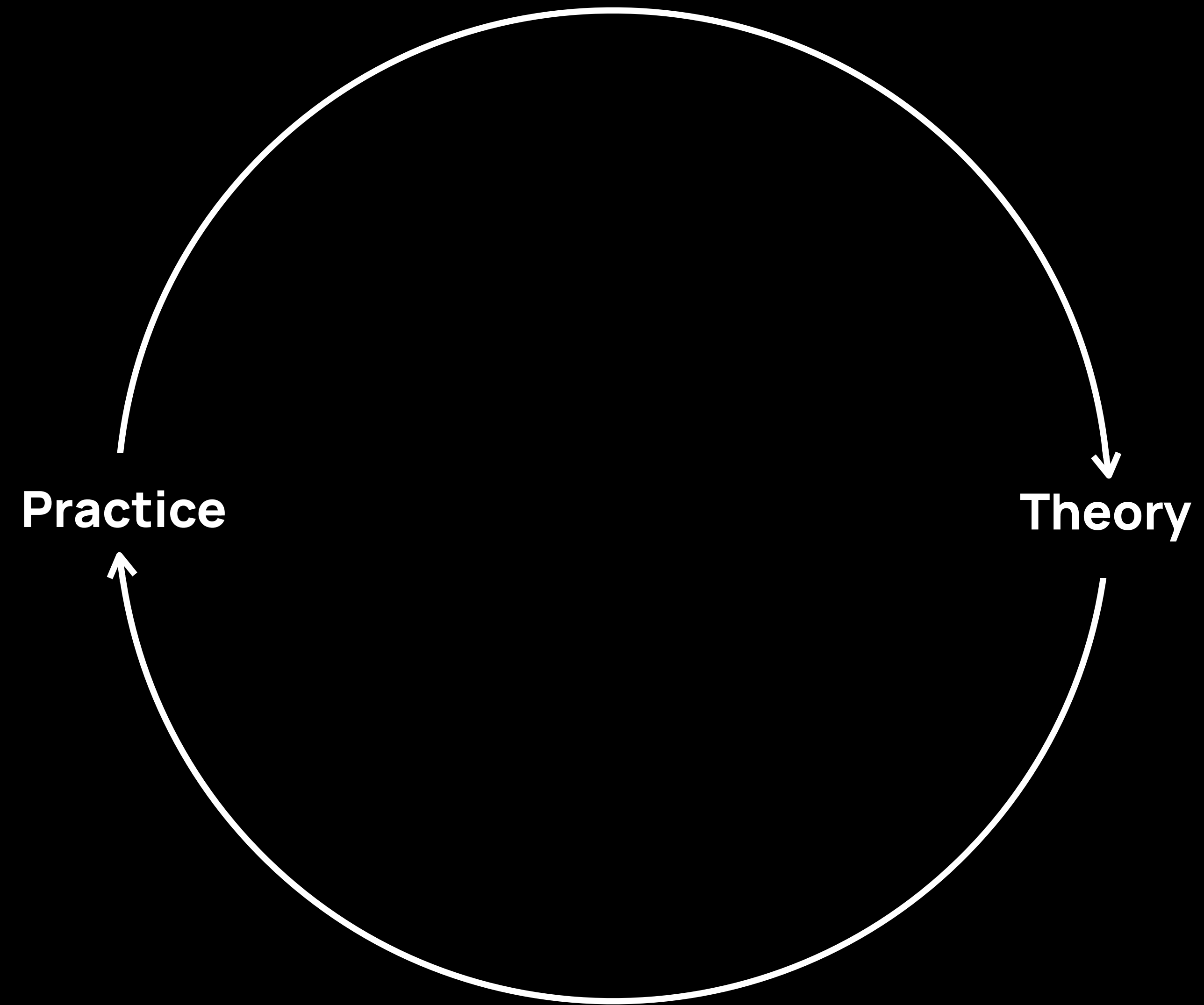


DATA VISUALIZATION AS ABSTRACT REALISM

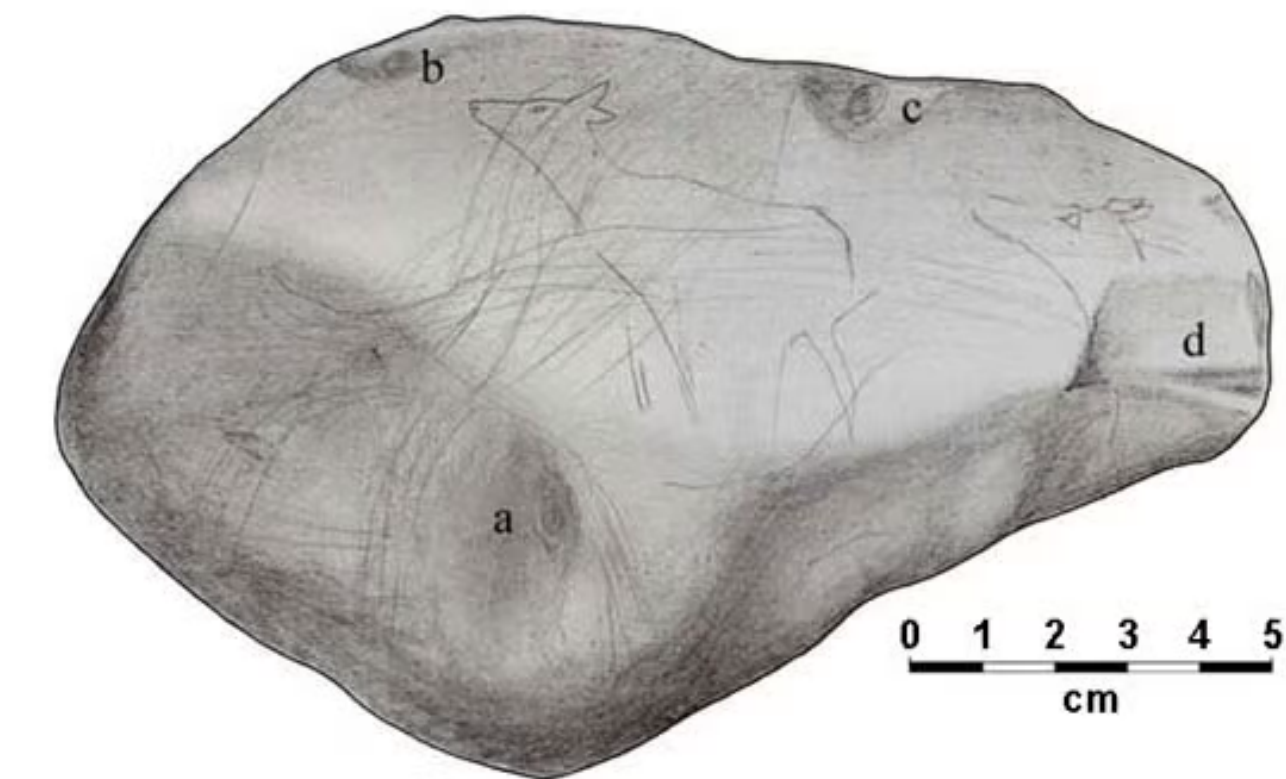
Abstraction Today: The Real and the Imaginary

Prof. Dr. Kim Albrecht,
Folkwang University of the Arts
December 16th 2025





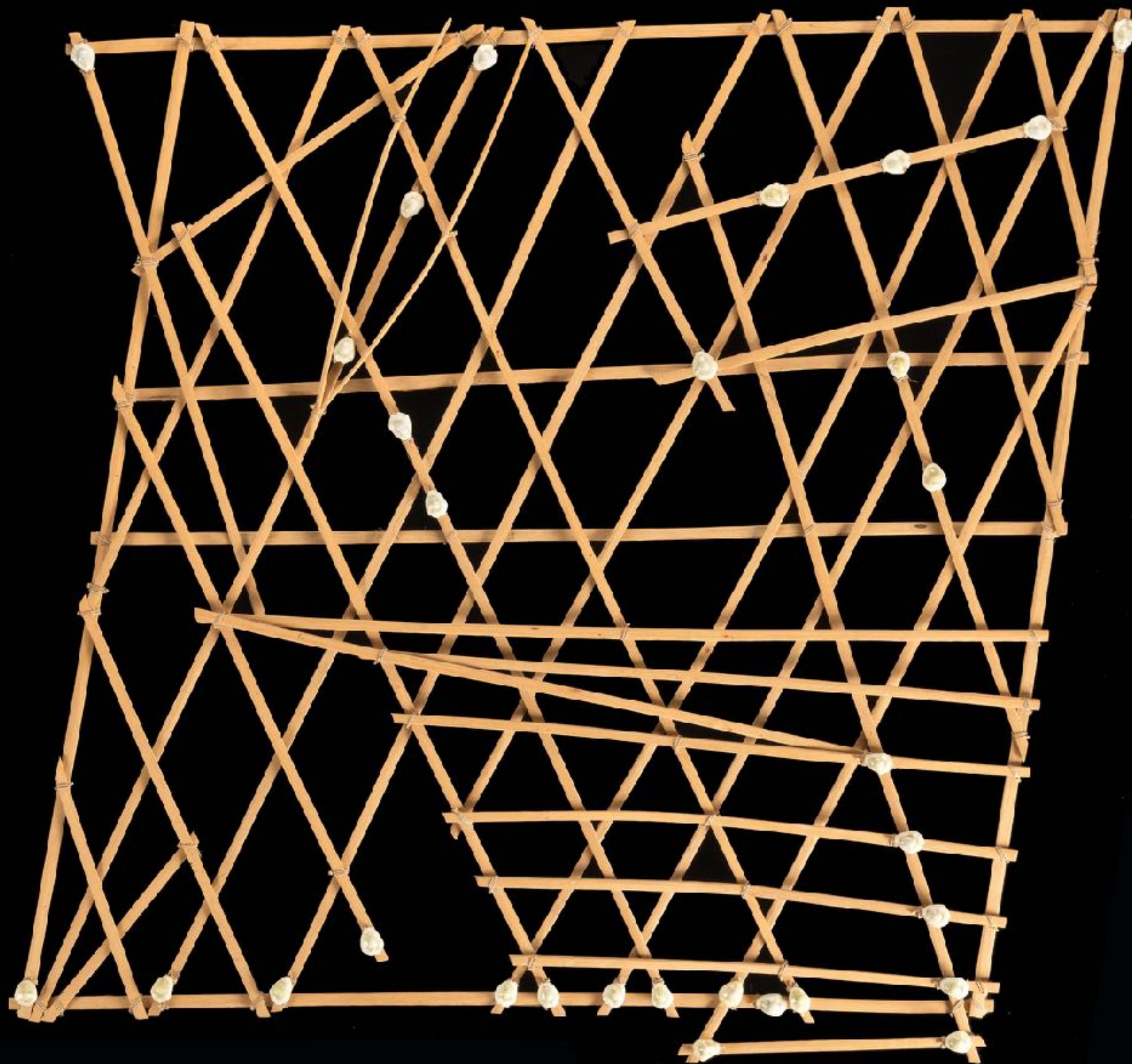




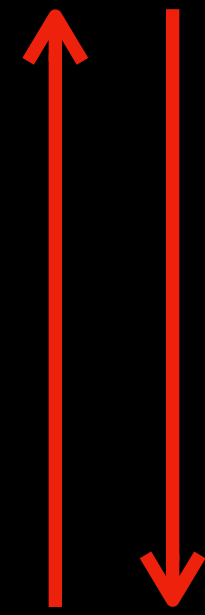
P. Utrilla, C. Mazo, M.C. Sopena, M. Martínez-Bea, R. Domingo, A palaeolithic map from 13,660 calBP: engraved stone blocks from the Late Magdalenian in Abauntz Cave (Navarra, Spain), *Journal of Human Evolution*, Volume 57, Issue 2, 2009, Pages 99-111, ISSN 0047-2484, <https://doi.org/10.1016/j.jhevol.2009.05.005>.

Image: <https://www.spektrum.de/news/landkarte-aus-der-steinzeit/1002726>





Abstraction



Reality

INFORMATION DESIGN

A DEFINITION

Semiotics

Sign

Representation of
something else

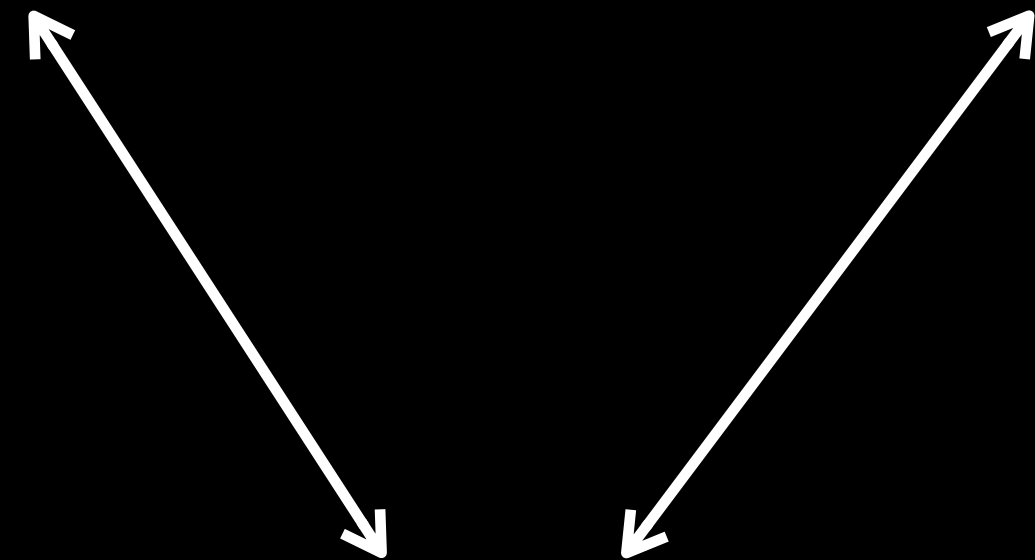
Signified → **Signifier**

Concept / Object

Form of a Sign

Interpretant

Audience / Observer



Semiotics

Sign

Representation of something else

Signified

Concept / Object

Interpretant

Audience / Observer



Icon

Resemblance

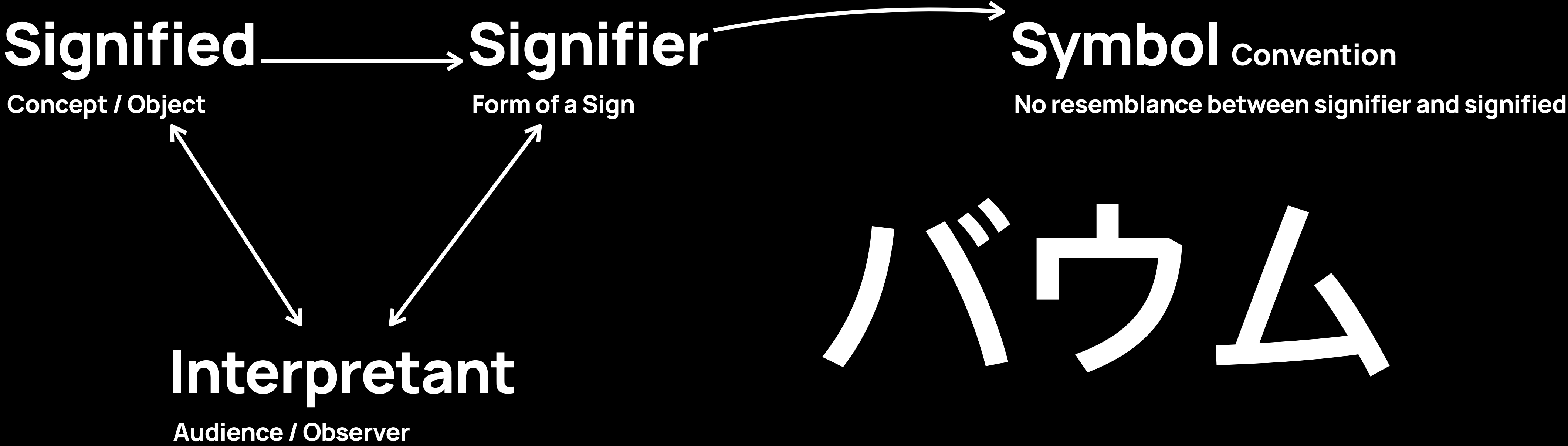
Physical resemblance to the signified



Sign

Representation of something else

BAUM



バウム

Semiotics

Sign

Representation of something else

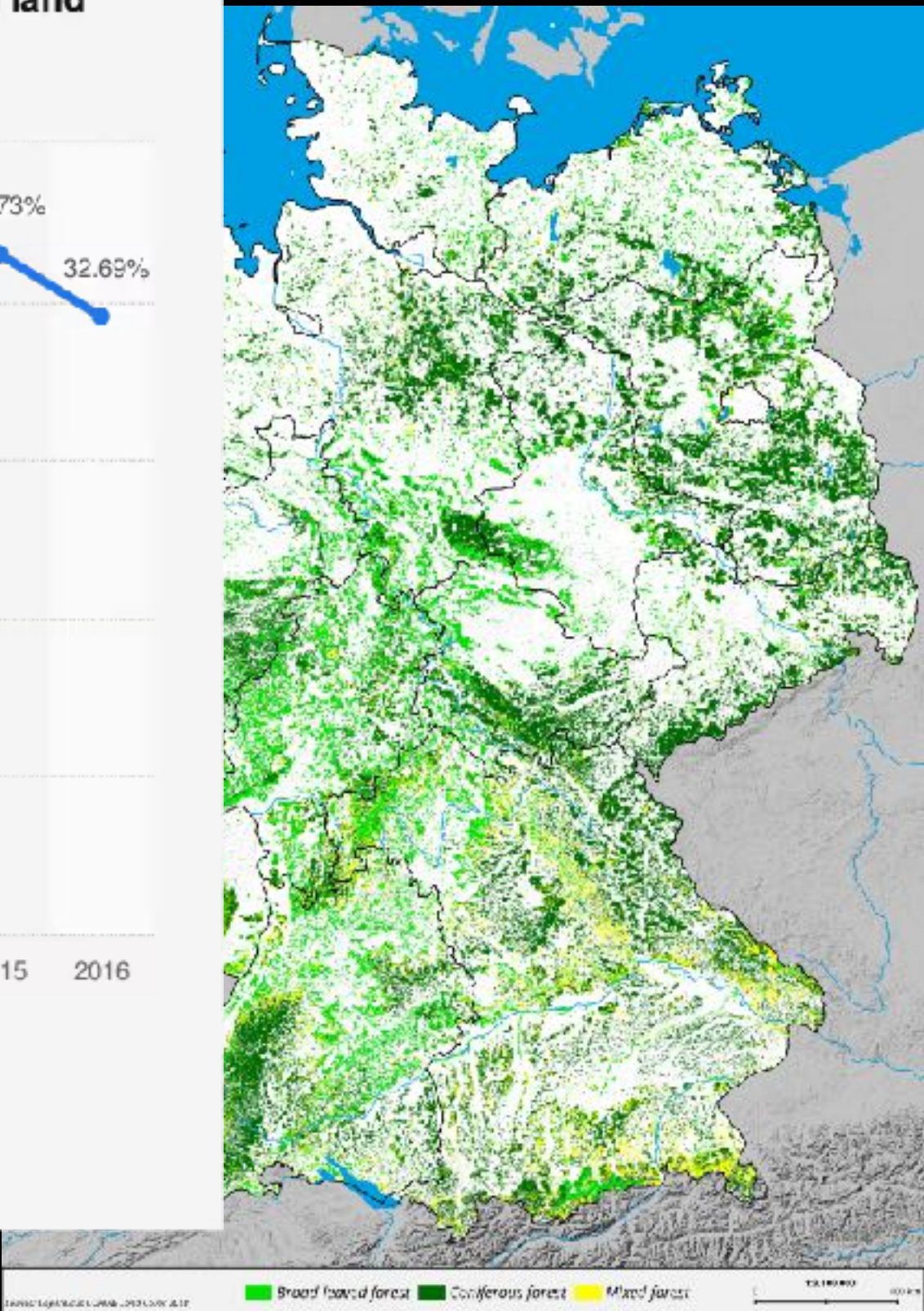
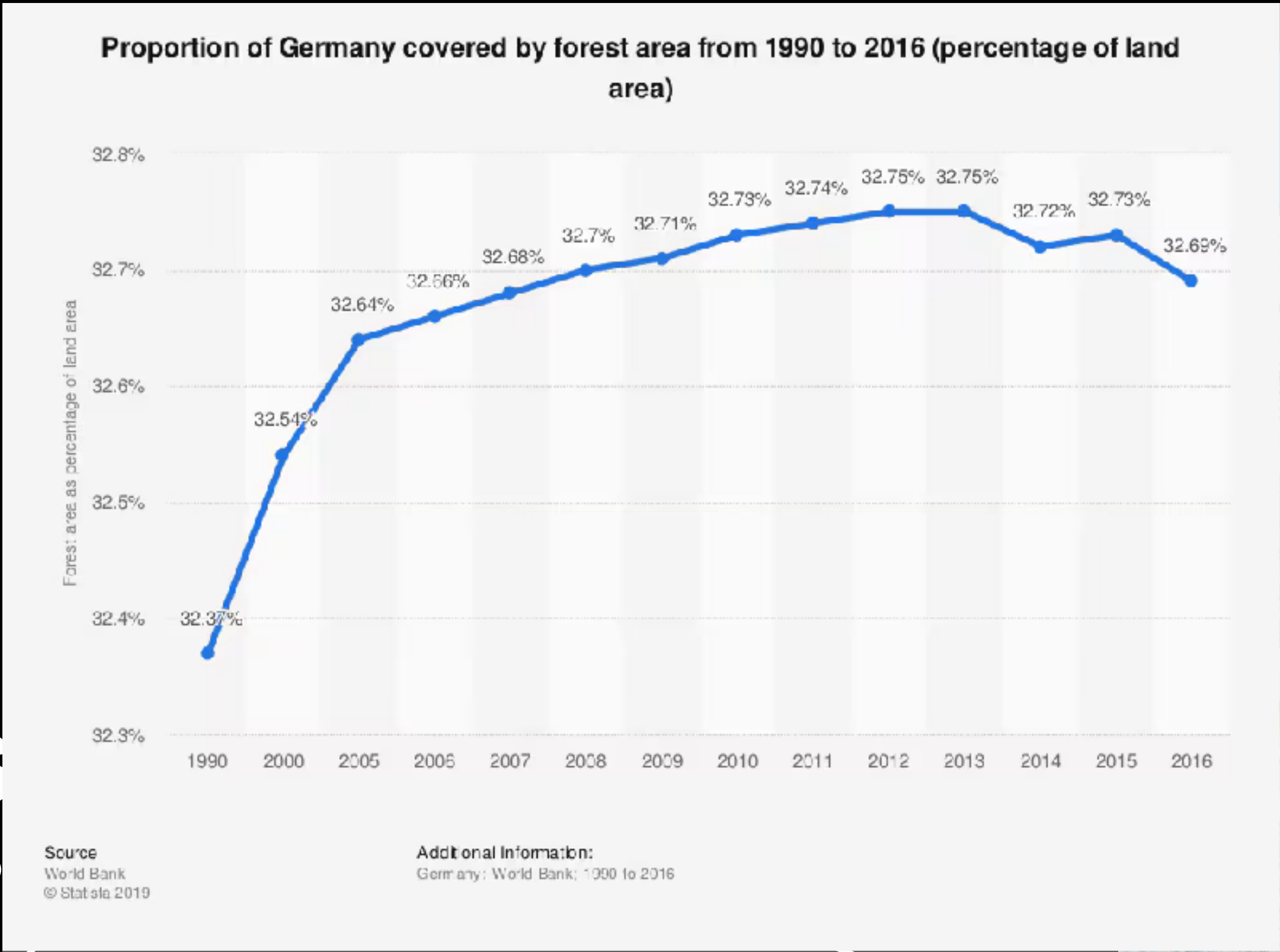
Signified

