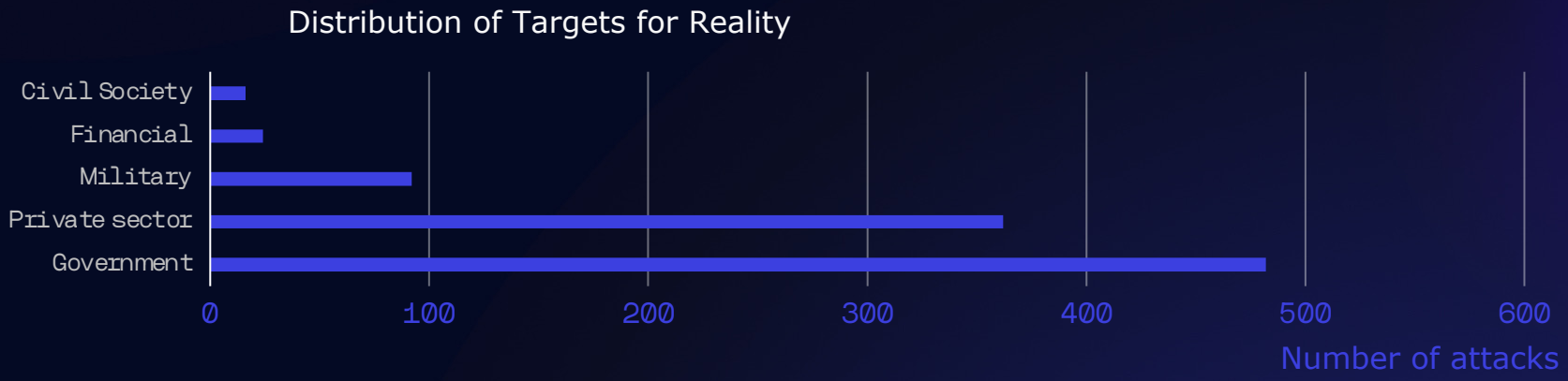
- US Council of Foreing Relations database
- The Cybercrime History Data Line by Robert Herjavec
- Interviews

Attacks	Date	Targets	Quadrant
French Telegraph System	1834	Financial	Tap - Spy
Switchboard Hack	1870	Private Sector	Modify - Influence
Early Telephone Calls	1878	Private Sector	Modify - Influence
Wireless Telegraphy	1903	Private Sector	Modify - Influence
Military Codebreaking	1939	Military	Tap - Spy



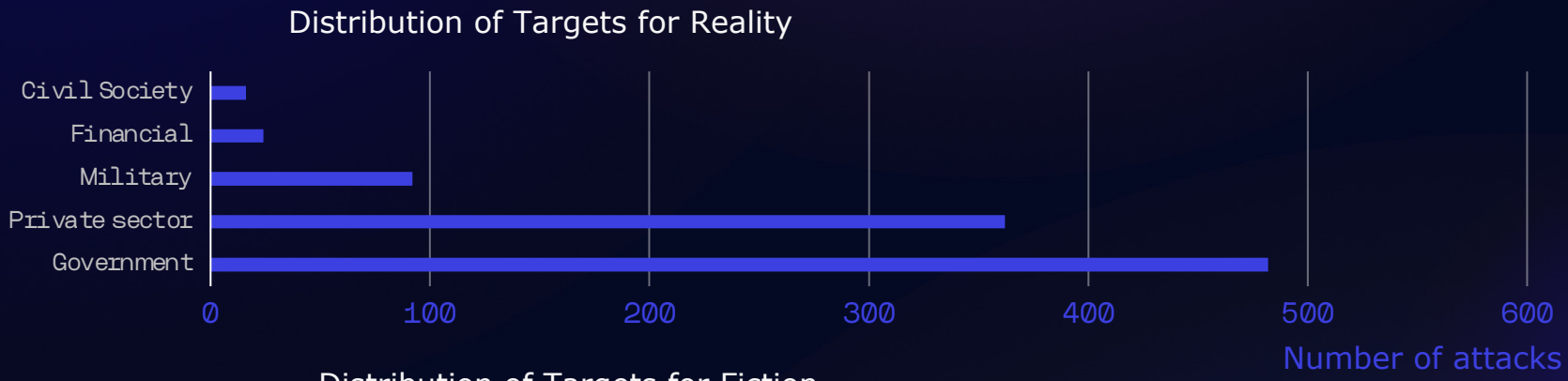
Reality : Distribution for quadrants and targets