Concept / Object

Forest

Interpretant

Audience / Observer



Index Evidence
Shows evidence of the signified

Semiotics

Sign

Representation of something else

Signified

Concept / Object

Signifier

Form of a Sign

Icon

Resemblance

Physical resemblance to the signified

Symbol

Convention

No resemblance between signifier and signified

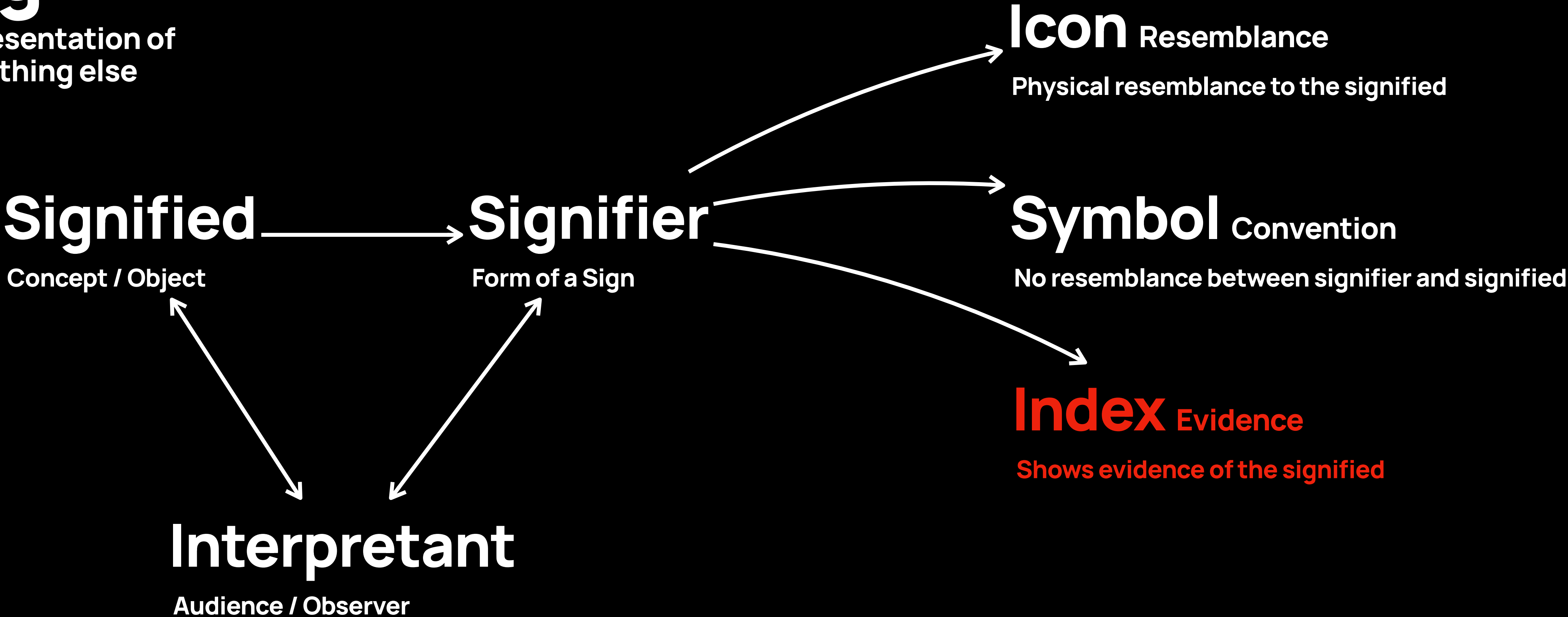
Index

Evidence

Shows evidence of the signified

Interpretant

Audience / Observer



Semiotics



Icon Resemblance

Physical resemblance to the signified

Symbol Convention

No resemblance between signifier and signified



Index Evidence

Shows evidence of the signified

Semiotics

Sign

Representation of something else

Signified

Concept / Object

Signifier

Form of a Sign

Icon

Resemblance

Physical resemblance to the signified

Symbol

Convention

No resemblance between signifier and signified

Index

Evidence

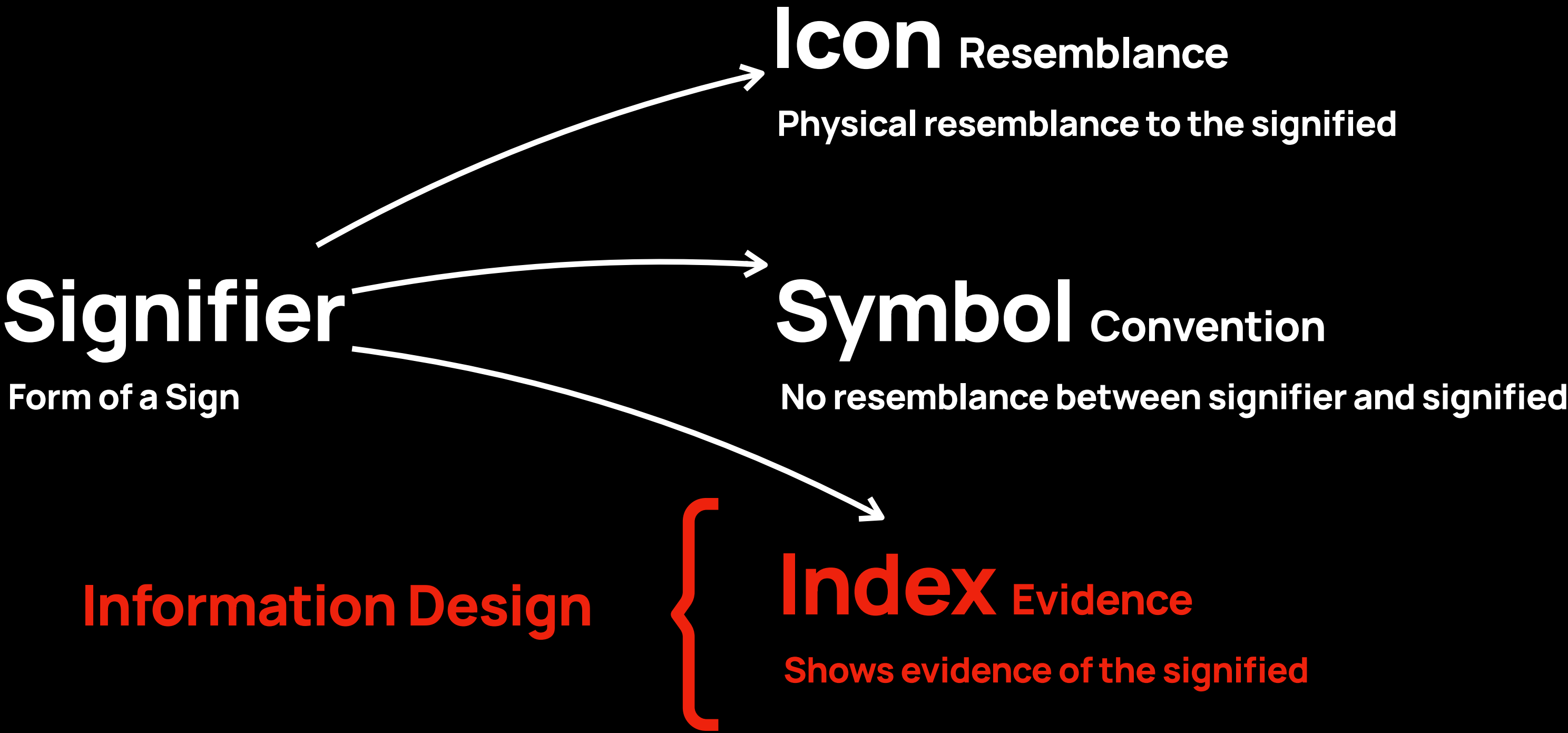
Shows evidence of the signified

Interpretant

Audience / Observer

With an index, the signifier can not exist without the presence of the signified.

Bei einem Index kann der Signifikant nicht ohne das Vorhandensein des Signifikats existieren.