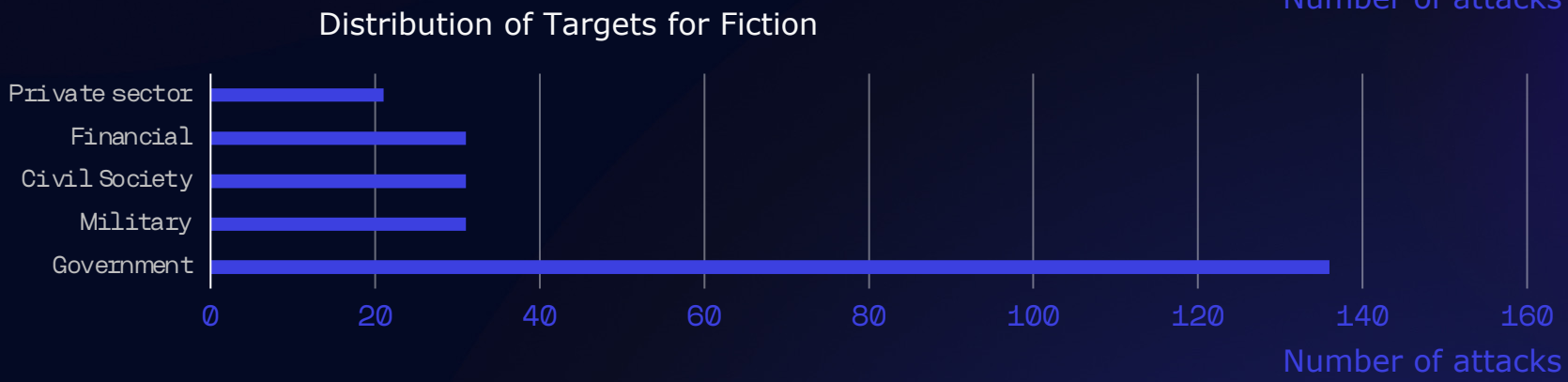




Targets: Reality compared to Fiction

Mind the bias : Reality dataset is declarative

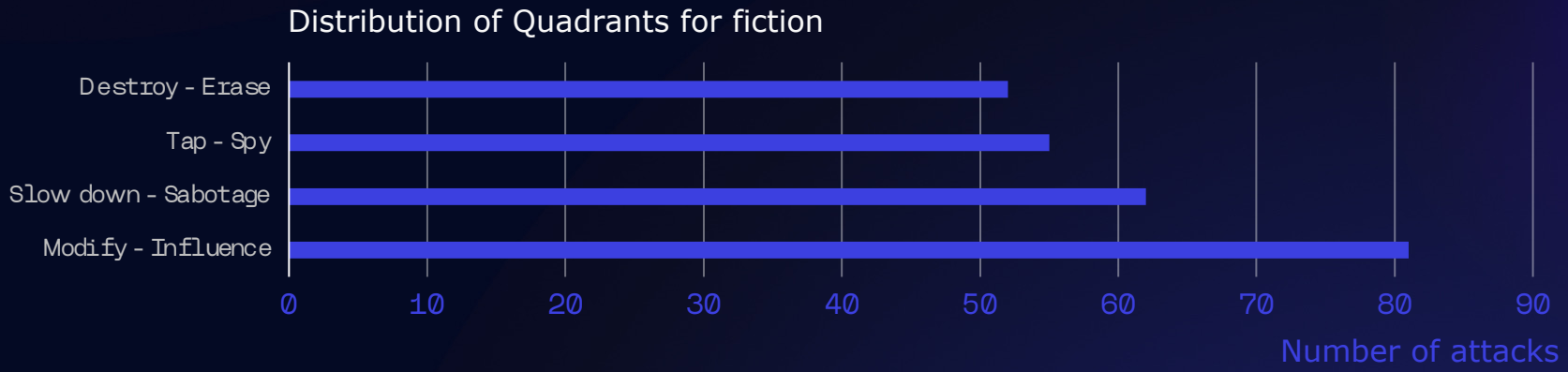




The database

Comparison [reality] * [fictions] for [quadrants]





But there is an inflexion point in reality around 2008/2010



2008
Explosion of Baku-Tbilisi-Ceyhan oil pipeline

Quick stop on 2 examples of physical world threats/attacks

- Hacking a Nuclear Power Plant
- Hacking a Pacemaker

Hacking a nuclear power plant

Fiction

1984 Hide and Seek movie
A college kid break into a canadian nuclear facilty



Reality

2010 Stuxnet attack destroy centrifuges of Natanz nuclear plant



Hacking a Pacemaker

Fiction

Dec 2012 Homeland TV Show
Murder of the US Vice President



Reality

2008 D. Halperin's paper « Pacemaker and Implantable Cardiac Defibrilators: Software Radio Attacks and Zero-Power Defenses »

2013 VP Dick Cheney remove the wireless features of his pacemaker
« I found it credible »
« It's an accurate representation of what's possible. »

2017 Recall of half a million
« hackable » pacemakers



2018 Pacemaker vulnerability demonstrated at BlackHat (*Jonathan Butts & Billy Kim)*
Threat reported to manufacturer in 2016

Ready for the last part?

Let’s finish on a positive vibe!

How can we use science fiction?

example of a qualitative innovation track

Cartographic representations



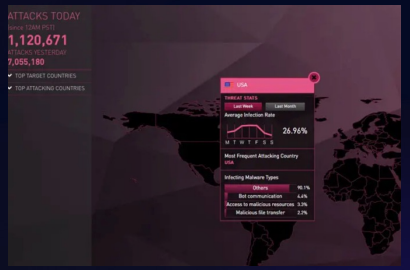
Kaspersky



Akamai



Arbor



Checkpoint



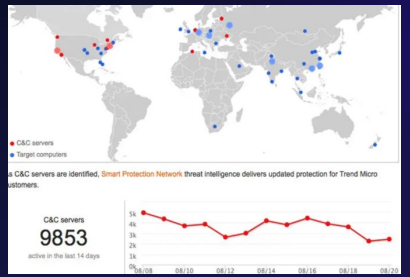
Fireye



Fortinet



Norse



Trend Micro

Cartographic representations

Strong science fiction references

Kaspersky



Fireye



Norse





Colossus: The Forbin project (1970)