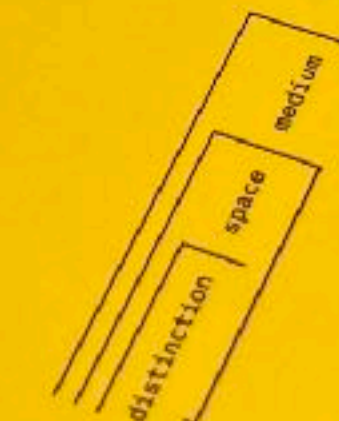
Information Design

Communication Design

Insight by de-sign

Kim Albrecht

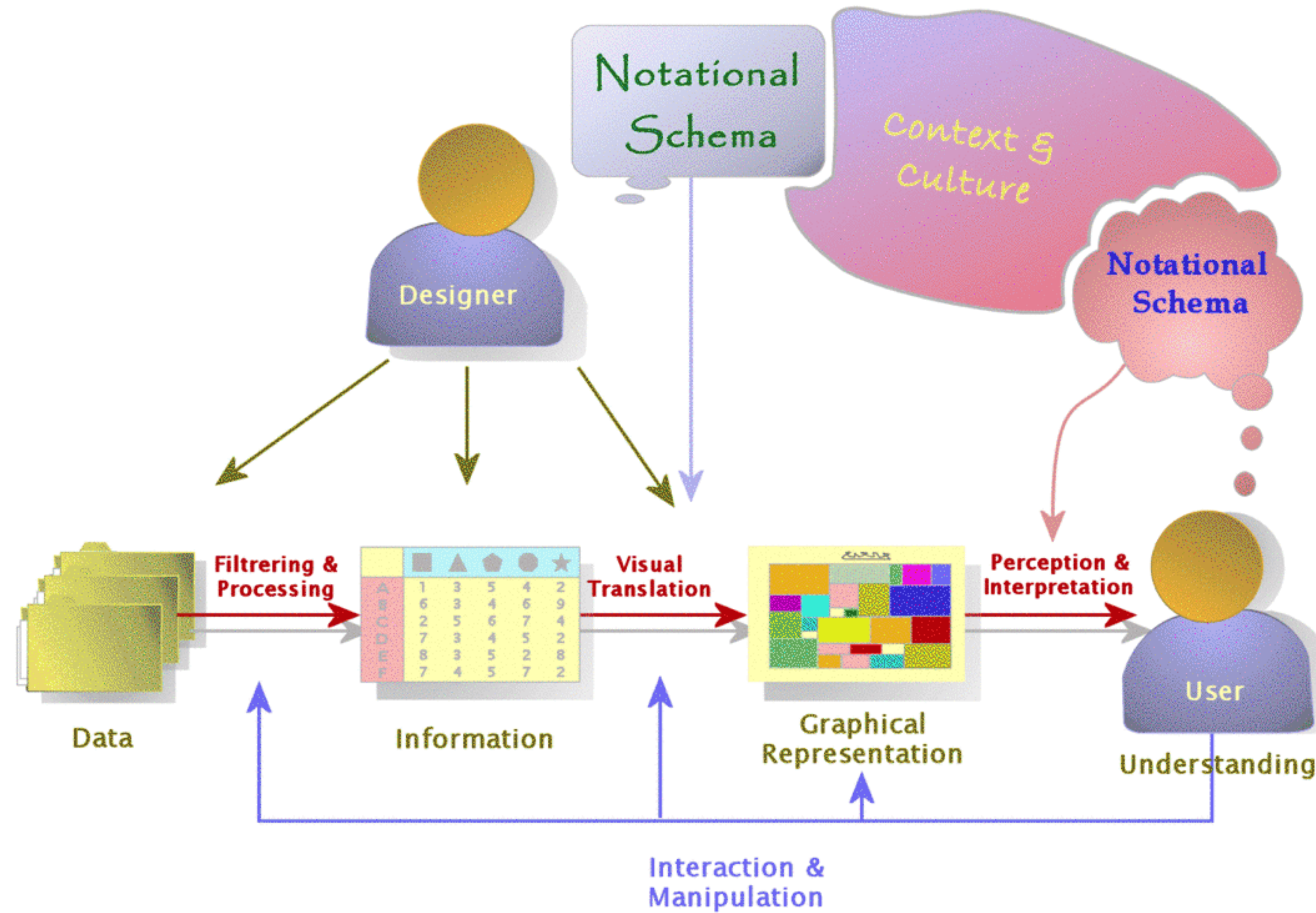
05

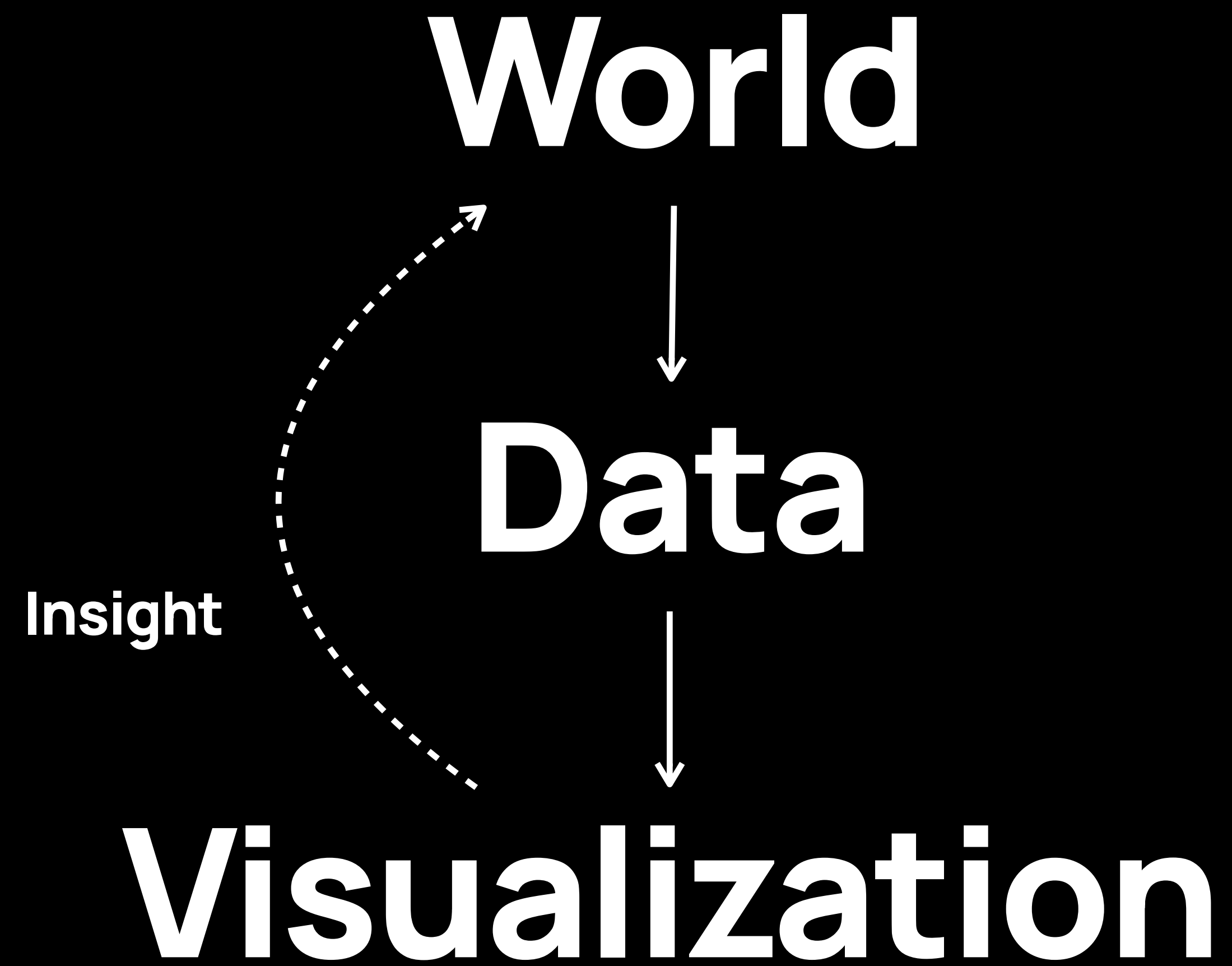


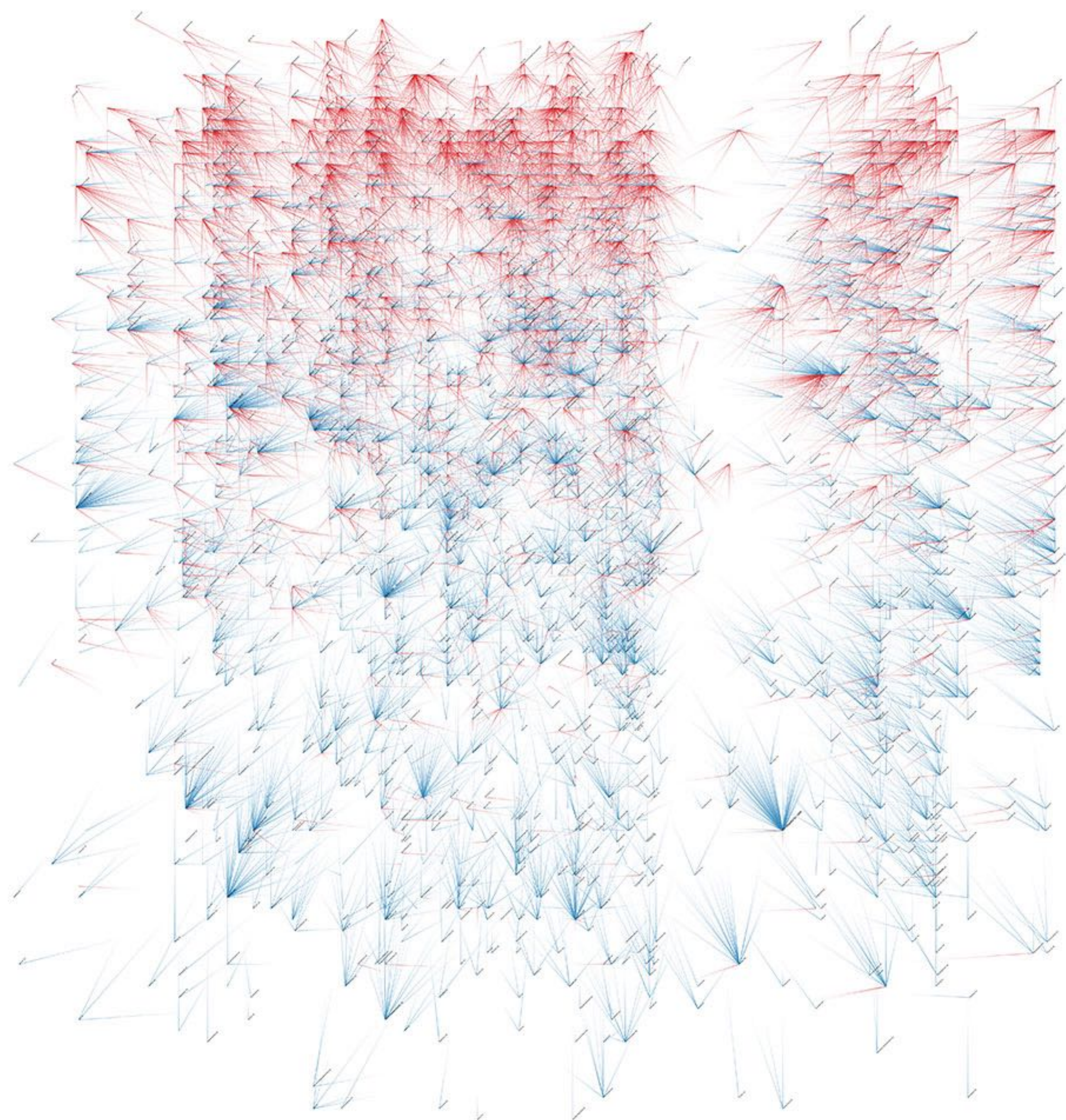
design

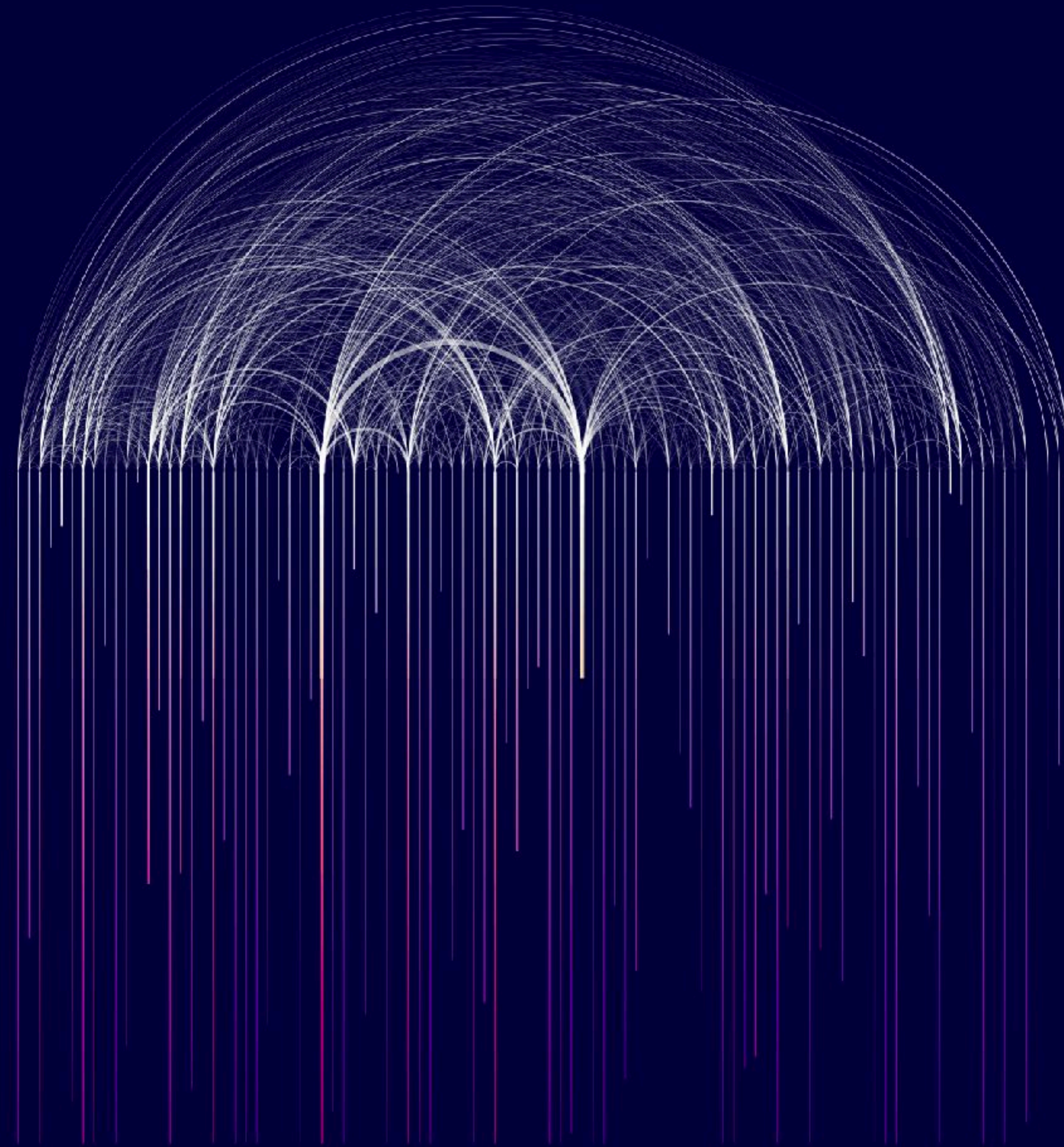
καδμος

Conceptions of Data Visualization





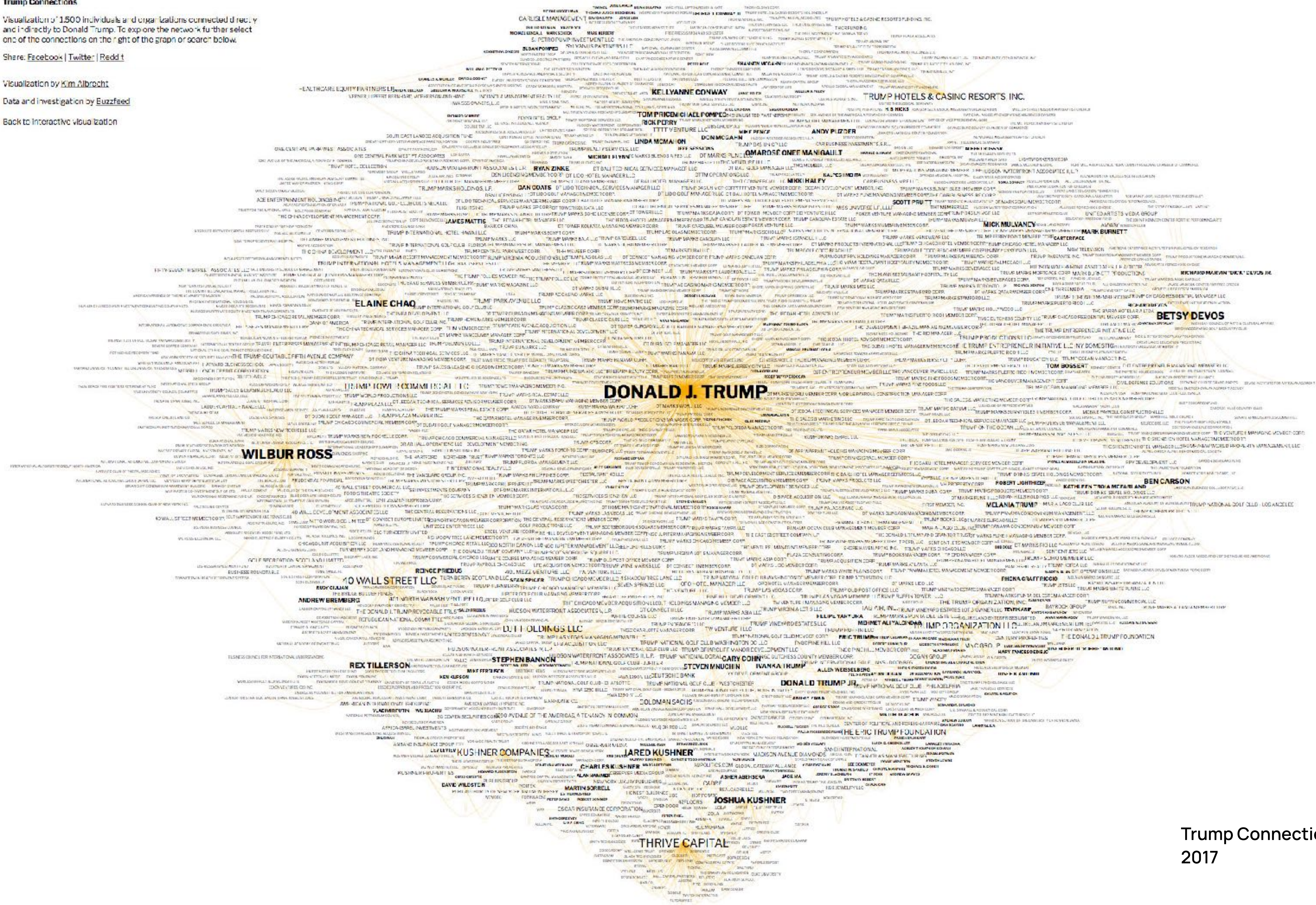




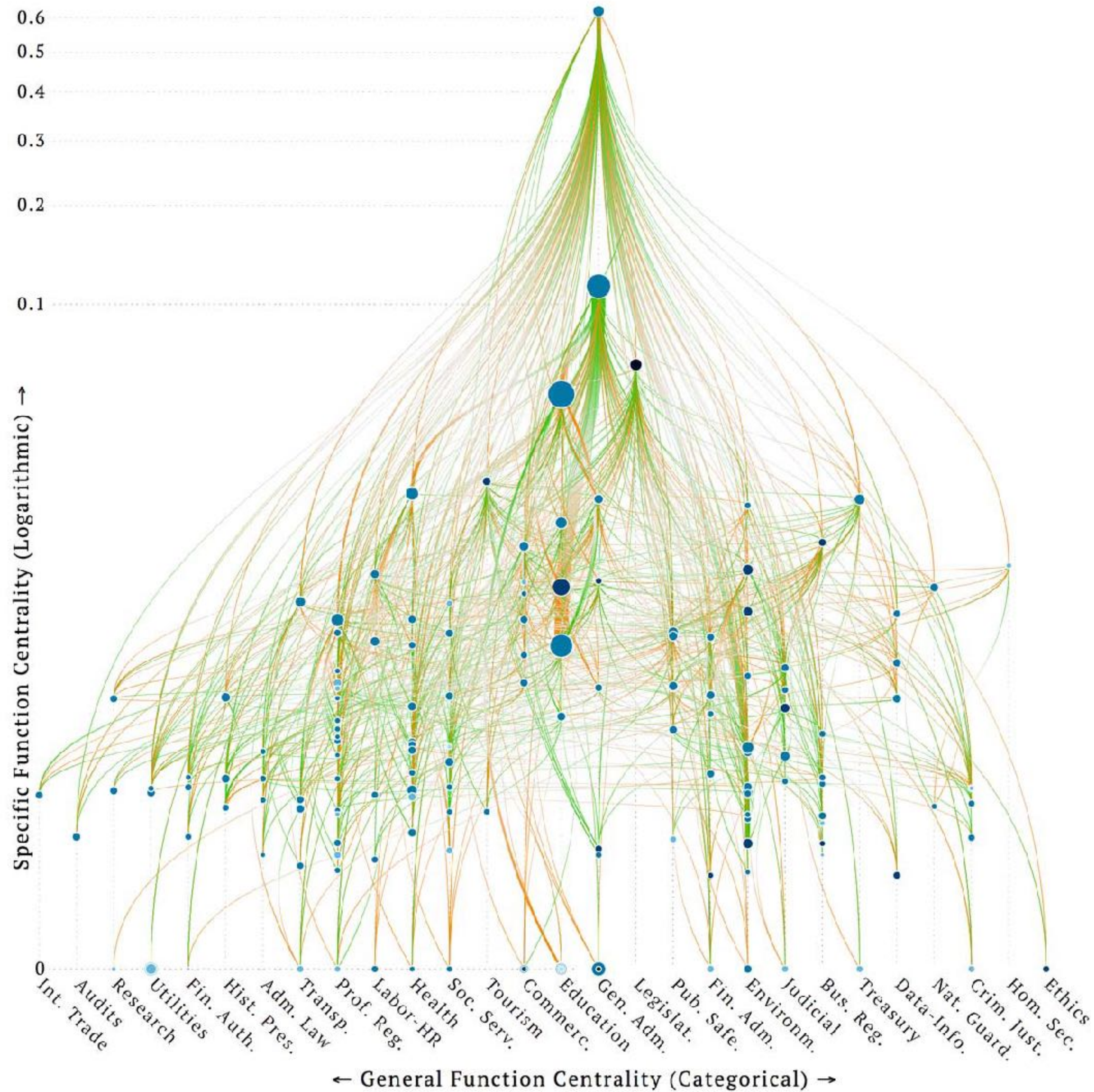
Visualization of 1,500 individuals and organizations connected directly and indirectly to Donald Trump. To explore the network further select one of the connections on the right of the graph or search below.

Visualization by [Kim Albrecht](#)

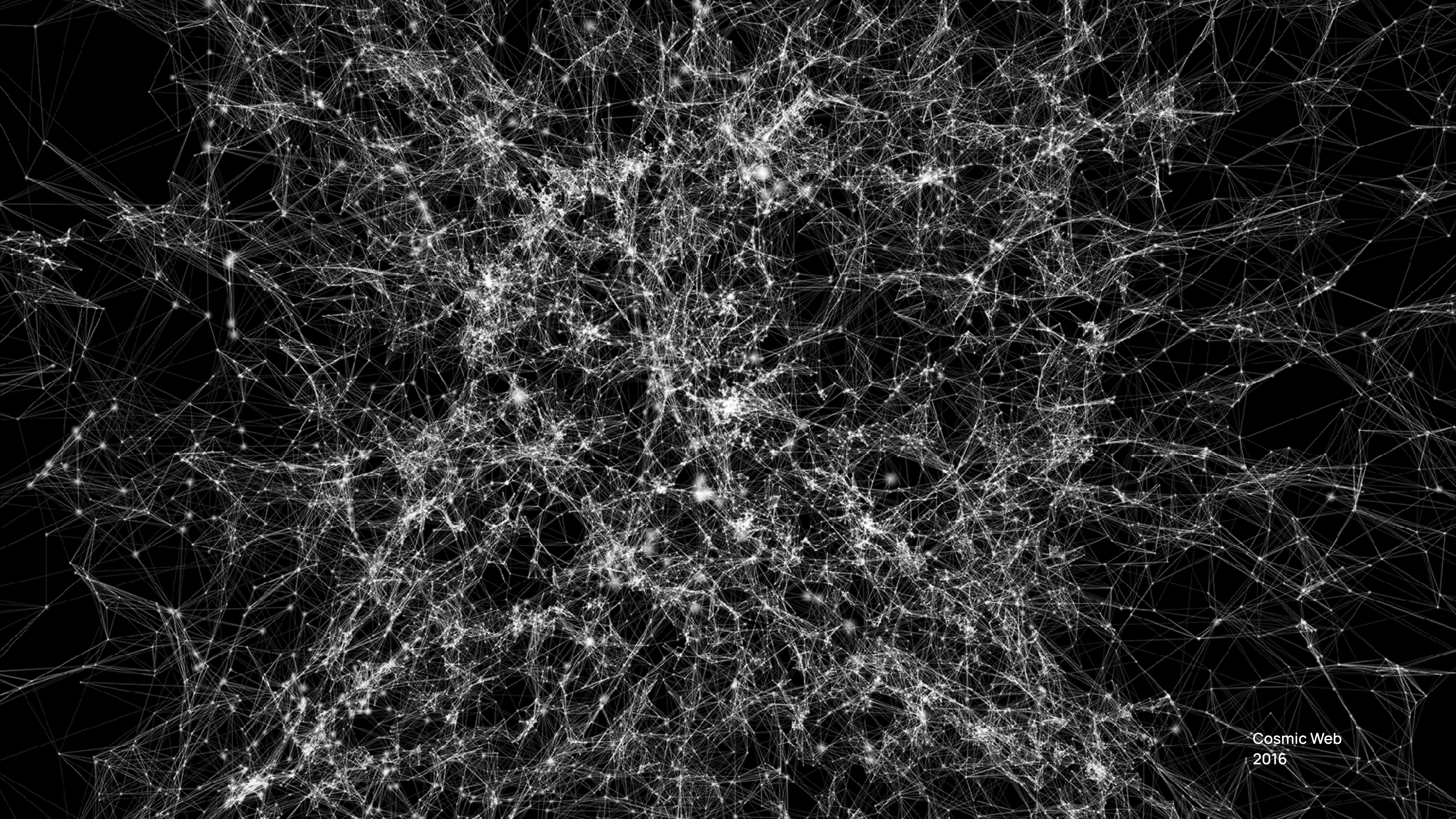
[Back to Interactive visualization](#)



Trump Connections 2017

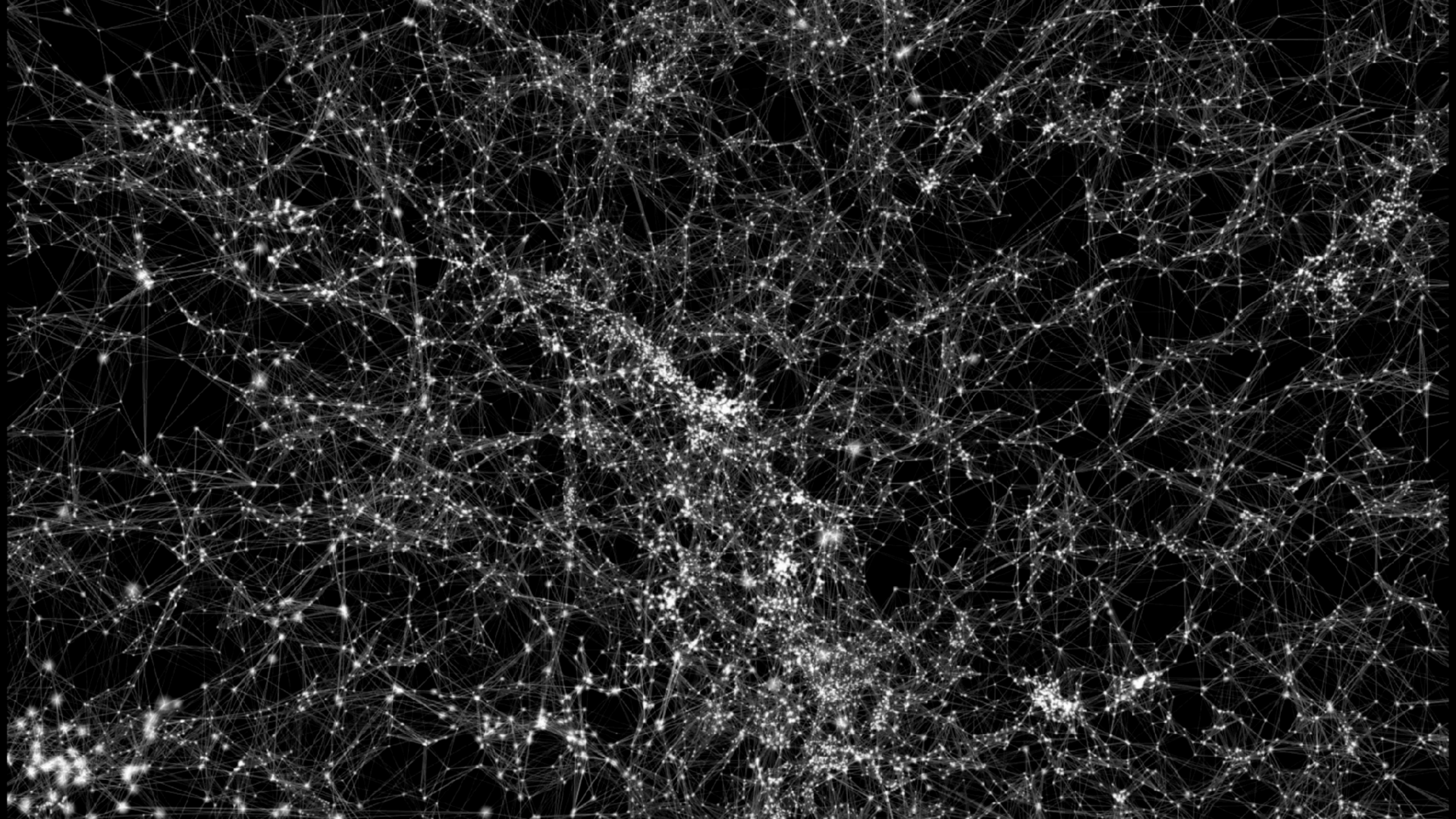


Government Networks
2018



Cosmic Web
2016

**“... data nor visualizations
are ever neutral.”**



**» Perhaps the
Universe can be
thought of as God's
Brain.«**

Comment by mkogady

[https://www.wired.com/2016/04/explore-cosmos-bonkers-
interactive-model/#article-comments](https://www.wired.com/2016/04/explore-cosmos-bonkers-interactive-model/#article-comments)

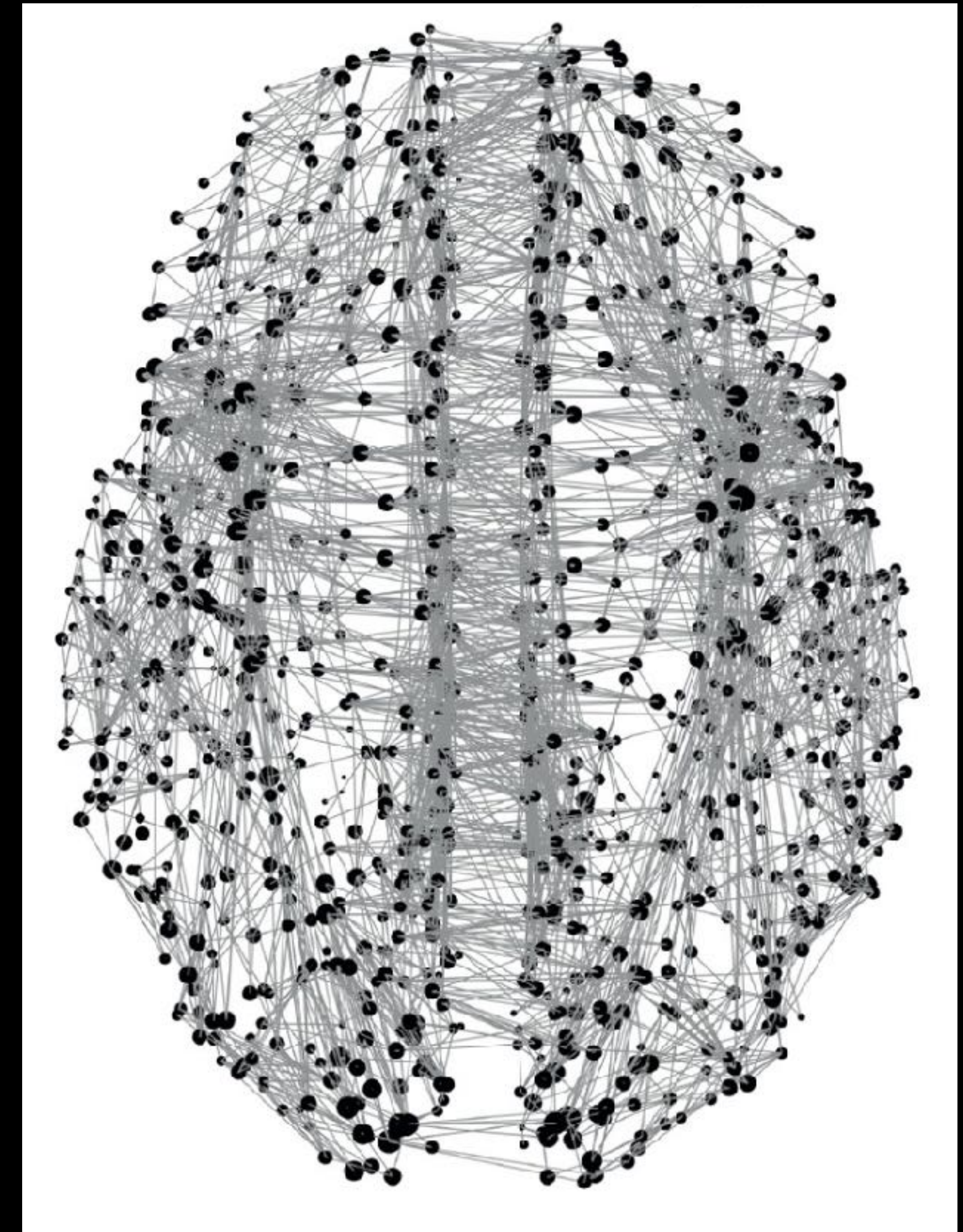
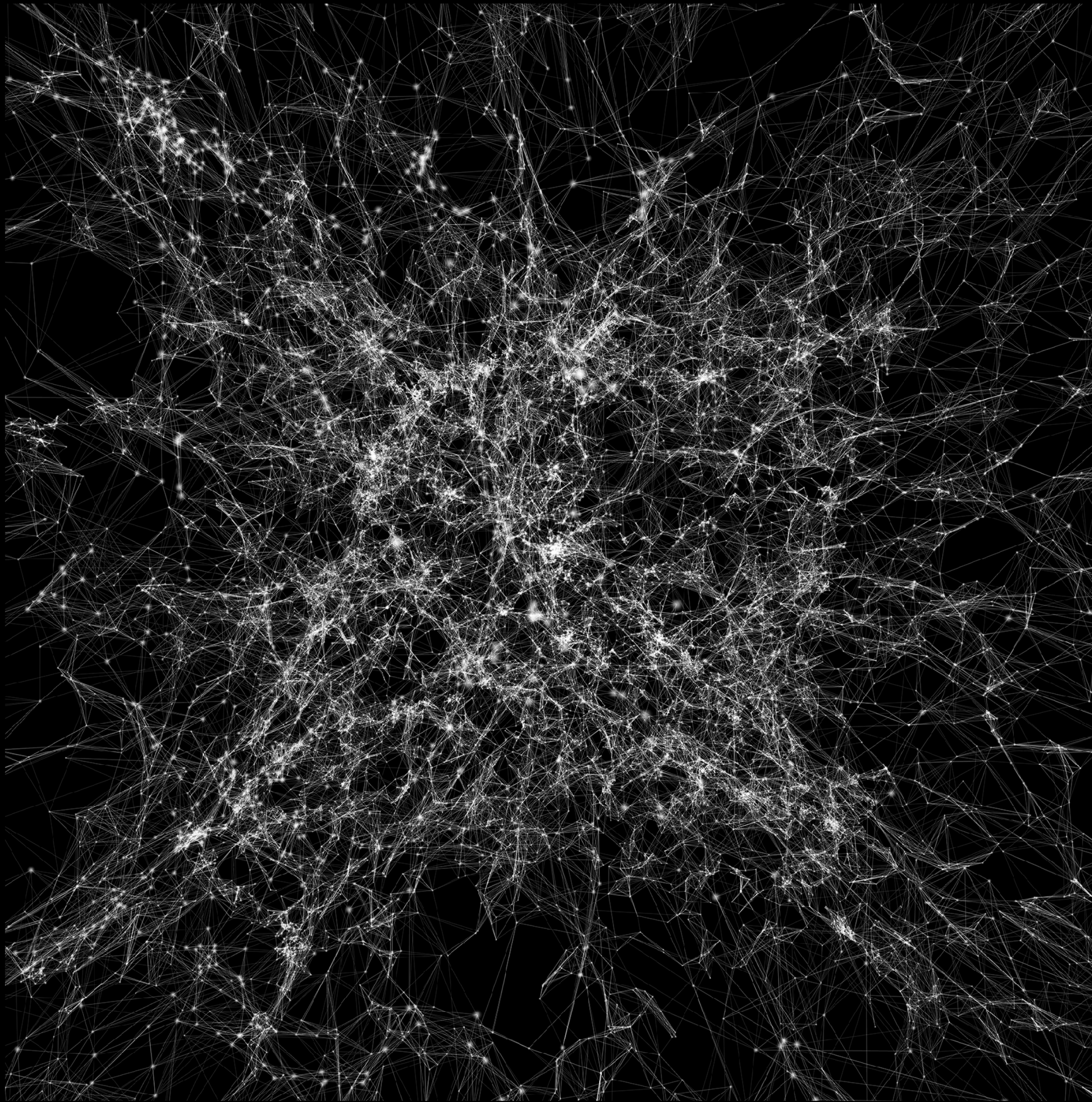
»we live in brain«

Comment by Łukasz Erm
[youtube.com](#)

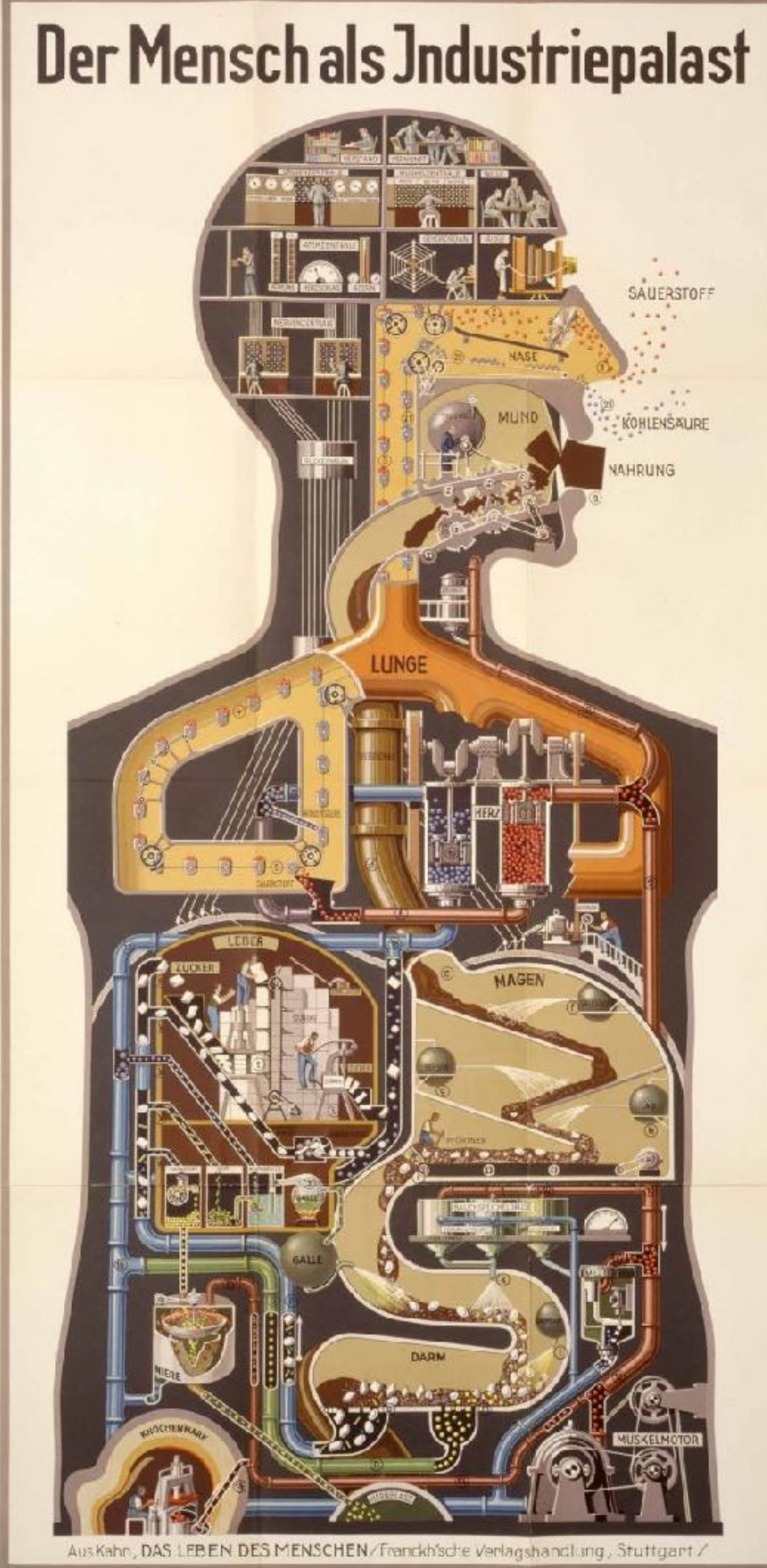
**»God apparently
thinks he's Jackson
Pollock.«**

Comment by Data1001

<http://gizmodo.com/breathtaking-visualization-of-the-universe-will-make-yo-1772363594>



Communication dynamics in complex brain networks
<https://www.nature.com/articles/nrn.2017.149>



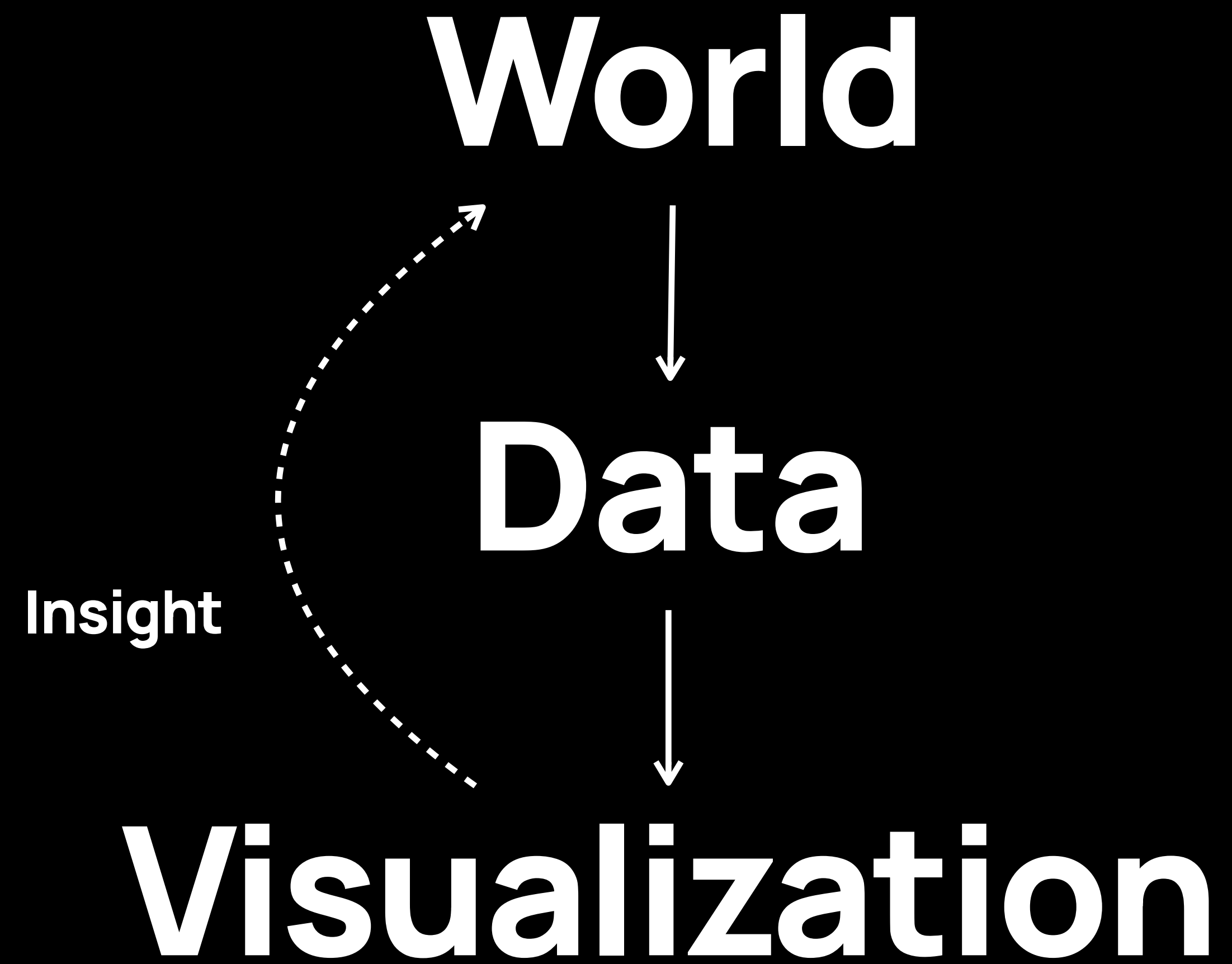
cultural layer

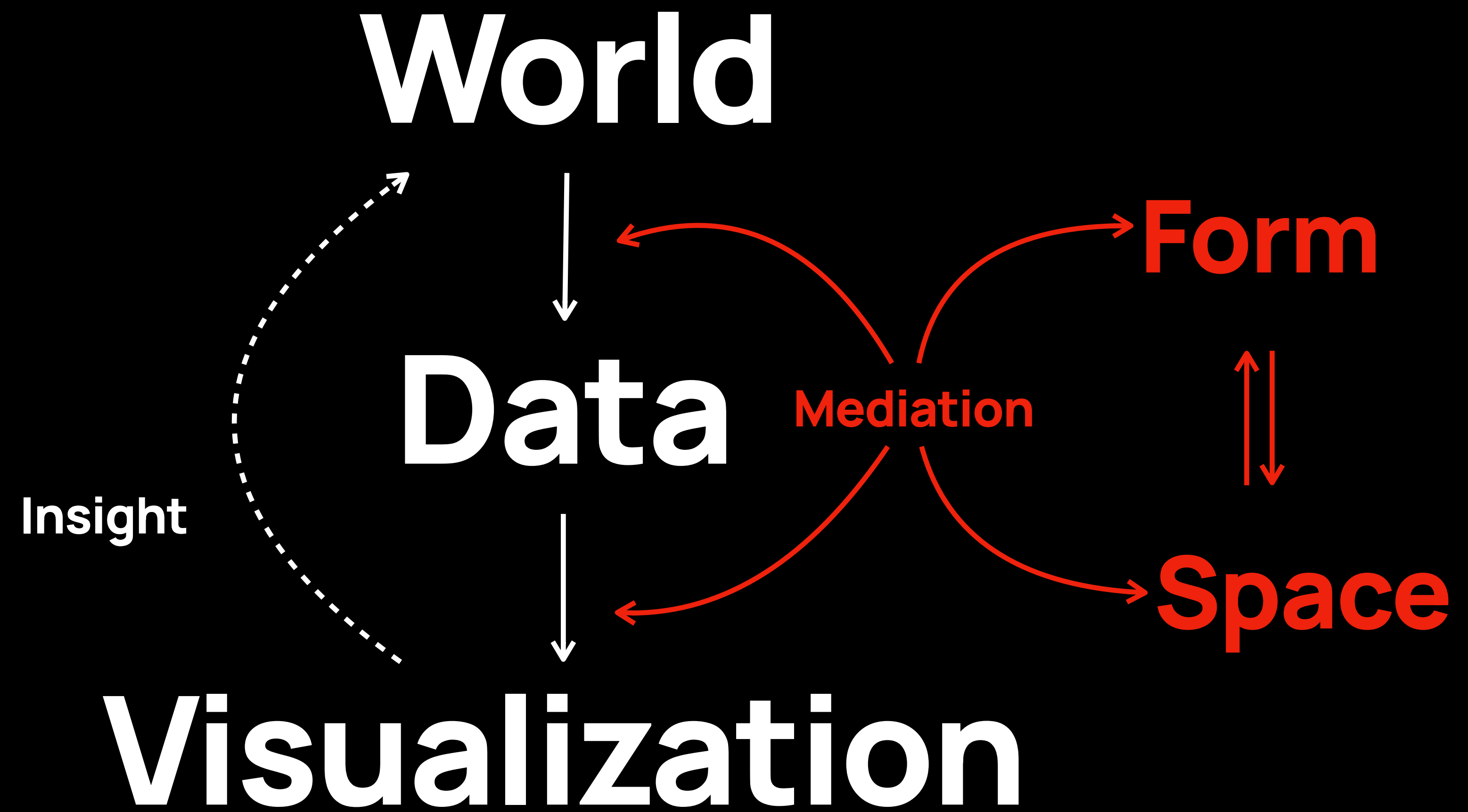
Mechanisation of the human

Interfaces

Naturalisation of the Machine

computer layer





**WE ARE AT THE
BEGINNING OF
RECORDED
HISTORY.**

Rian Hughes, Cult-ure, 2010

**IF EVERYTHING
BECOMES DATA,
WHAT ARE WE
MISSING?**

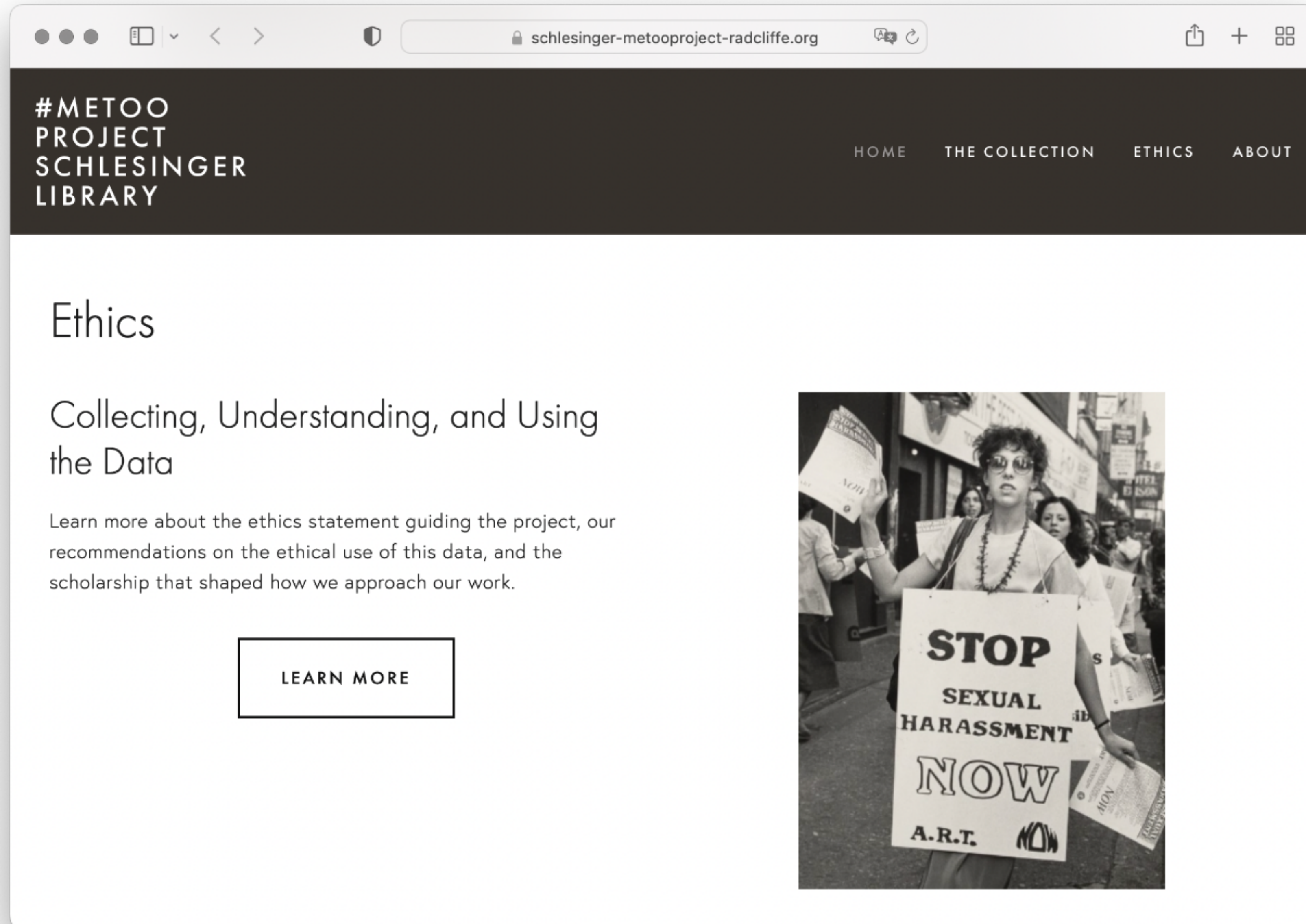
SITUATING #METOO

A project by Kim Albrecht with textual and conceptual support from Catherine D'Ignazio, Cole Martin, and Matthew Battles. Supported by metaLAB (at) Harvard & FU Berlin, Schlesinger Library, and the Harvard Data Science Initiative.

SITUATING #METOO

A project by Kim Albrecht with textual and conceptual support from Catherine D'Ignazio, Cole Martin, and Matthew Battles. Supported by metaLAB (at) Harvard & FU Berlin, Schlesinger Library, and the Harvard Data Science Initiative.