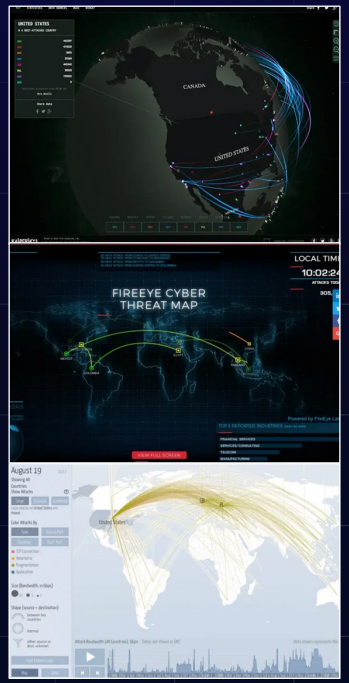
Cartographic representations

Strong science fiction references

Kaspersky

Fireye

Arbor

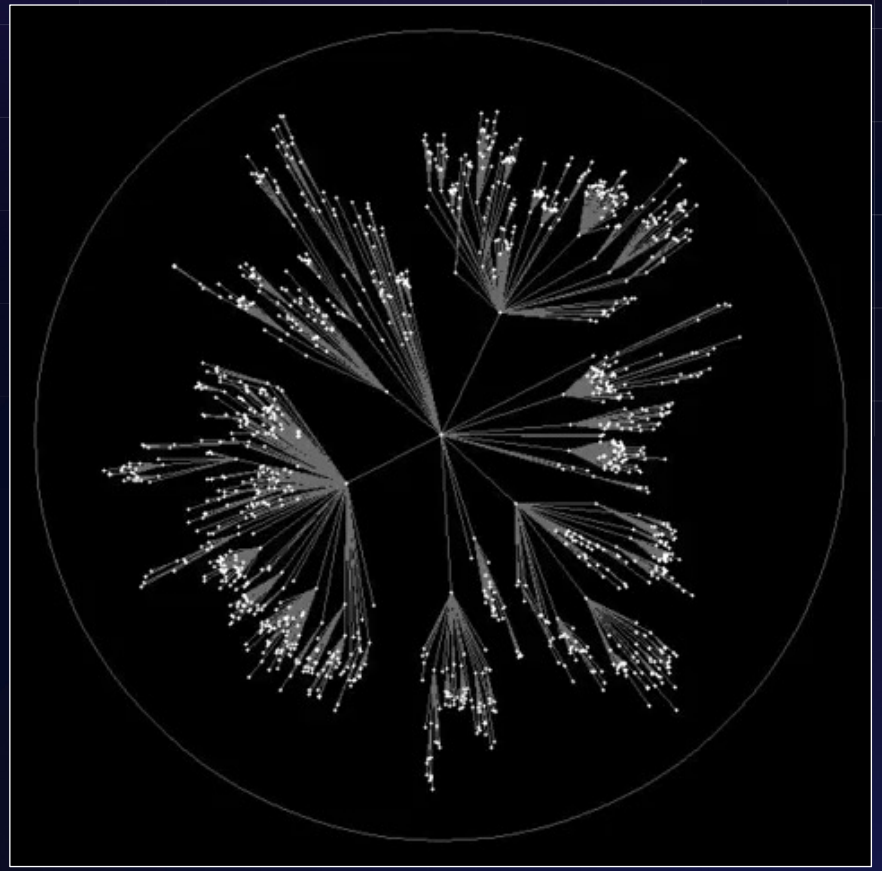




Professor Dirk Brockmann's modeling system study for pandemic 2013 : Wan Epi Paphos

Cartographic representations

Strong science fiction references



Professor Dirk Brockmann’s modeling system study for pandemic 2013 : Wan Epi Paphos