Collections of Scale



Source: www.schlesinger-metoo-project-radcliffe.org

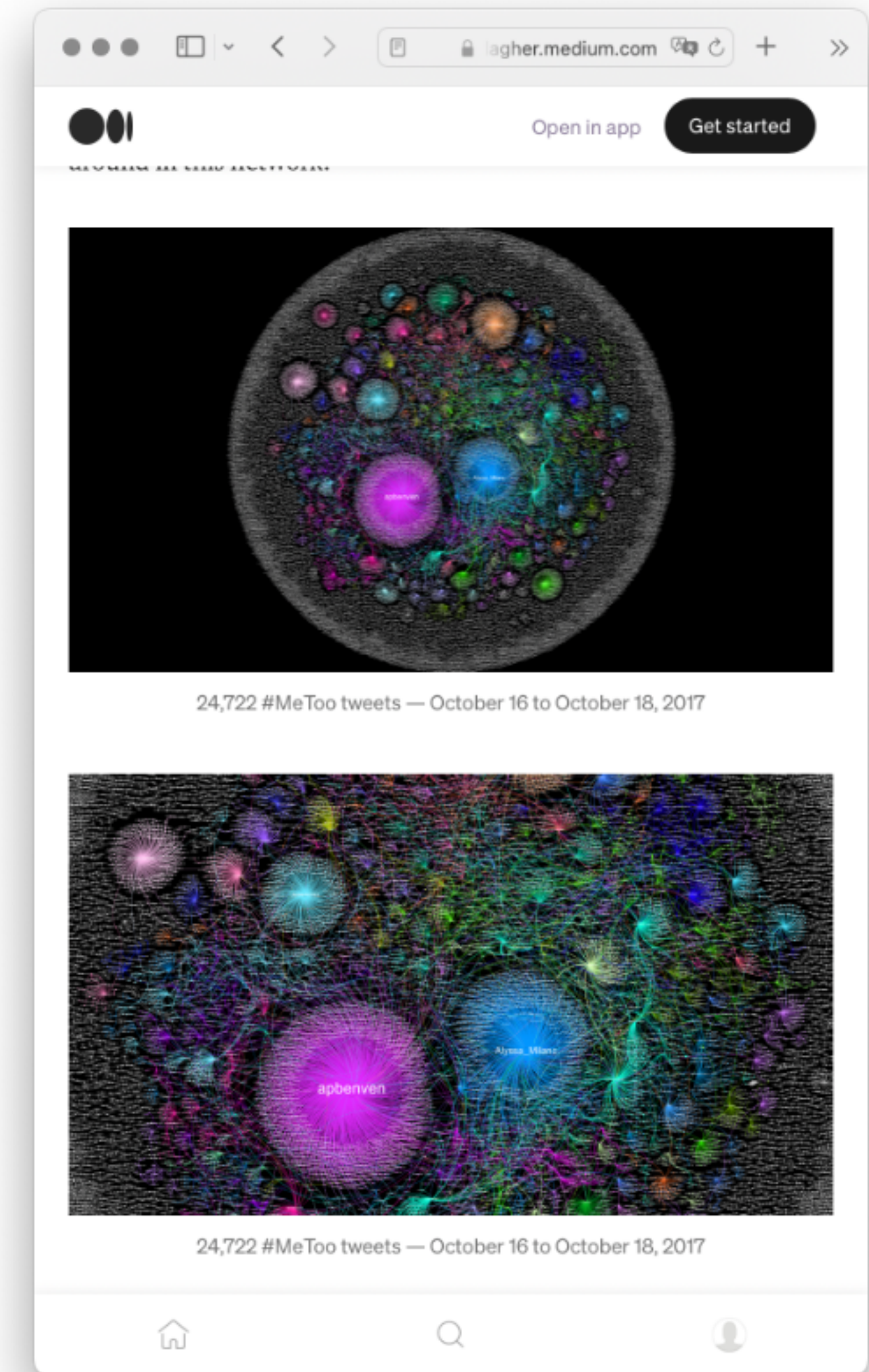
Visualizing a Movement



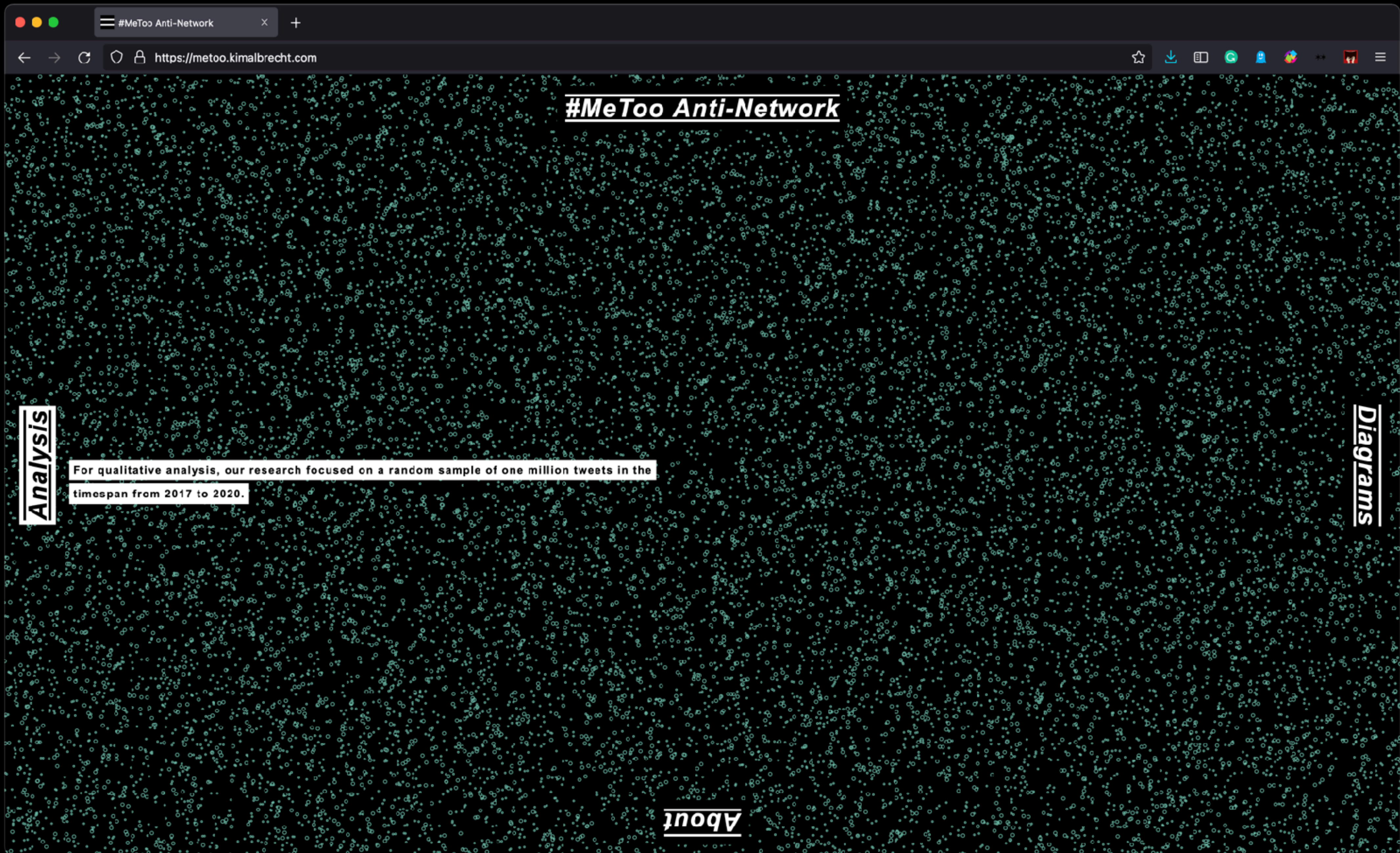
Source: metoomentum.com/



Source: metoorising.withgoogle.com/



Source: erin-gallagher.medium.com/metoo-hashtag-network-visualization-960dd5a97cdf



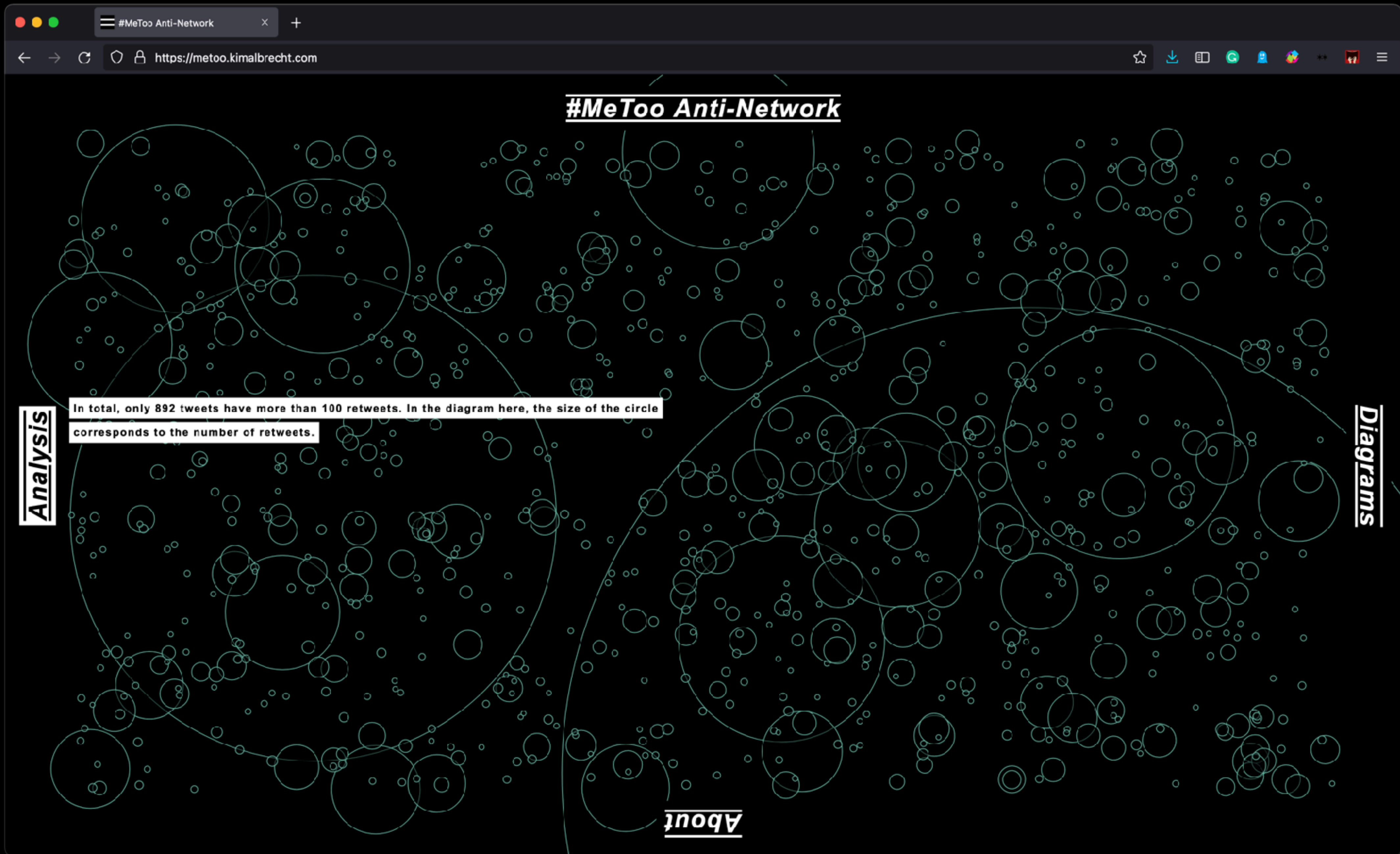
#MeToo Anti-Network

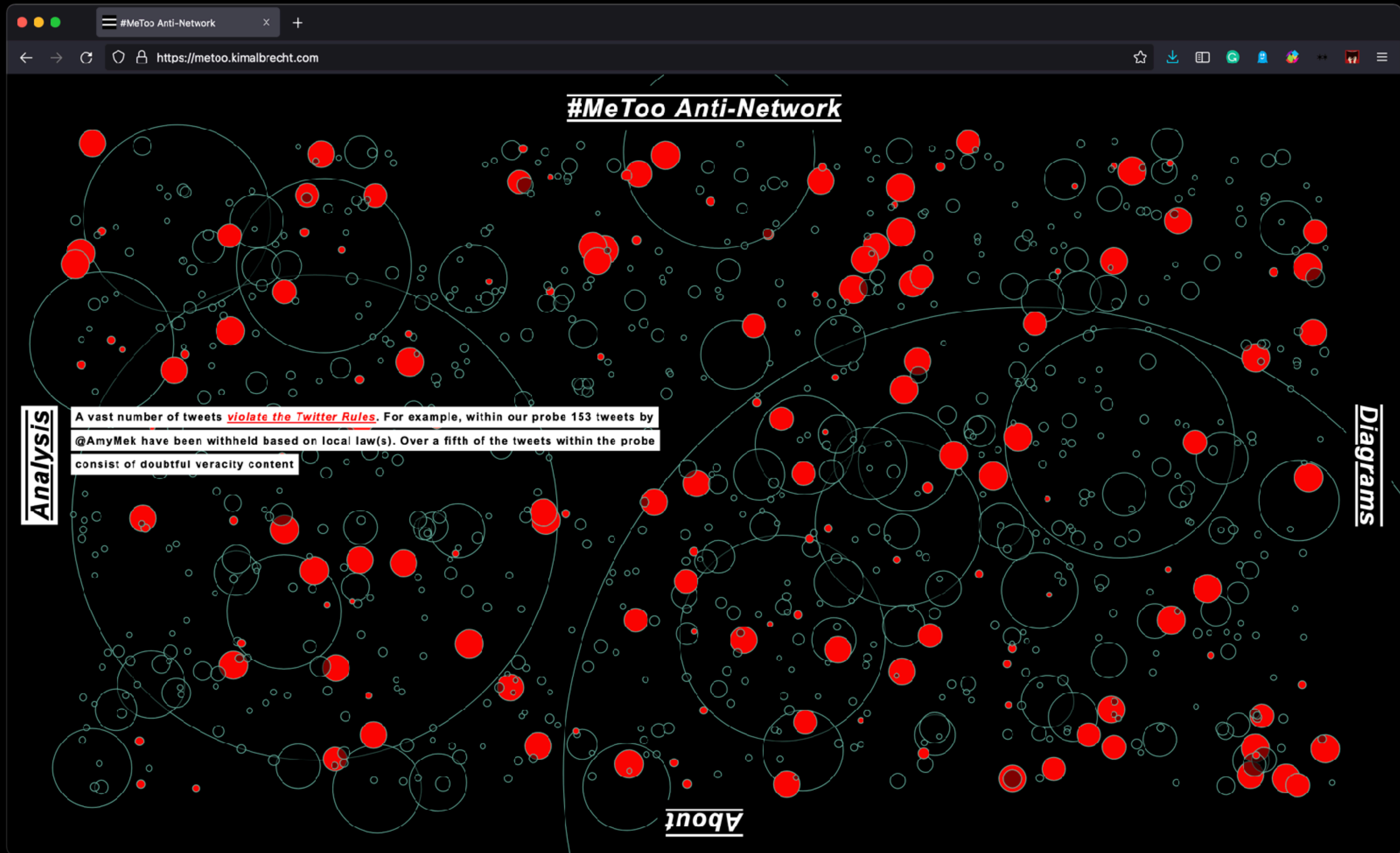
Analysis

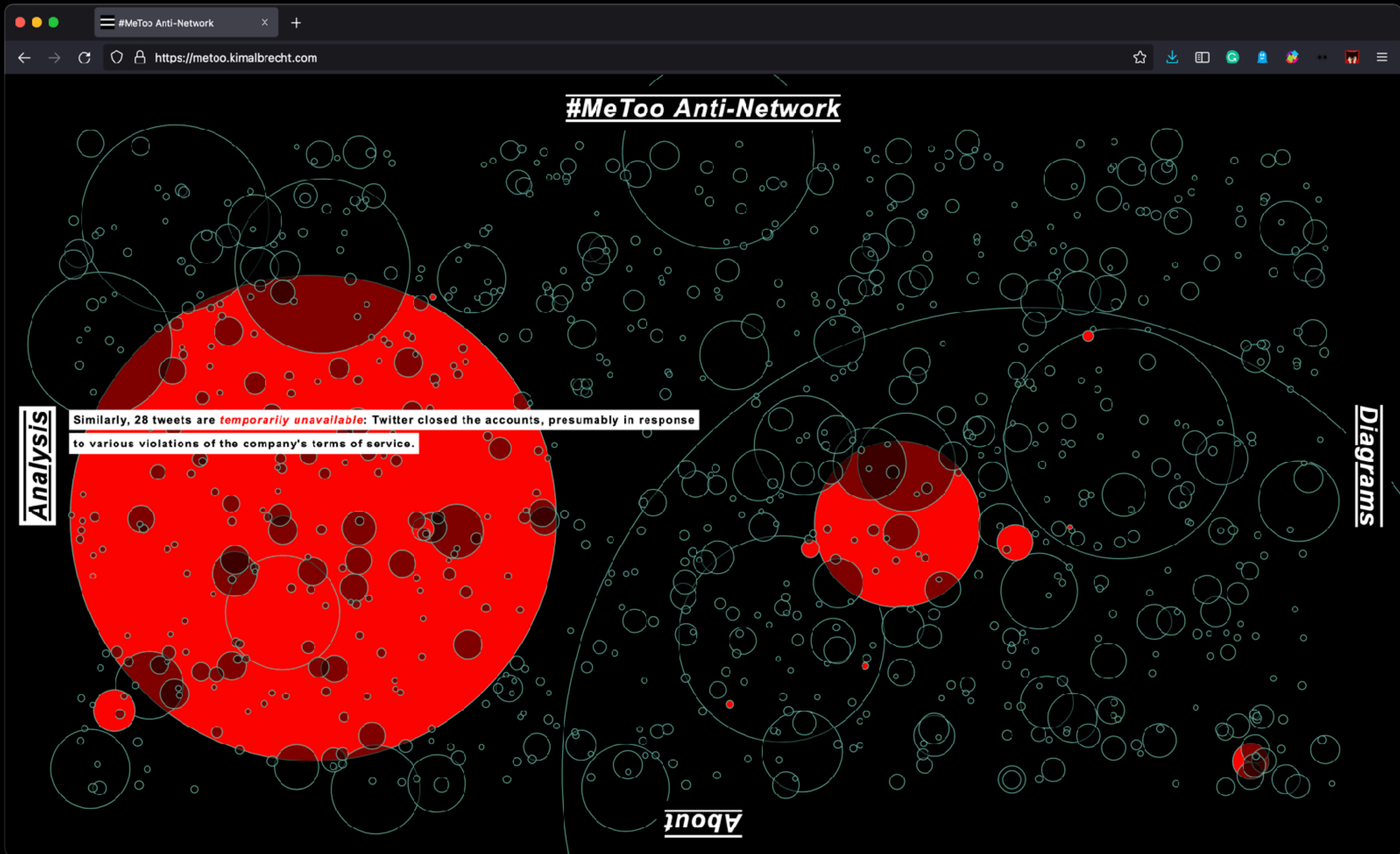
For qualitative analysis, our research focused on a random sample of one million tweets in the timespan from 2017 to 2020.

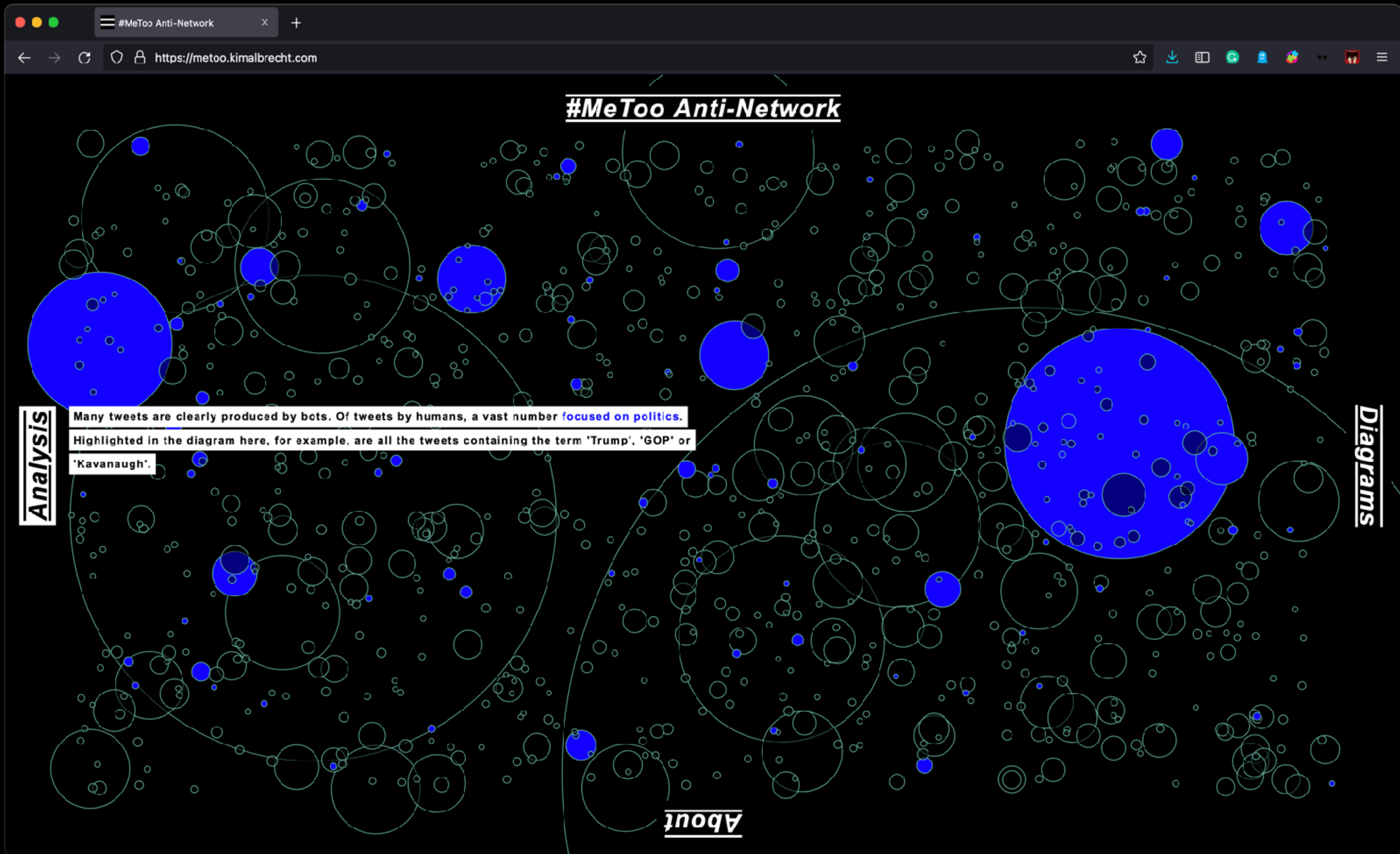
Diagrams

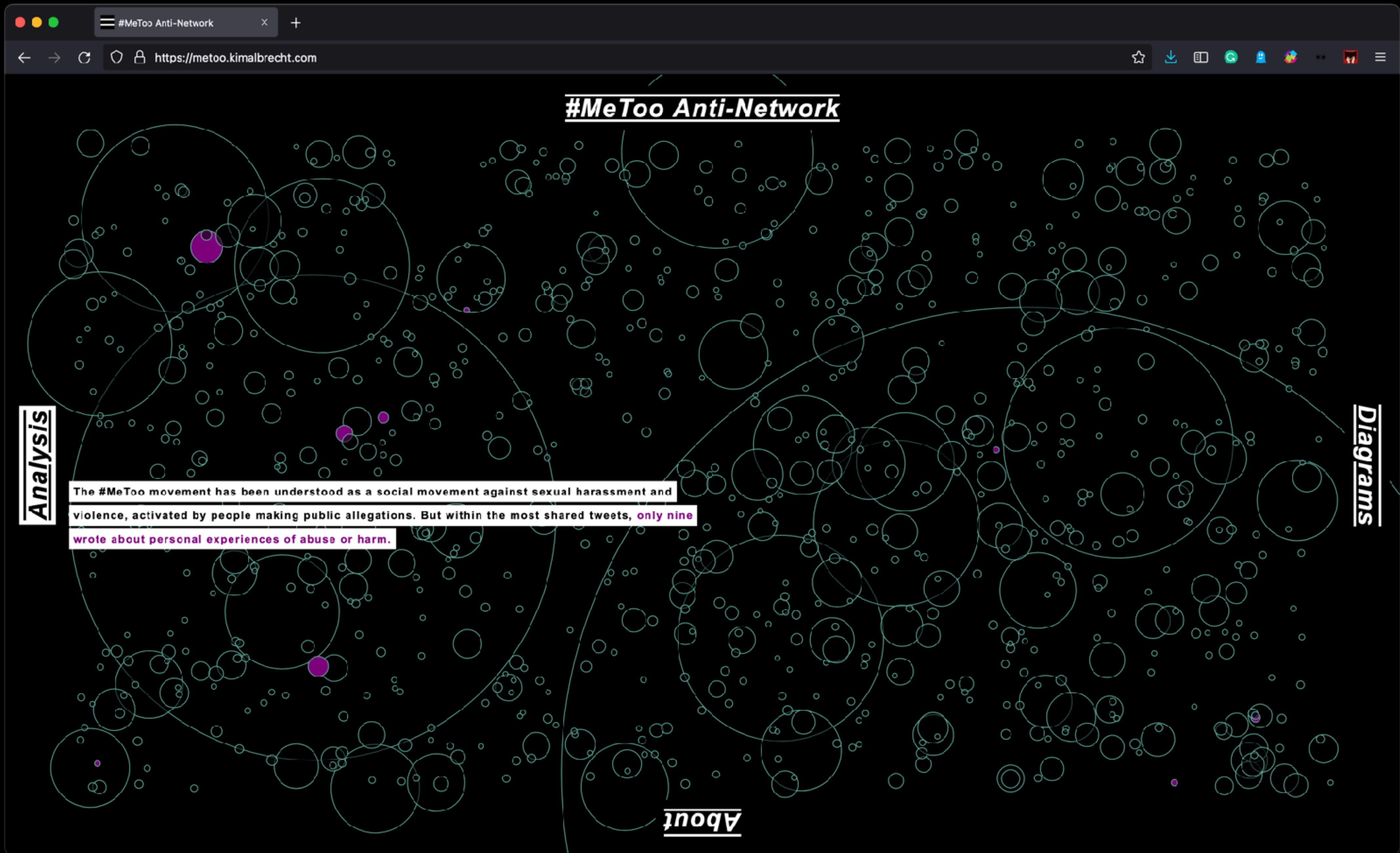
About











Interfacing the unobserved

metalab.kimalbrecht.com/18-metoo/ X

+

← → ↺ 🔒 https://metalab.kimalbrecht.com/18-metoo/05-tweet-analysis-tool/ ☆ ⬇ 📄 🔄 🐙 🌈 ** 🔴 ☰

Add your Name or Initials

This is tweet of 5973

[View on Twitter](#)

Likes: 0

Retweets: 0

Hashtags: TheHandmaidsTale Resist IBelieveChristineBlaseyFord BelieveSurvivors

Date: 2018-09-28 15:49:00+00:00

@MargaretAtwood Is this what you envisioned "The Time Before" looking like when #TheHandmaidsTale was published way back in 1984? Thank you for being a brilliant author. I've read your masterpiece three times. #Resist #IBelieveChristineBlaseyFord #BelieveSurvivors

Collect per Keyboard:
Left Arrow to collect: *allegations to visualize*
Right arrow to dismiss: *excluded tweets*
Up or Down to flag: *to discuss or not*

Collect Tweet

Dismiss Tweet

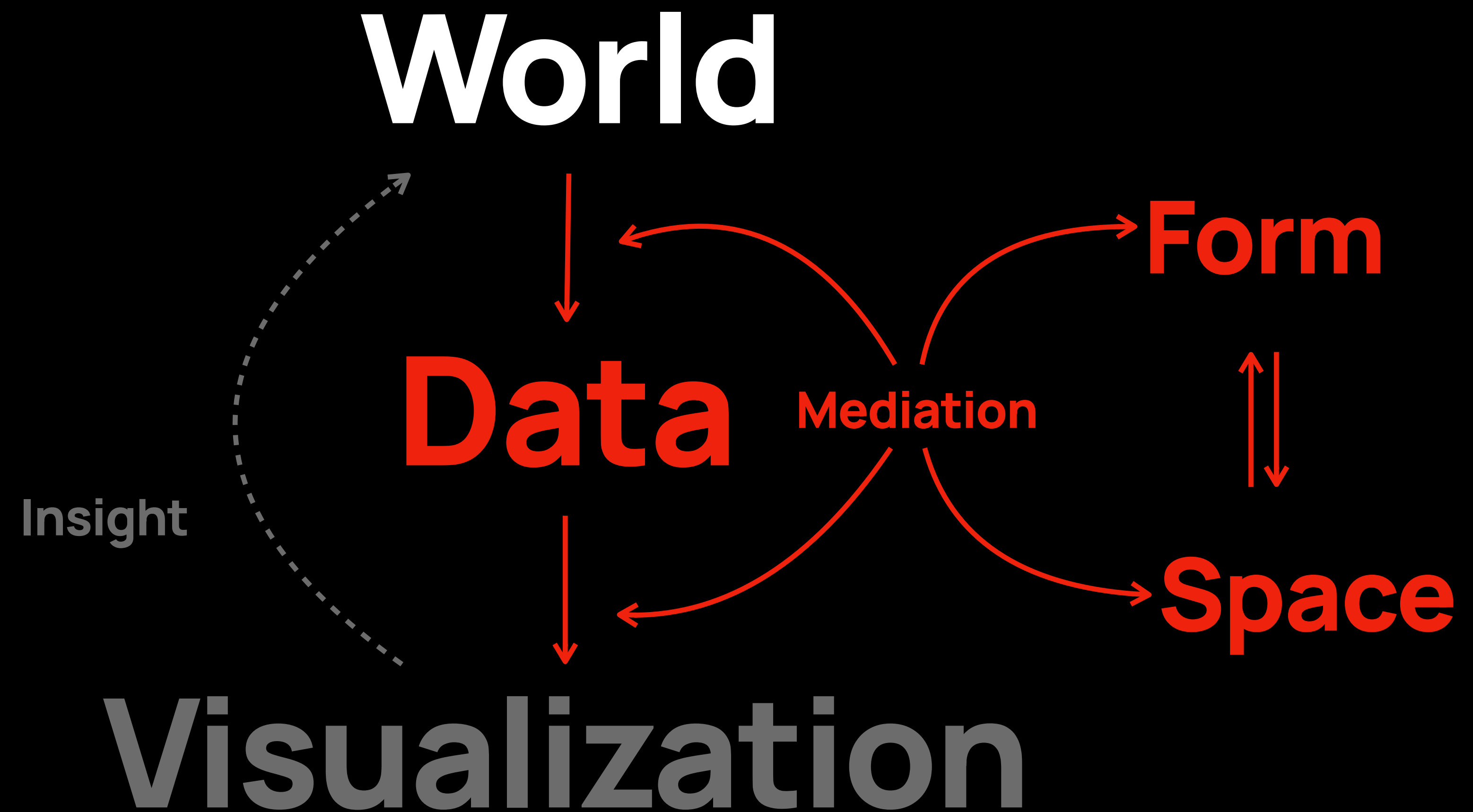
Flag Tweet

Comment

Save Dataset

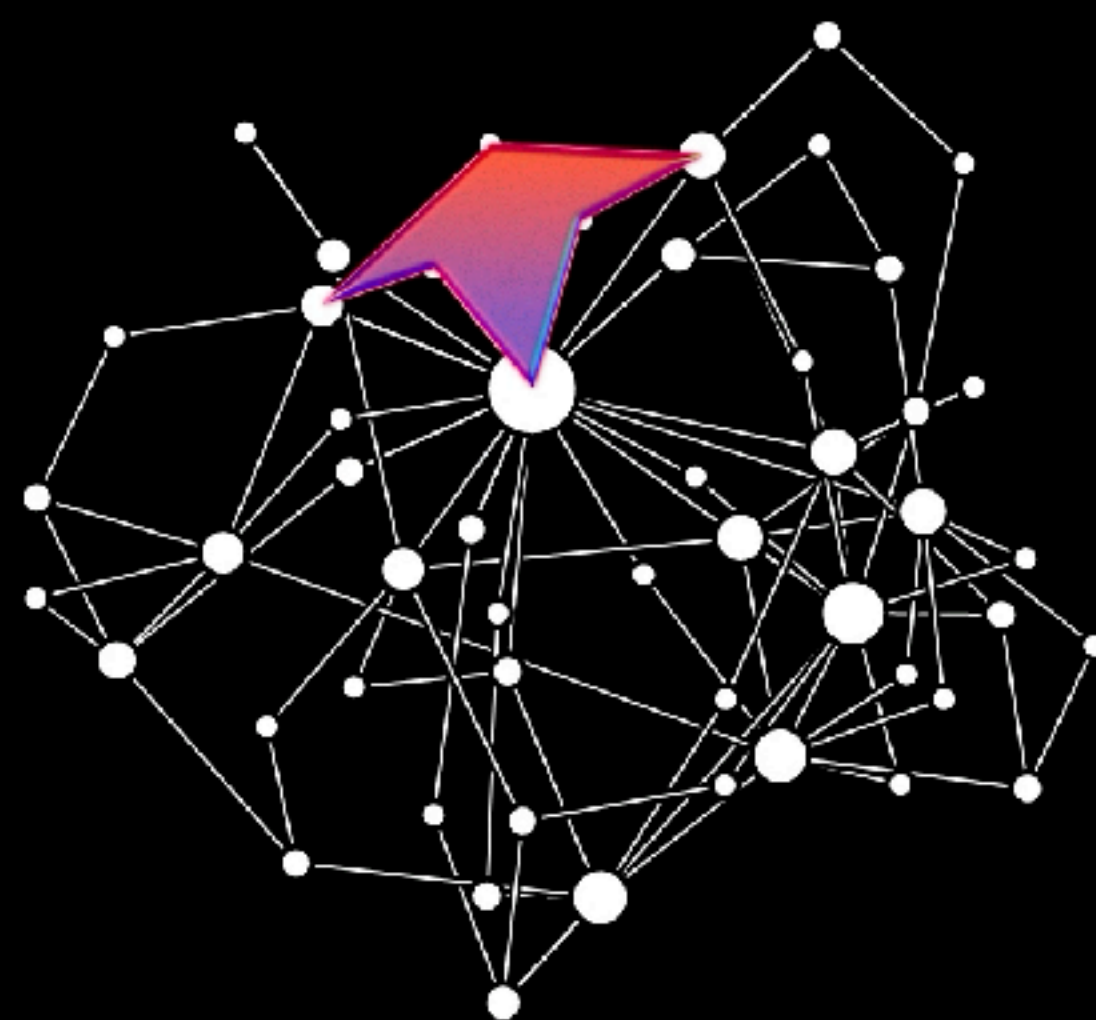
Datasets are automatically saved every 100 submissions and once all tweets are marked

**#METOO IS
NON-NETWORKED**



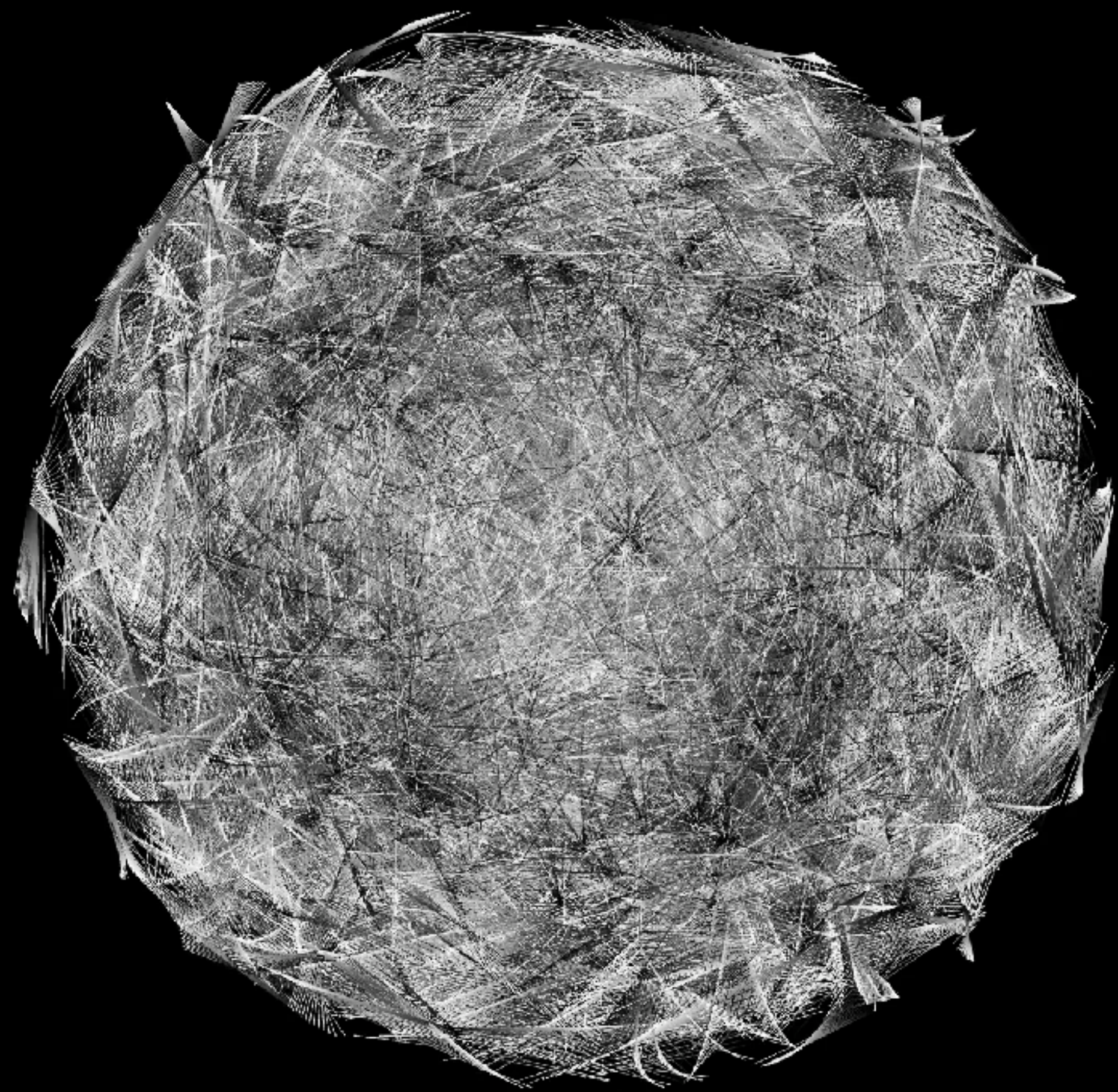
POST_NETWORKS

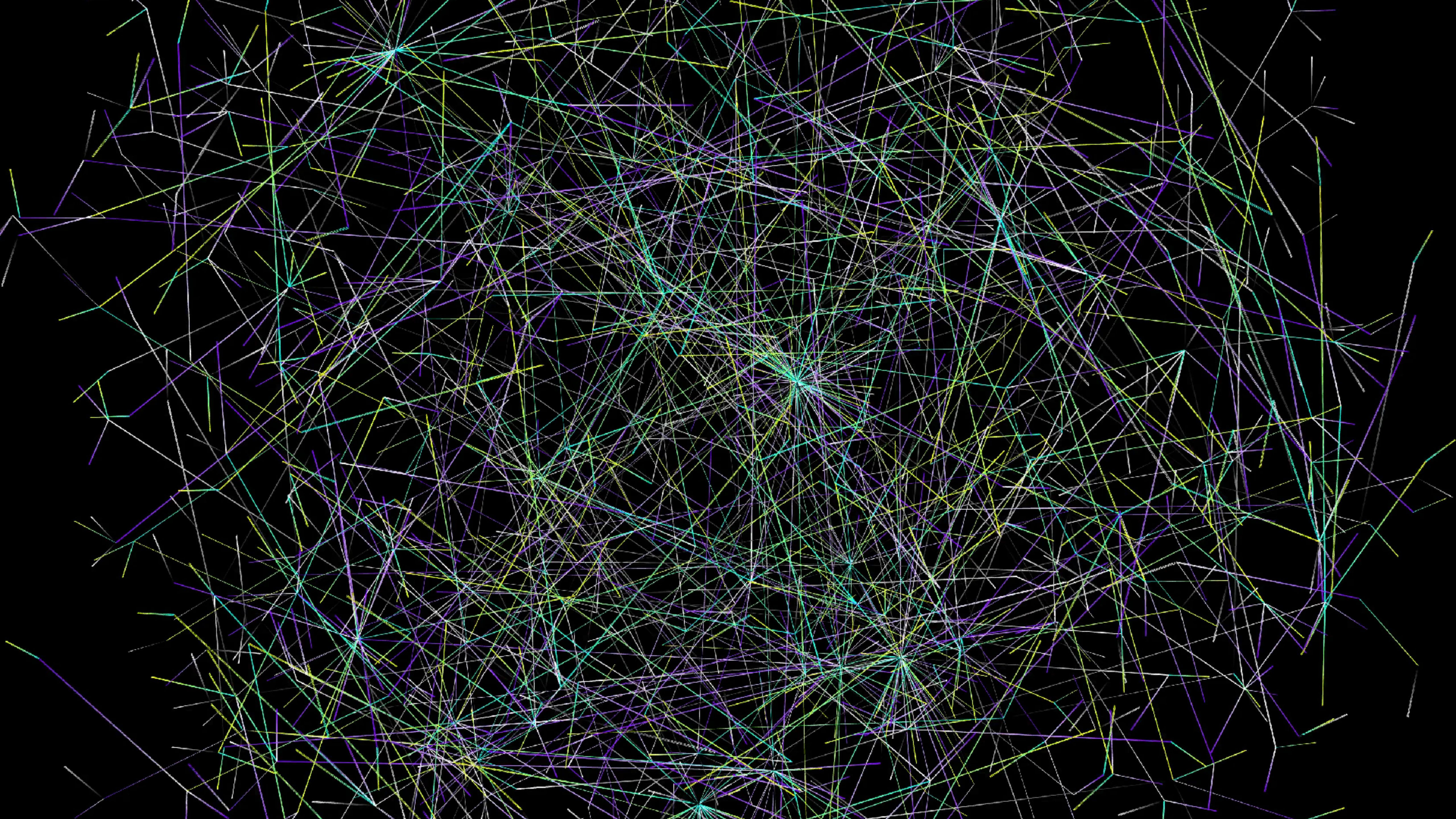
2022



POST_NETWORKS

2022





Knowledge Domains & Dimensions

https://chat.openai.com/c/e09588

Knowledge Domains & Dimensions

ChatGPT 3.5

You

Can you list your own knowledge domains in a table with meaningful data dimensions describing what you know?

ChatGPT

Certainly! Here's a table outlining some knowledge domains and their corresponding data dimensions:

Knowledge Domain	Data Dimensions	Description
General Knowledge	Facts, concepts, historical events, general information	A broad range of knowledge covering various subjects like science, history, geography, literature, arts, and more.
Science	Physics, chemistry, biology, astronomy, computer science	In-depth understanding of scientific principles, theories, laws, and discoveries across different scientific disciplines.
Technology	Computers, software, hardware, programming languages	Knowledge of technologies, computer systems, programming languages, software development, and emerging trends in the tech industry.
Mathematics	Algebra, calculus, statistics, geometry	Proficiency in mathematical concepts, equations, formulas, and problem-solving techniques.
Medicine	Anatomy, diseases, treatments, medical	Knowledge of human anatomy, common medical conditions, diagnostic methods, treatment options,

Message ChatGPT...

ChatGPT can make mistakes. Consider checking important information.

Sure! Here's a dataset in table format that represents the categories of knowledge I have. I've chosen 30 rows and 10 columns to provide a diverse range of categories:

Category	Subcategory 1	Subcategory 2	Subcategory 3	Subcategory 4	Subcategory 5	Subcategory 6	Subcategory 7	Subcategory 8	Subcategory 9
Science	Physics	Biology	Chemistry	Astronomy	Geology	Psychology	Mathematics	Computer Science	Neuroscience
History	Ancient	Medieval	Modern	World Wars	Renaissance	American	European	Asian	African
Literature	Fiction	Poetry	Drama	Prose	Classic	Modern	Fantasy	Non-fiction	Mystery
Technology	Artificial Intelligence	Robotics	Internet of Things	Machine Learning	Virtual Reality	Cybersecurity	Blockchain	Data Science	Software Engineering
Arts	Painting	Sculpture	Music	Dance	Theater	Film	Photography	Literature	Architecture
Geography	Continents	Countries	Cities	Landforms	Oceans	Climate	Population	Natural Resources	Maps
Sports	Football	Basketball	Tennis	Soccer	Baseball	Golf	Swimming	Athletics	Cricket
Health	Nutrition	Fitness	Medicine	Mental Health	Disease	Wellness	Aging	Genetics	Public Health
Philosophy	Epistemology	Ethics	Metaphysics	Logic	Aesthetics	Political	Philosophy of Mind	Philosophy of Science	Existentialism
Languages	English	Spanish	French	German	Chinese	Japanese	Arabic	Russian	Italian
Environment	Climate Change	Conservation	Renewable Energy	Pollution	Ecology	Sustainability	Biodiversity	Environmental Policy	Natural Disasters
Business	Marketing	Finance	Entrepreneurship	Management	Sales	E-commerce	Accounting	Human Resources	Supply Chain
Religion	Christianity	Islam	Hinduism	Buddhism	Judaism	Sikhism	Atheism	Mythology	Spirituality
Politics	Democracy	Dictatorship	International Relations	Political Systems	Political Ideologies	Public Policy	Human Rights	Governance	
Food	Cooking	Baking	Cuisine	Ingredients	Healthy Eating	Food Culture	Food History	Food Science	Food Sustainability
Education	Teaching	Learning	Curriculum	Educational Psychology	Assessment	Special Education	Educational Technology	Higher Education	
Mythology	Greek	Roman	Norse	Egyptian	Celtic	Mesopotamian	Indian	Chinese	African
Fashion	Clothing	Accessories	Fashion Design	Fashion History	Fashion Trends	Textiles	Luxury Fashion	Sustainable Fashion	Streetwear
Psychology	Cognitive	Social	Developmental	Personality	Abnormal	Positive	Industrial-Organizational	Educational	Forensic
Film	Action	Drama	Comedy	Thriller	Romance	Science Fiction	Horror	Animation	Documentary
Music	Rock	Pop	Hip Hop	Classical	Jazz	Electronic	R&B	Country	Alternative
Travel	Destinations	Adventure	Backpacking	Luxury Travel	Solo Travel	Road Trips	Food Travel	Sustainable Travel	Cultural Immersion
Mathematics	Algebra	Geometry	Calculus	Statistics	Number Theory	Linear Algebra	Probability	Cryptography	Mathematical Modeling
Science Fiction	Space Exploration	Time Travel	Artificial Life	Futuristic Technology	Alien Life	Dystopian Worlds	Cyberpunk	Alternate Realities	Post-Apocalyptic
Animals	Mammals	Birds	Reptiles	Amphibians	Fish	Insects	Marine Life	Endangered Species	Animal Behavior
Fashion	Clothing	Accessories	Fashion Design	Fashion History	Fashion Trends	Textiles	Luxury Fashion	Sustainable Fashion	Streetwear
DIY	Woodworking	Gardening	Home Improvement	Crafts	Sewing	Painting	Upcycling	Electronics	Automotive
Astronomy	Planets	Stars	Galaxies	Black Holes	Nebulae	Space Missions	Astronomical Phenomena	Cosmology	Astrobiology
Sports	Football	Basketball	Tennis	Soccer	Baseball	Golf	Swimming	Athletics	Cricket
Health	Nutrition	Fitness	Medicine	Mental Health	Disease	Wellness	Aging	Genetics	Public Health
Philosophy	Epistemology	Ethics	Metaphysics	Logic	Aesthetics	Political	Philosophy of Mind	Philosophy of Science	Existentialism

Please note that this is just a sample dataset, and the actual breadth of knowledge I possess is much more extensive.