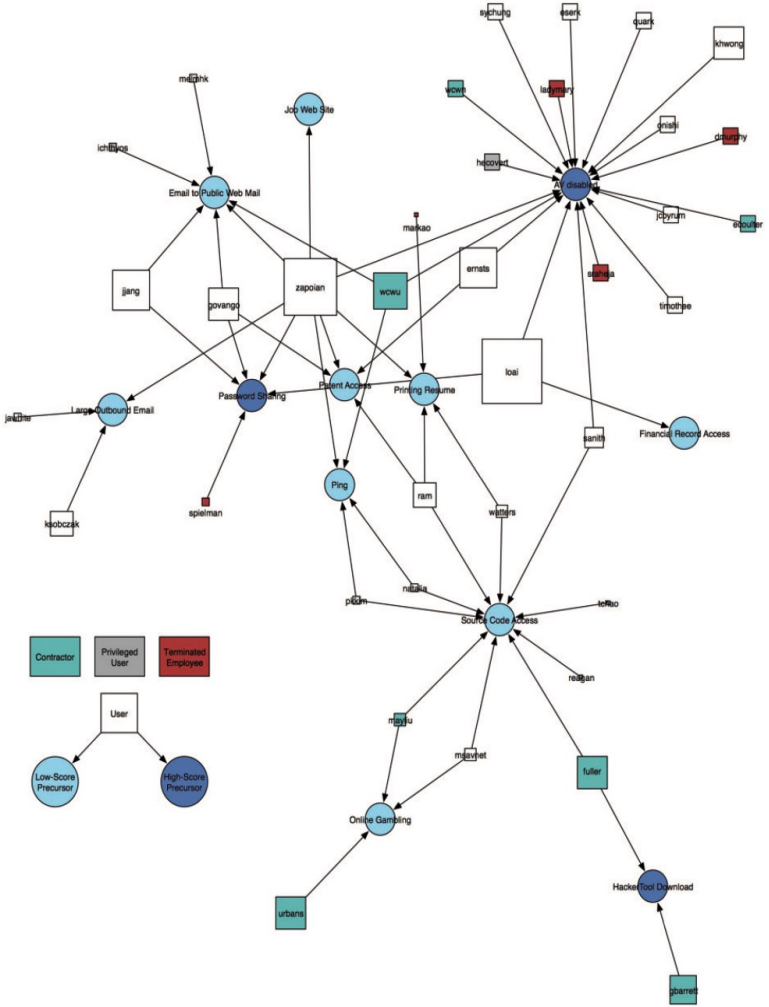
Cartographic representations

Critical visualization: a case for rethinking how we visualize risk and security

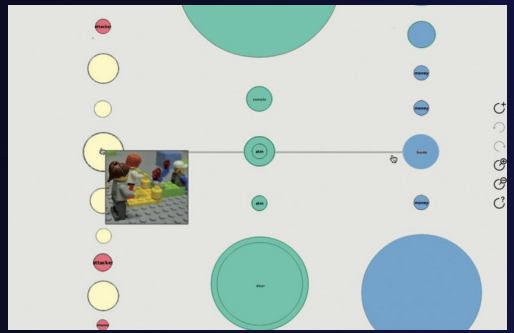
Peter Hall[1,*] Claude Heath[2] and Lizzie Coles-Kemp[2]

> "The predominant mode of visualization in the security field comes from a statistical and probabilistic approach that perpetuates a particular way of looking at the problem and is based on a relatively thin narrative of cybersecurity."

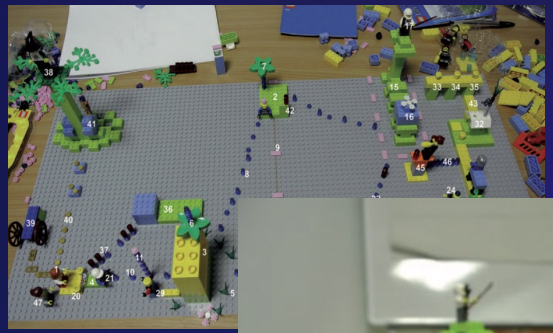
For example, Raffael Marty's "Applied Security Visualisation" uses "progressive disclosure" for the iterative elimination of "outliers", based on the analysis of network nodes that generate traffic with large packets and determining whether they reveal suspicious distribution patterns. In this way, Marty arrives at a suspect botnet controller. The visualization, according to Marty, is worth a thousand log records.