Animals

Amphibians
Birds
Endangered
Fish
Invertebrates
Mammals
Marine Life
Pets
Reptiles
Wildlife

Arts

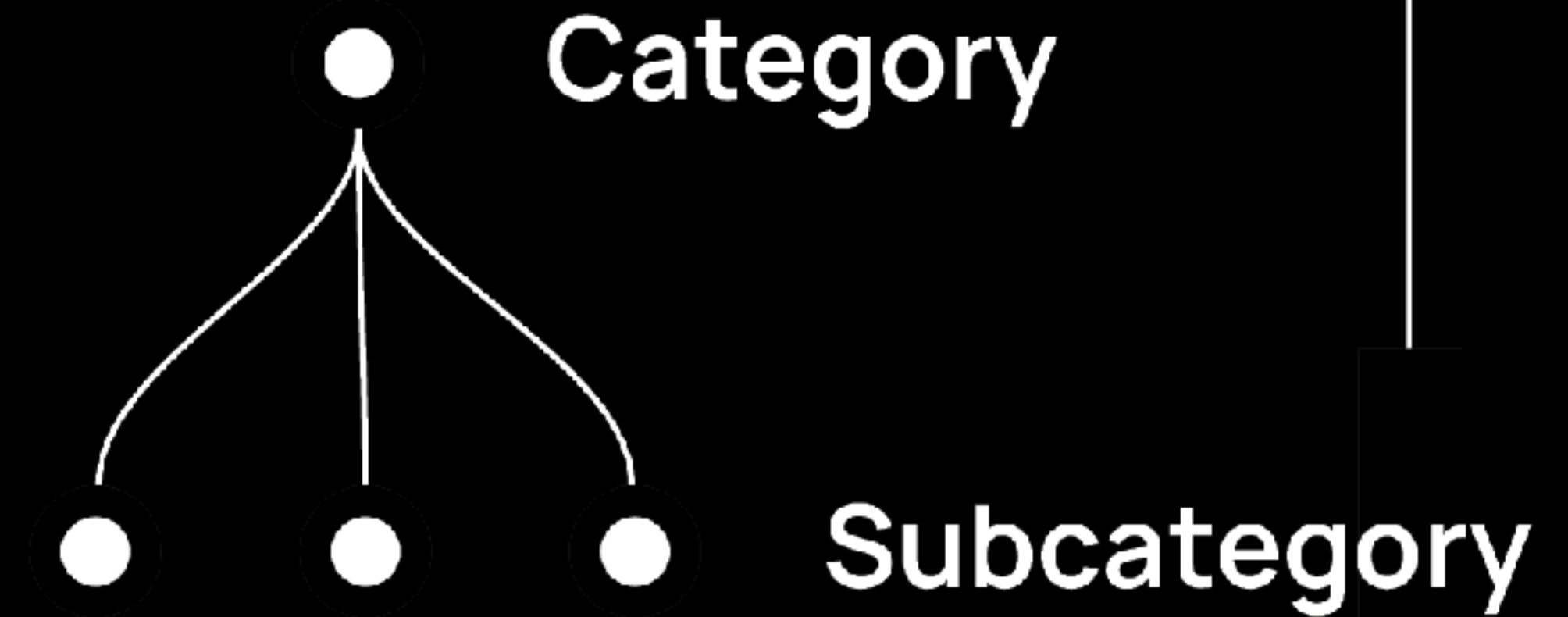
Architecture
Ceramics
Dance
Digital Art
Drawing
Fashion
Film
Installation
Literature
Music
Painting
Performance
Performing Arts
Photography
Printmaking
Sculpture
Theater
Theatre
Visual Arts
Astrobiology

Travel

Machine Learning
Mobile Devices
Nanotechnology
Programming
Renewable Energy
Robotics
Software
Software Development
Telecommunications
Virtual Reality
Accommodation
Activities
Adventure
Backpacking
Beaches
Budget Travel
Cultural
Cultural Experiences
Destinations
Family Travel
Food & Dining
Historical Sites
Luxury
Mountains
Nature
Road Trips
Solo Travel
Sustainable Travel
Transportation
Wildlife

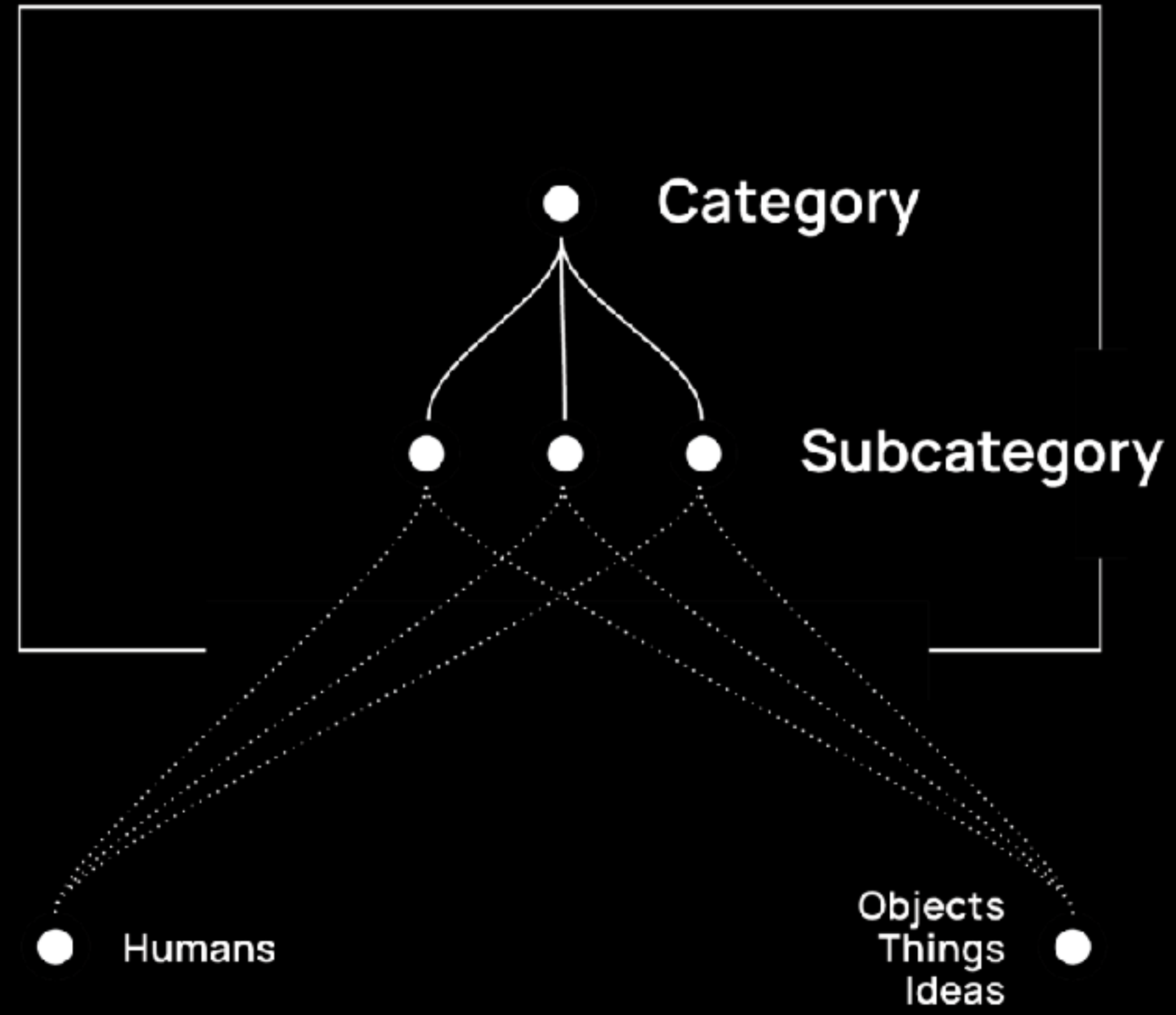
Scrape 01

Create a dataset in table format about the categories of all the knowledge you have. The table should contain at least 30 rows and 10 columns. Pick the dimensions as they make the most sense to you.



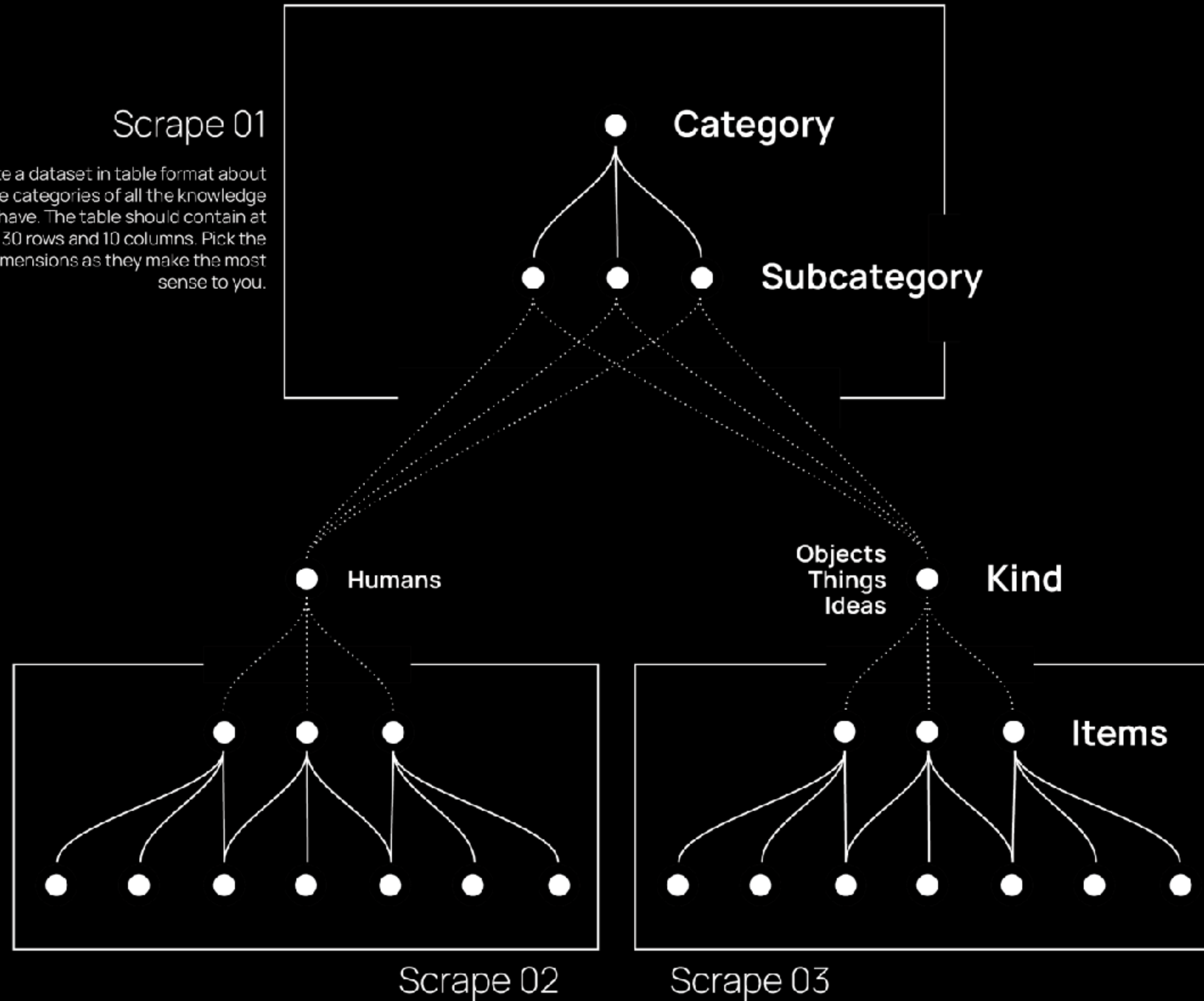
Scrape 01

Create a dataset in table format about the categories of all the knowledge you have. The table should contain at least 30 rows and 10 columns. Pick the dimensions as they make the most sense to you.



Scrape 01

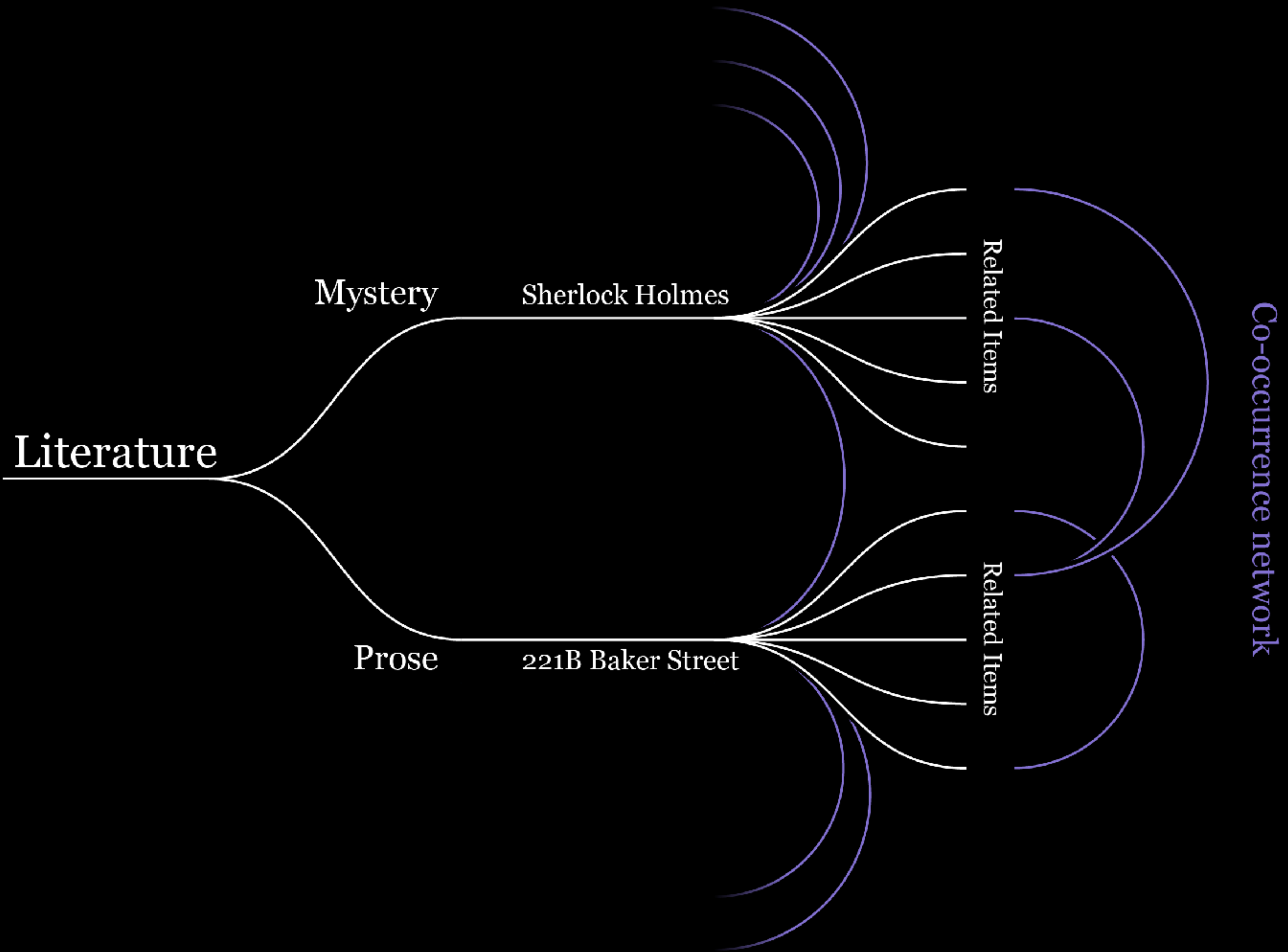
Create a dataset in table format about the categories of all the knowledge you have. The table should contain at least 30 rows and 10 columns. Pick the dimensions as they make the most sense to you.



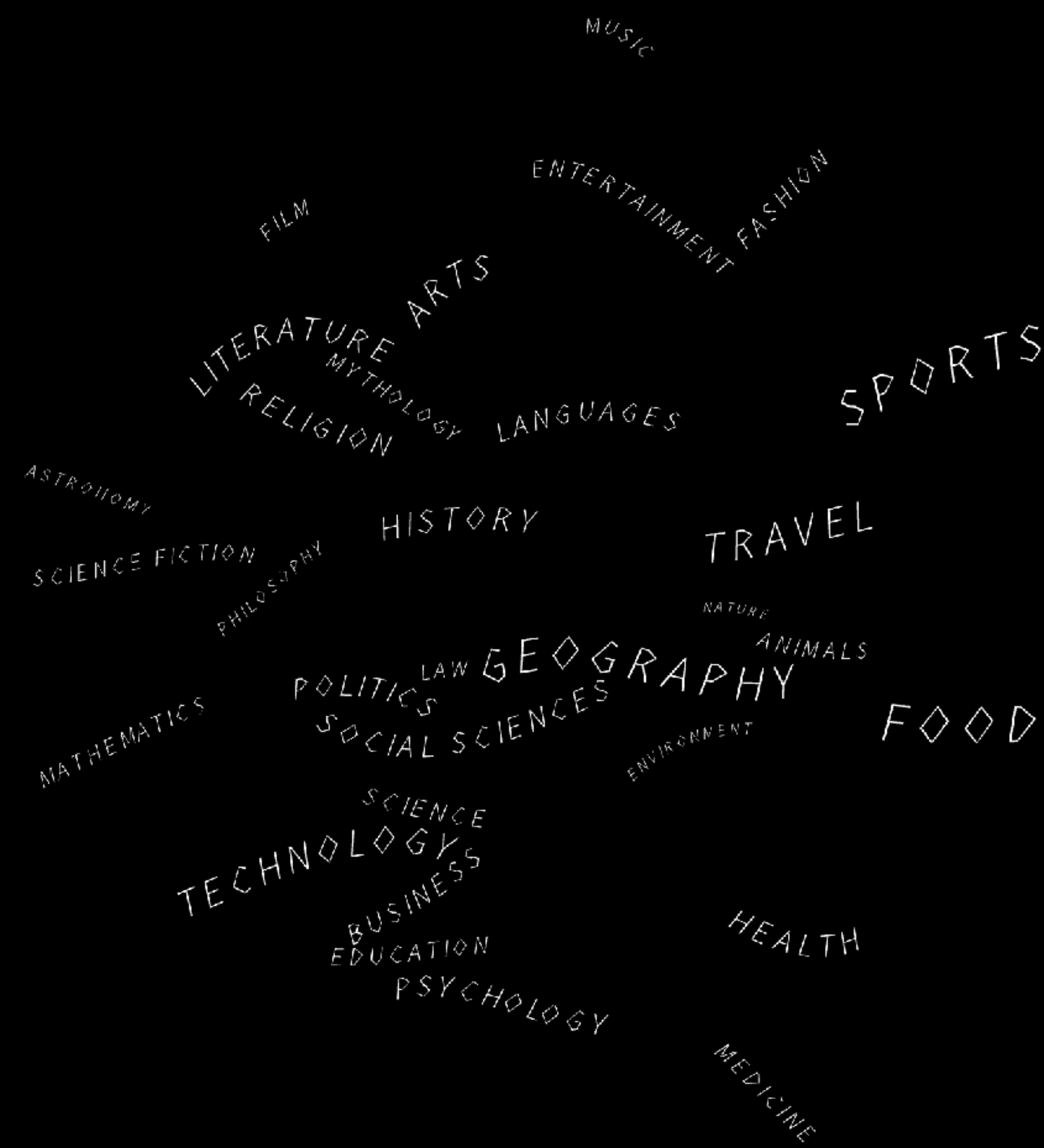
Related

List the most important [humans], [objects, things, ideas] in [arts] in the field of [film]. List their name, kind, category, description, related things, and importance (0 - 100) as a table.