Cartographic representations





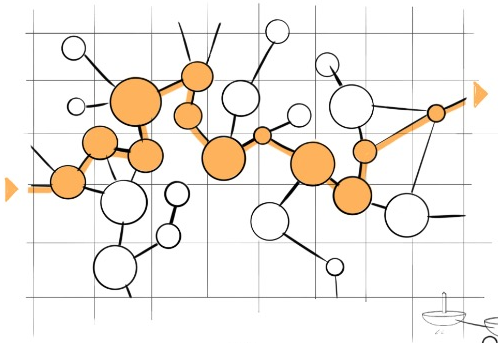


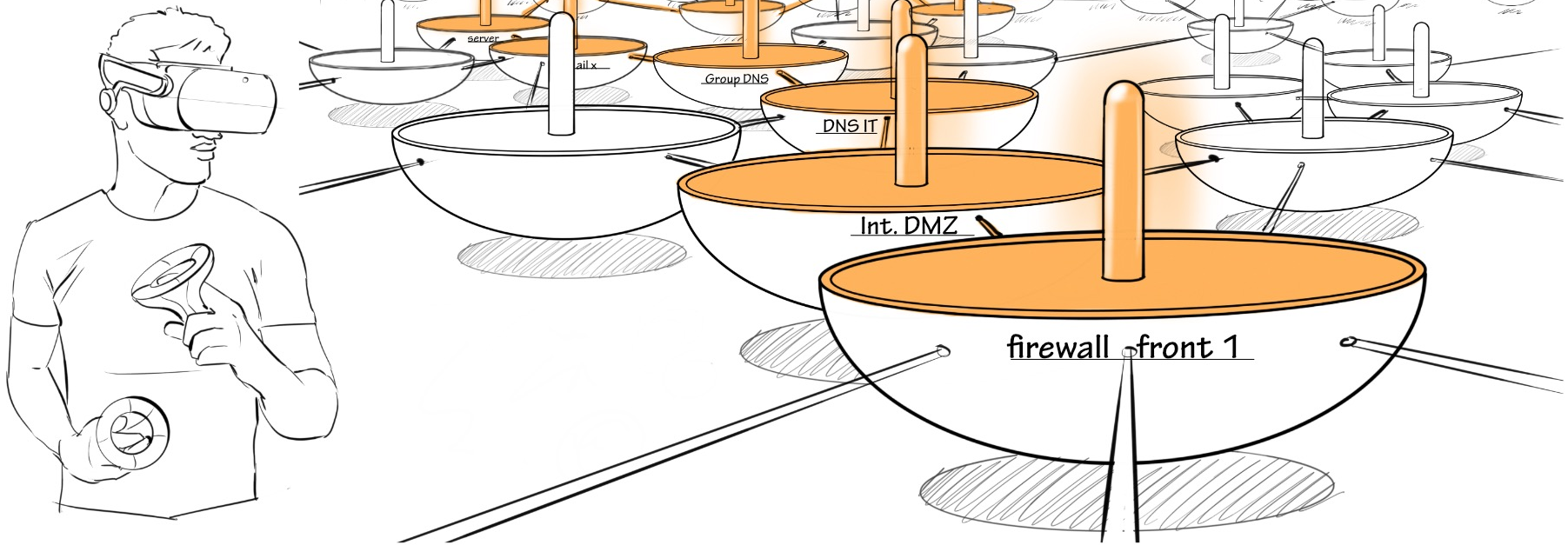


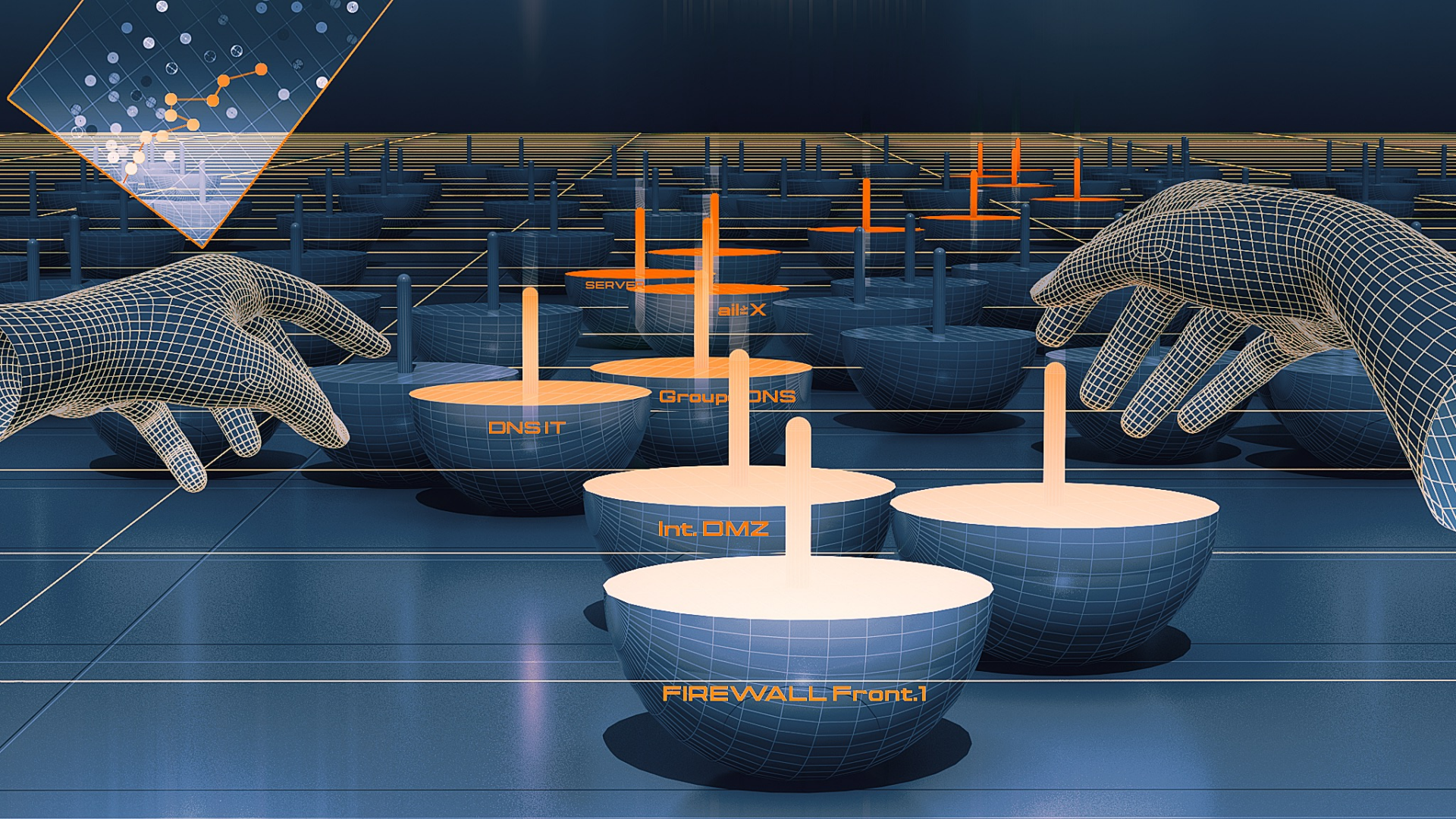
Cartographic representations

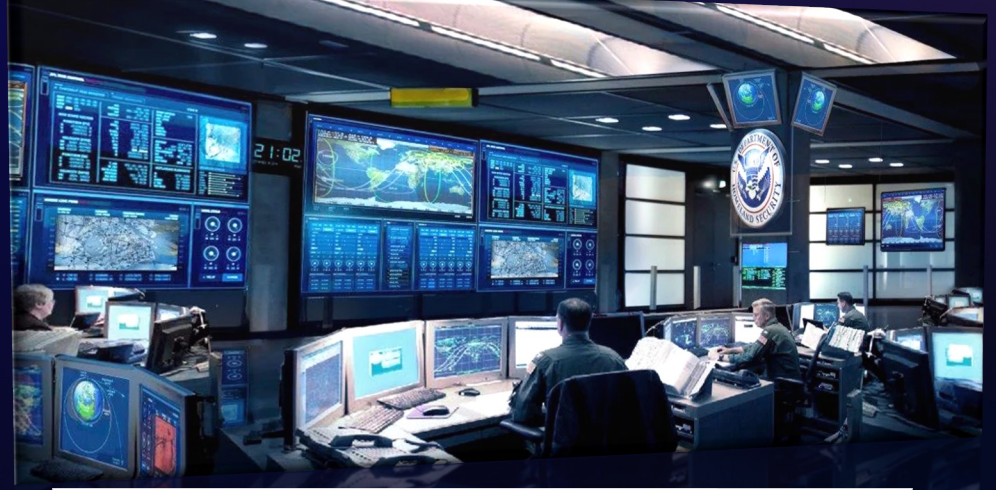
Strong science fiction references






server
ail x
Group DNS
DNS IT
Int. DMZ
firewall_front 1

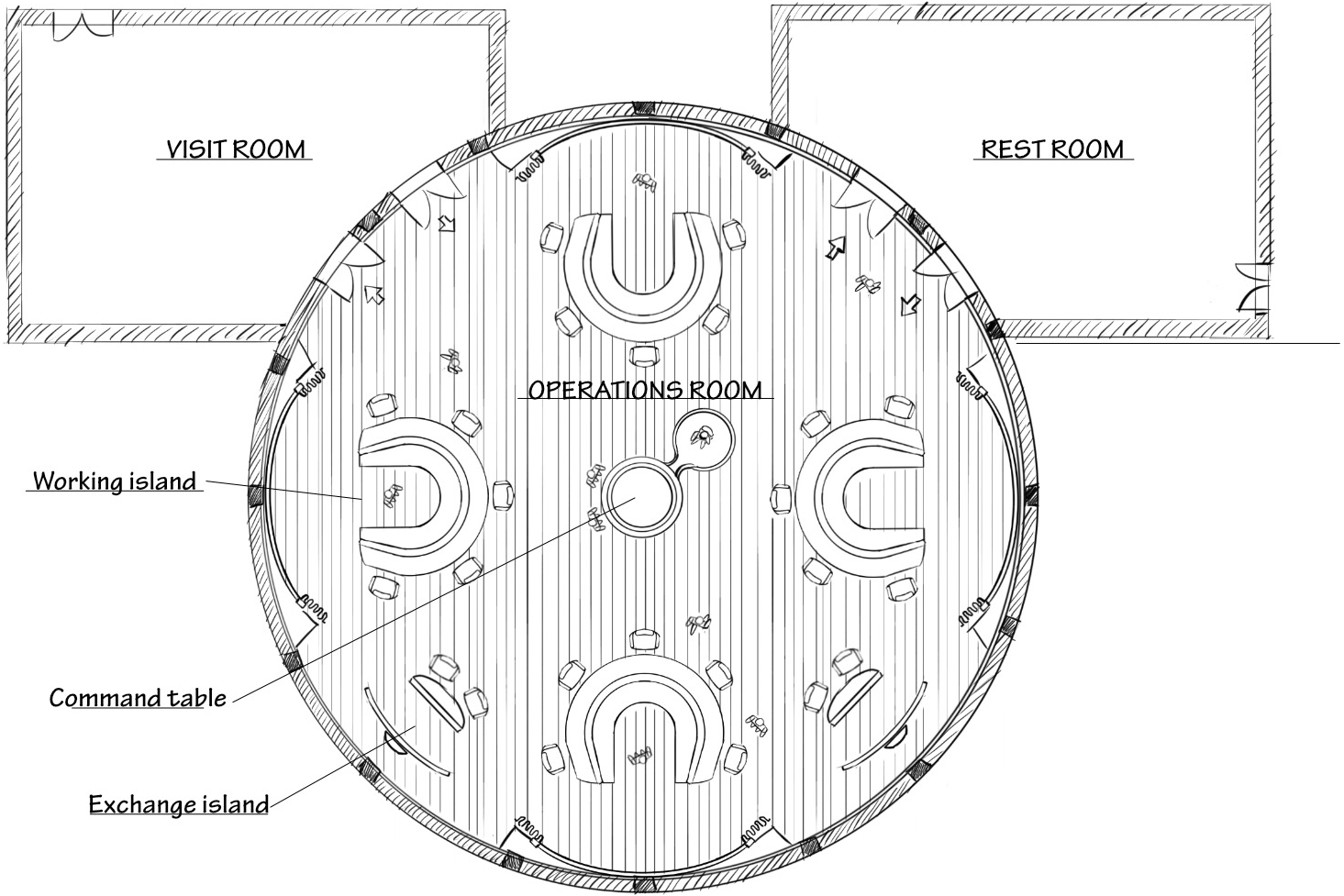

SERVER
ail-X
DNS IT
Int. DMZ
FIREWALL Front.1

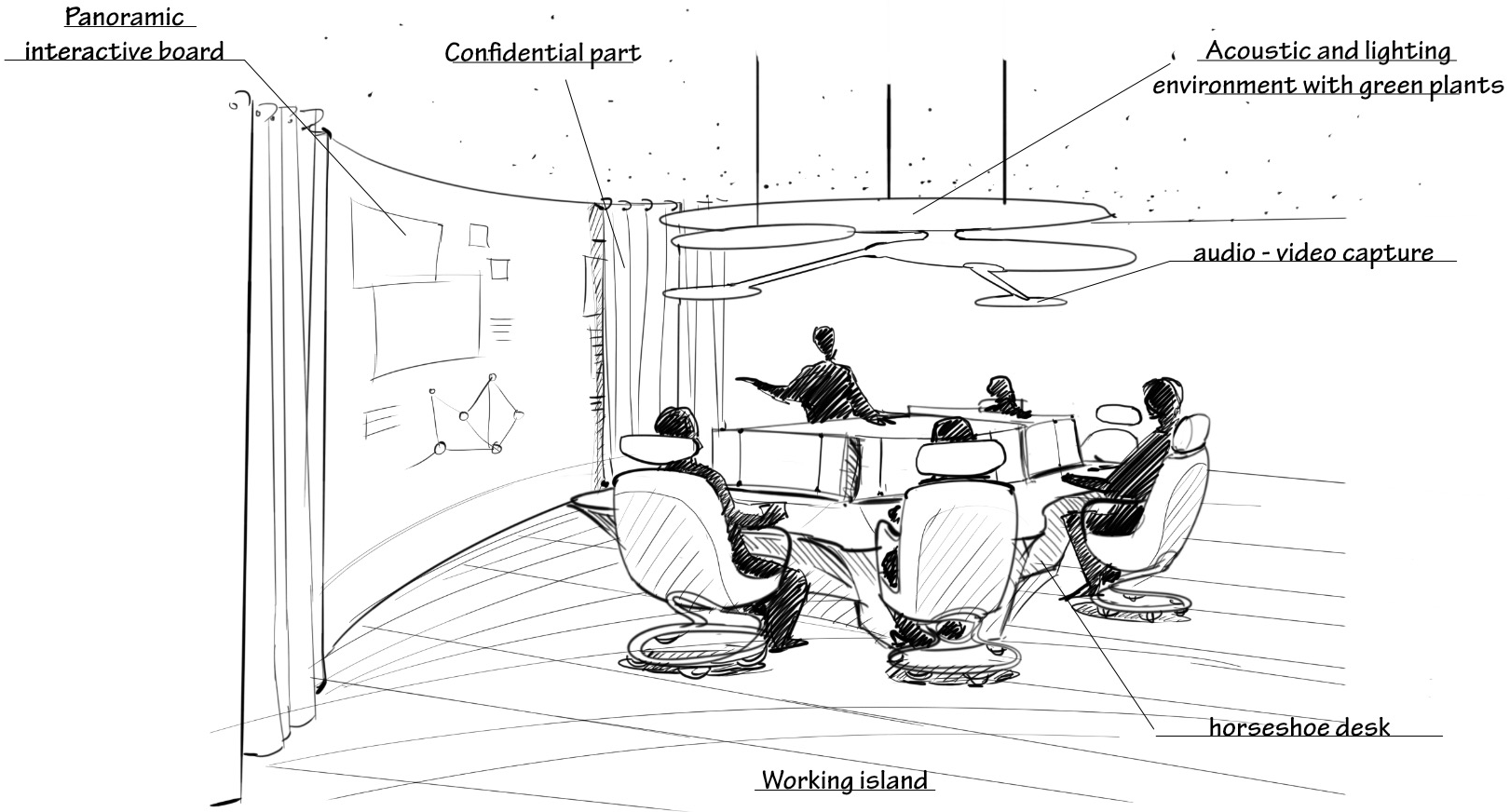


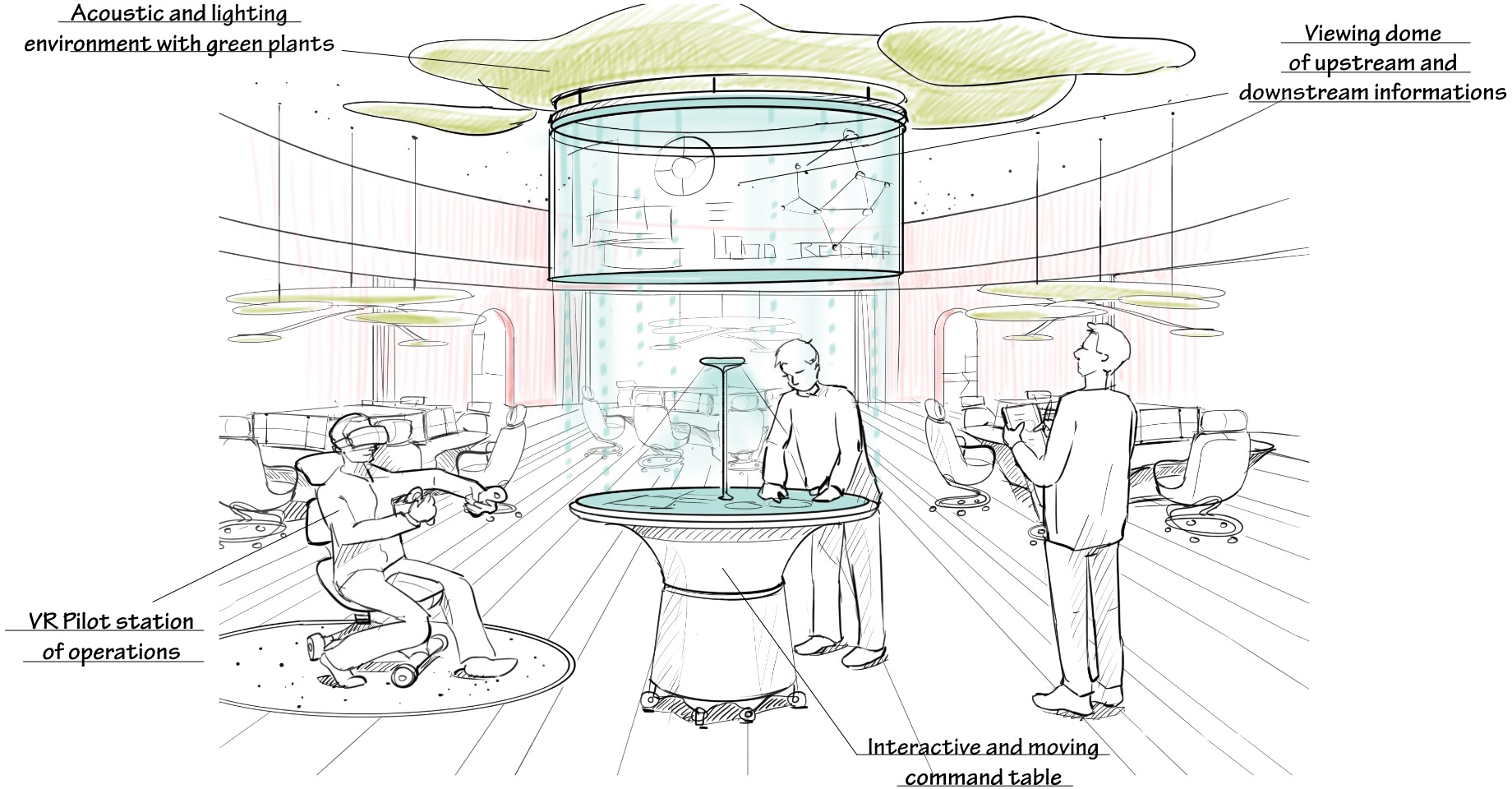




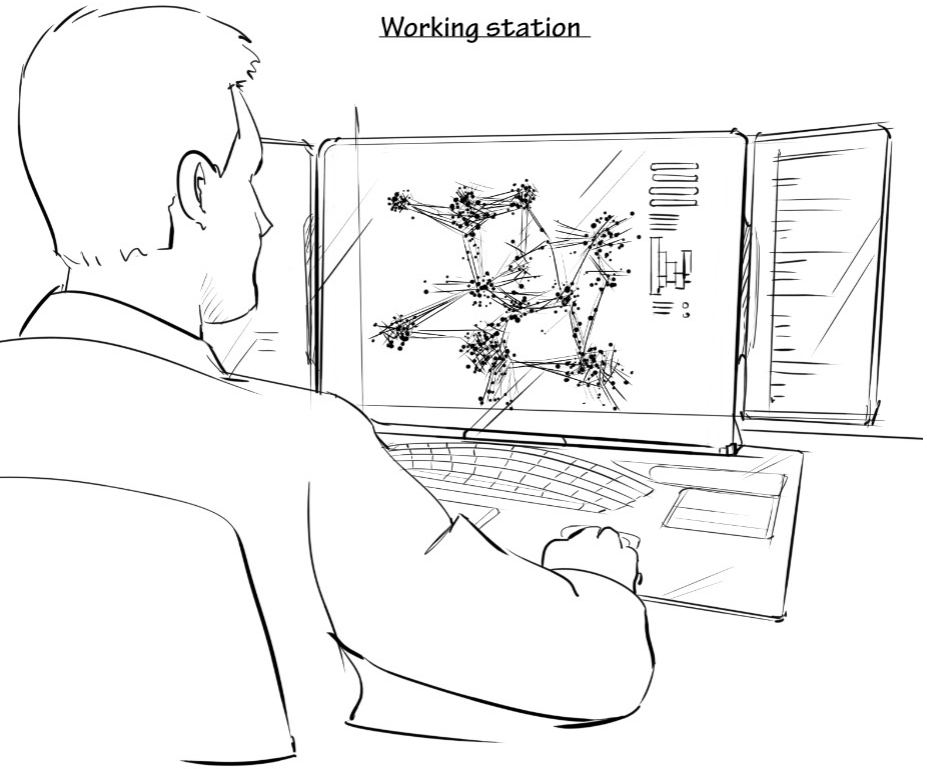



VISIT ROOM
REST ROOM
OPERATIONS ROOM
Working island
Command table
Exchange island

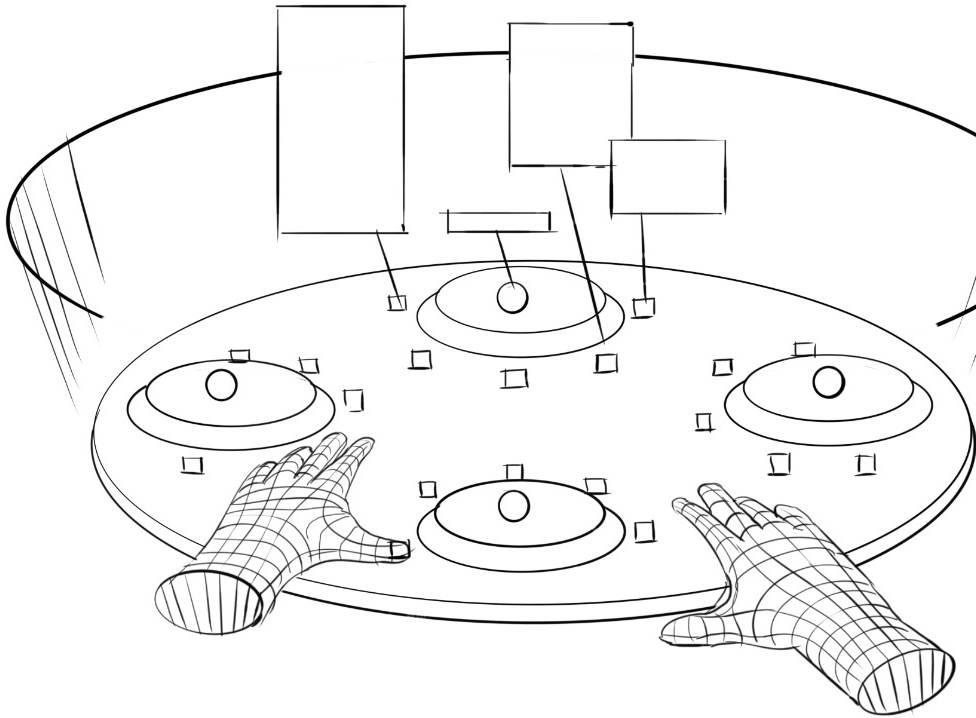

Panoramic interactive board
Confidential part
Acoustic and lighting environment with green plants
audio - video capture
horseshoe desk
Working island


Acoustic and lighting environment with green plants
Viewing dome of upstream and downstream informations
VR Pilot station of operations
Interactive and moving command table

Working station



VR Pilot station
of operations







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