name	kind	category	description	related	importance	field	subfield	temp	scrape
Sigmund Freud	Psychologist	Theorist	Known as the father of psychoanalysis, Freud developed theories of the unconscious mind	Psychoanalysis, dream analysis, psychosexual stages	95	Psychology	Abnormal	0.5	human
Carl Jung	Psychologist	Theorist	Jung expanded on Freud's theories and developed his own approach called analytical psychology	Archetypes, collective unconscious, introversion/extroversion	90	Psychology	Abnormal	0.5	human
Albert Ellis	Psychologist	Therapist	Ellis was a pioneer of cognitive-behavioral therapy (CBT) and Rational Emotive Behavior Therapy (REBT)	Cognitive-behavioral therapy (CBT), Rational Emotive Behavior Therapy (REBT)	85	Psychology	Abnormal	0.5	human
Aaron Beck	Psychiatrist	Therapist	Beck is known for his contributions to cognitive therapy and the development of Cognitive Behavioral Therapy (CBT)	Cognitive therapy, Cognitive Behavioral Therapy (CBT), negative thought patterns	85	Psychology	Abnormal	0.5	human
Carl Rogers	Psychologist	Therapist	Rogers is one of the founders of humanistic psychology and person-centered therapy. He emphasized unconditional positive regard and empathy.	Person-centered therapy, empathy, unconditional positive regard	80	Psychology	Abnormal	0.5	human
B.F. Skinner	Psychologist	Behaviorist	Skinner's work in operant conditioning and behavior analysis greatly influenced the understanding of learning and behavior.	Operant conditioning, behavior analysis, reinforcement, punishment	80	Psychology	Abnormal	0.5	human
Ivan Pavlov	Physiologist	Behaviorist	Pavlov is best known for his experiments on classical conditioning. While not directly focused on psychology, his work laid the foundation for behaviorist theories.	Classical conditioning, conditioned responses, associative learning	75	Psychology	Abnormal	0.5	human
Albert Bandura	Psychologist	Social	Bandura's social learning theory emphasized the role of observational learning and modeling in behavior.	Social learning theory, observational learning, modeling	75	Psychology	Abnormal	0.5	human
David Rosenhan	Psychologist	Researcher	Rosenhan conducted a famous study called "On Being Sane in Insane Places," which highlighted the unreliability of psychiatric diagnoses.	Labeling theory, misdiagnosis, psychiatric hospitals	70	Psychology	Abnormal	0.5	human
Elizabeth Loftus	Psychologist	Researcher	Loftus is a renowned expert on memory and eyewitness testimony. Her research demonstrated the malleability of human memory.	Memory, eyewitness testimony, false memories	70	Psychology	Abnormal	0.5	human
Sigmund Freud	Theorist		Founder of psychoanalysis, emphasized the role of the unconscious mind	Psychoanalytic theory, defense mechanisms, psychosexual development	95	Psychology	Abnormal	0	human
Carl Jung	Theorist		Developed analytical psychology, focused on the collective unconscious	Archetypes, introversion/extroversion, psychological types	90	Psychology	Abnormal	0	human
Albert Ellis	Therapist		Creator of Rational Emotive Behavior Therapy (REBT), a form of cognitive therapy	ABC model of emotions, irrational beliefs, cognitive restructuring	85	Psychology	Abnormal	0	human
Aaron Beck	Therapist		Pioneer of Cognitive Therapy, focused on cognitive distortions	Cognitive triad, cognitive restructuring, Beck Depression Inventory	90	Psychology	Abnormal	0	human
Carl Rogers	Therapist		Founder of client-centered therapy, emphasized unconditional positive regard	Person-centered therapy, self-actualization, empathy	85	Psychology	Abnormal	0	human
B.F. Skinner	Behaviorist		Known for operant conditioning and behavior modification	Skinner box, reinforcement, behavior analysis	80	Psychology	Abnormal	0	human
Albert Bandura	Psychologist		Social cognitive theorist, studied observational learning	Social learning theory, self-efficacy, Bobo doll experiment	85	Psychology	Abnormal	0	human
David Rosenhan	Researcher		Conducted the famous "Rosenhan experiment" on psychiatric diagnosis	Pseudopatient study, labeling theory, impact on the field of psychiatry	75	Psychology	Abnormal	0	human
Thomas Szasz	Psychiatrist		Critic of the concept of mental illness, advocated for individual rights	The Myth of Mental Illness, antipsychiatry movement	70	Psychology	Abnormal	0	human
R.D. Laing	Psychiatrist		Focused on the experience of individuals with schizophrenia	Existentialist approach, divided self, anti-psychiatry perspective	75	Psychology	Abnormal	0	human
Coco Chanel	Designer	Accessories	A legendary fashion designer known for her timeless designs and iconic brand. Chanel revolutionized women's fashion with her simple yet elegant style.	Little black dress, Chanel handbags, Chanel No. 5 perfume, Chanel suits	95	Fashion	Accessories	0.5	human
Manolo Blahnik	Shoe Designer	Accessories	A Spanish fashion designer famous for his luxurious and intricately designed high-heeled shoes.	Stiletto heels, Carrie Bradshaw (Sex and the City character), Blahnik's collaborations	90	Fashion	Accessories	0.5	human
Judith Leiber	Handbag Designer	Accessories	An American designer known for her exquisitely crafted and bejeweled evening bags.	Crystal-encrusted clutch bags, Leiber's animal-shaped bags, red carpet appearances	85	Fashion	Accessories	0.5	human
Louis Vuitton	Luxury Brand	Accessories	A French fashion house renowned for its high-end accessories, including handbags, luggage, and shoes.	Monogram canvas, LV logo, collaborations with artists like Takashi Murakami	90	Fashion	Accessories	0.5	human
Alexander McQueen	Fashion Designer	Accessories	A British designer known for his avant-garde and theatrical creations, including accessories.	Skull motifs, McQueen's statement belts, iconic armadillo shoes, collaborations	90	Fashion	Accessories	0.5	human
Elsa Peretti	Jewelry Designer	Accessories	An Italian designer known for her elegant and sculptural jewelry designs.	Tiffany & Co., Bone cuff bracelet, Open Heart pendant, collaborations with Tiffany & Co.	85	Fashion	Accessories	0.5	human
Christian Louboutin	Shoe Designer	Accessories	A French footwear designer famous for his red-soled high-heeled shoes, which have become a fashion icon.	Red soles, Pigalle pumps, Louboutin's collaborations with designers like Calvin Klein	95	Fashion	Accessories	0.5	human
Kate Spade	Handbag Designer	Accessories	An American designer known for her vibrant and playful handbags, accessories, and clothing.	Kate Spade New York, Spade's signature spade logo, colorful and whimsical designs	80	Fashion	Accessories	0.5	human
Coco Chanel	Designer	Accessories	A pioneering fashion designer known for her iconic handbags and jewelry.	Chanel No. 5 perfume, Little Black Dress	95	Fashion	Accessories	0	human
Louis Vuitton	Brand	Accessories	A luxury brand famous for its high-end luggage, handbags, and accessories.	Monogram canvas, LV logo	90	Fashion	Accessories	0	human
Manolo Blahnik	Designer	Footwear	Renowned for his elegant and luxurious shoe designs favored by celebrities.	Stiletto heels, Hangisi pumps	85	Fashion	Accessories	0	human
Judith Leiber	Designer	Handbags	Known for her intricately designed and embellished luxury handbags.	Crystal minaudières, Novelty clutches	80	Fashion	Accessories	0	human
Christian Louboutin	Designer	Footwear	Famous for his signature red-soled high-heeled shoes and bold designs.	Pigalle pumps, So Kate heels	90	Fashion	Accessories	0	human
Hermès	Brand	Accessories	A luxury brand celebrated for its high-quality leather goods and accessories.	Birkin bag, Silk scarves	95	Fashion	Accessories	0	human
Elsa Peretti	Designer	Jewelry	Noted for her organic and sculptural jewelry designs for Tiffany & Co.	Bone cuff, Open Heart pendant	85	Fashion	Accessories	0	human
Alexander McQueen	Designer	Accessories	Known for his avant-garde and theatrical accessories and fashion creations.	Skull clutches, Armadillo shoes	90	Fashion	Accessories	0	human
Kate Spade	Designer	Handbags	Recognized for her playful and colorful handbag designs and accessories.	Spade logo, Quilted bags	80	Fashion	Accessories	0	human
Tom Ford	Designer	Accessories	A fashion designer known for his luxurious and glamorous accessories.	Oversized sunglasses, Tassel earrings	85	Fashion	Accessories	0	human
Conrad Hilton	Entrepreneur	Hotelier	Founder of the Hilton Hotels chain, revolutionized the hotel industry with his innovative business model.	Hilton Hotels, hotel industry, hospitality	95	Travel	Accommodation	0.5	human
Kemmons Wilson	Entrepreneur	Hotelier	Founder of the Holiday Inn chain, introduced standardized accommodations and affordable travel.	Holiday Inn, hotel industry, franchising	90	Travel	Accommodation	0.5	human
Brian Chesky	Entrepreneur	Airbnb Co-Founder	Co-founder and CEO of Airbnb, a popular online marketplace for short-term rentals.	Airbnb, sharing economy, online travel, alternative accommodations	95	Travel	Accommodation	0.5	human
J. Willard Marriott	Entrepreneur	Hotelier	Founder of Marriott International, expanded the company into a global hospitality empire.	Marriott Hotels, hotel industry, hospitality	90	Travel	Accommodation	0.5	human
Isadore Sharp	Entrepreneur	Hotelier	Founder of Four Seasons Hotels and Resorts, known for luxury accommodations and personalized service.	Four Seasons Hotels, luxury hospitality, hotel industry	90	Travel	Accommodation	0.5	human
Barry Sternlicht	Entrepreneur	Hotelier	Founder of Starwood Hotels & Resorts, introduced the W Hotels brand known for its modern, urban accommodations.	Starwood Hotels, W Hotels, hotel industry, luxury hospitality	85	Travel	Accommodation	0.5	human
Bill Marriott Jr.	Businessman	Hotelier	Former CEO of Marriott International, played a key role in expanding the company globally.	Marriott International, hotel industry, hospitality	85	Travel	Accommodation	0.5	human



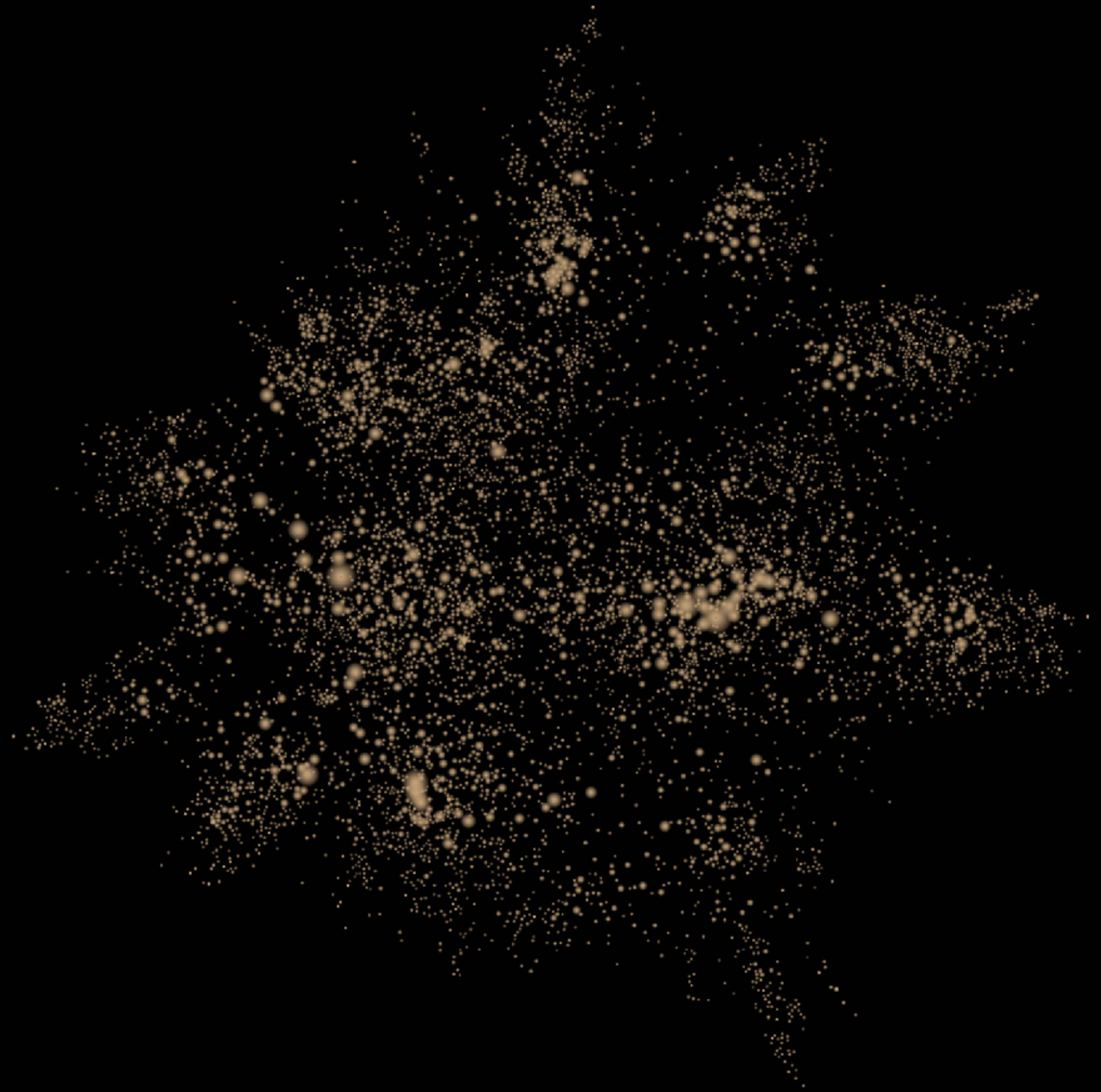
Category



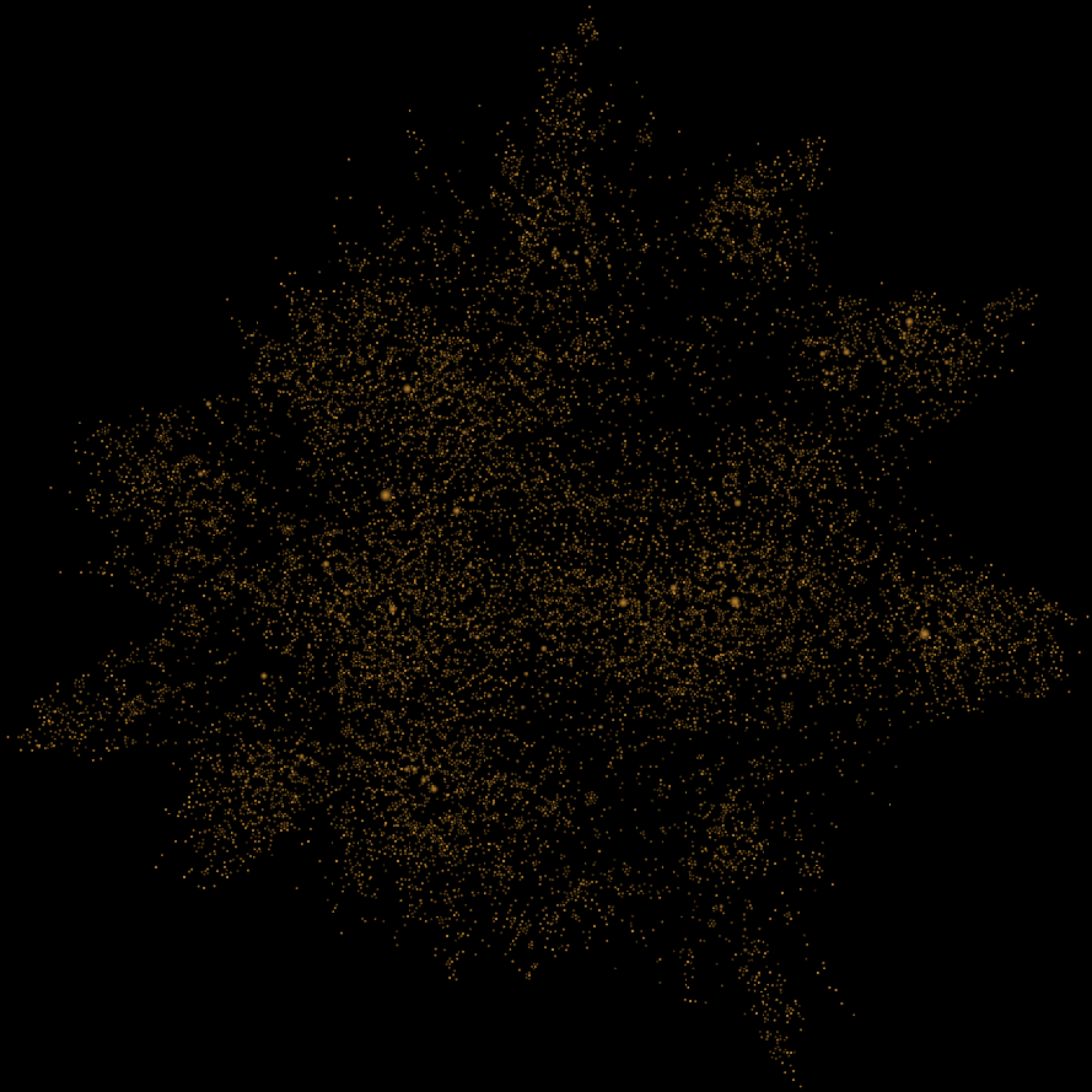
Subcategory

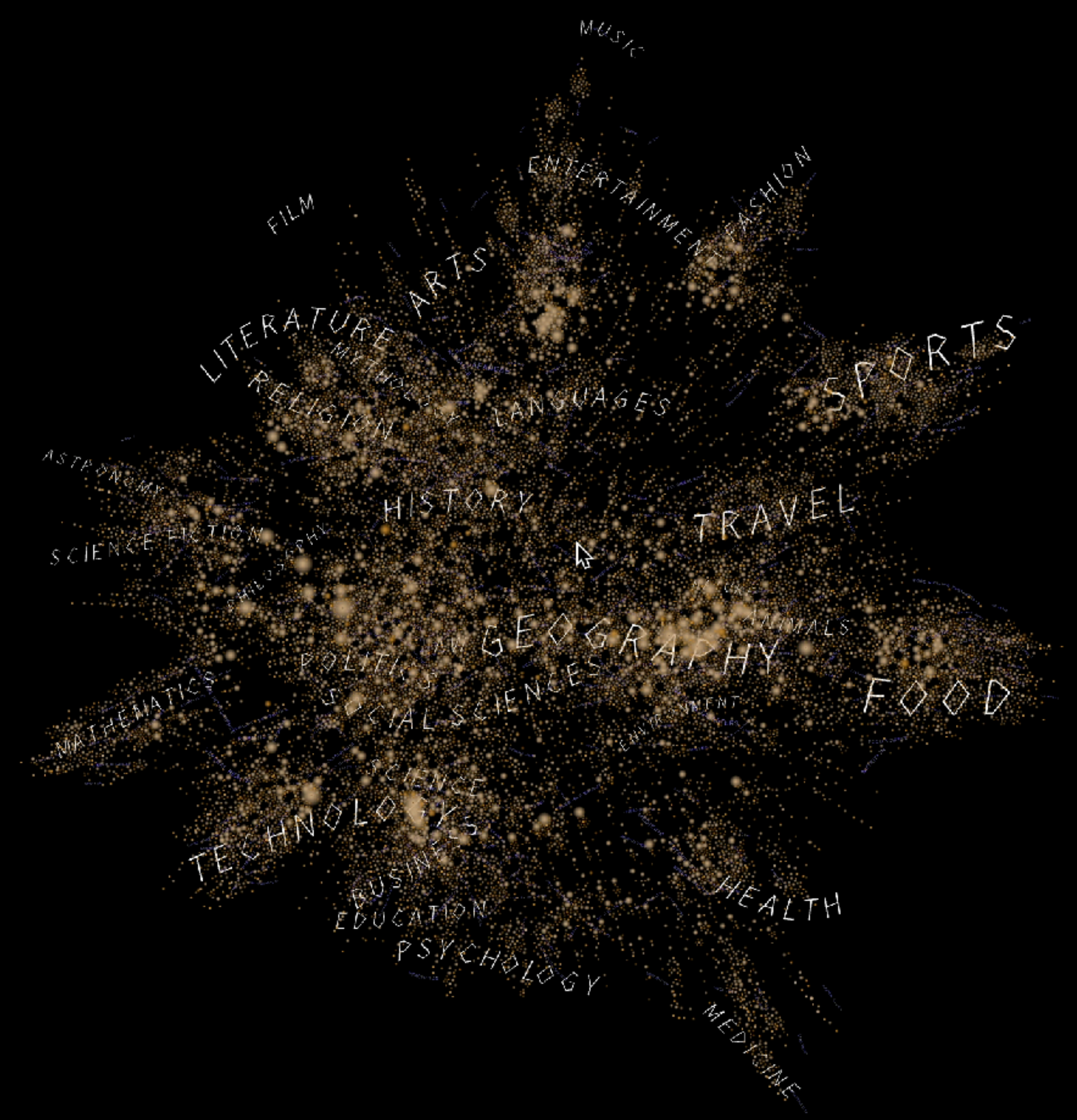


Items



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» Where there is nothing
to calculate, we don't
need computers.«

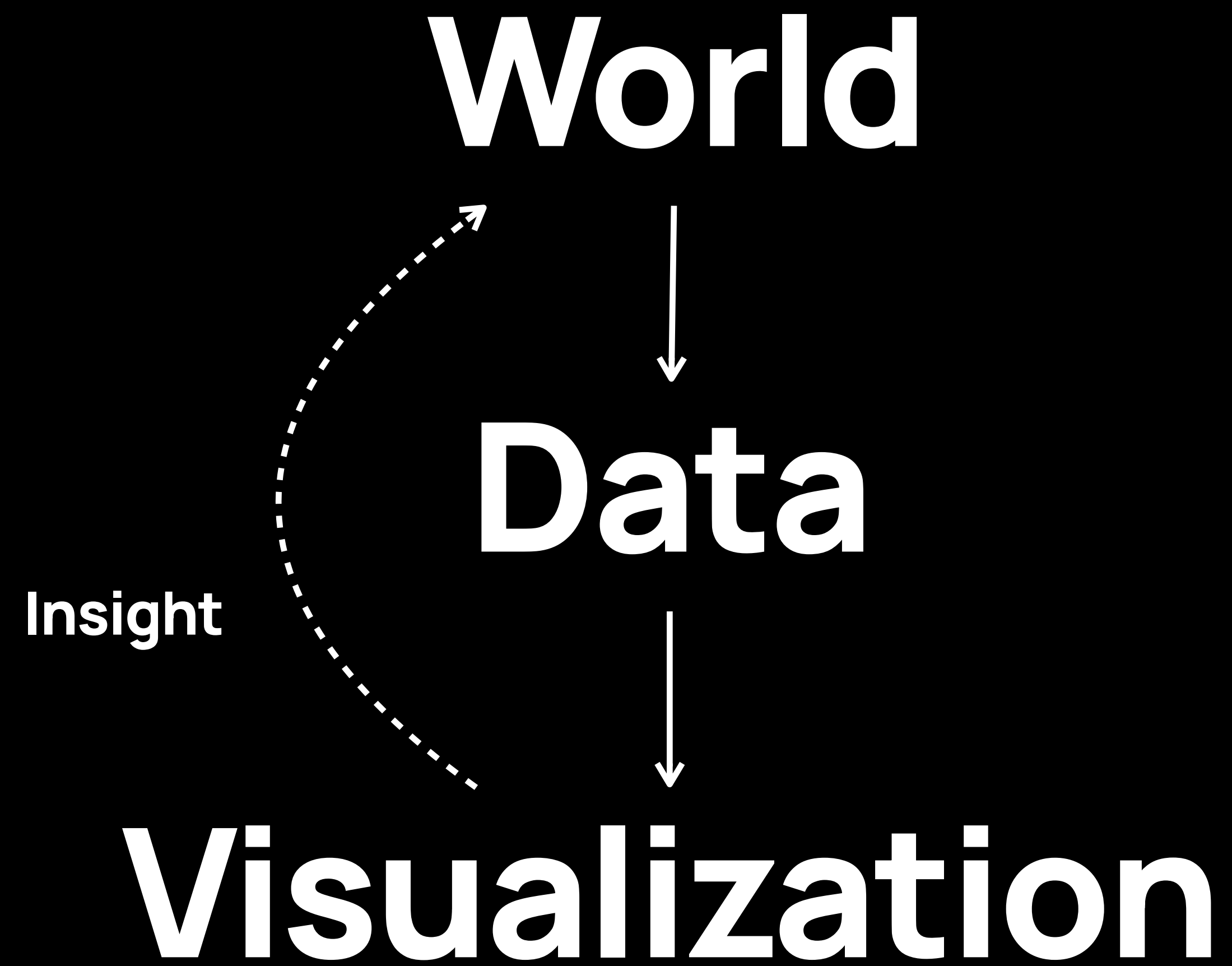
Frieder Nake

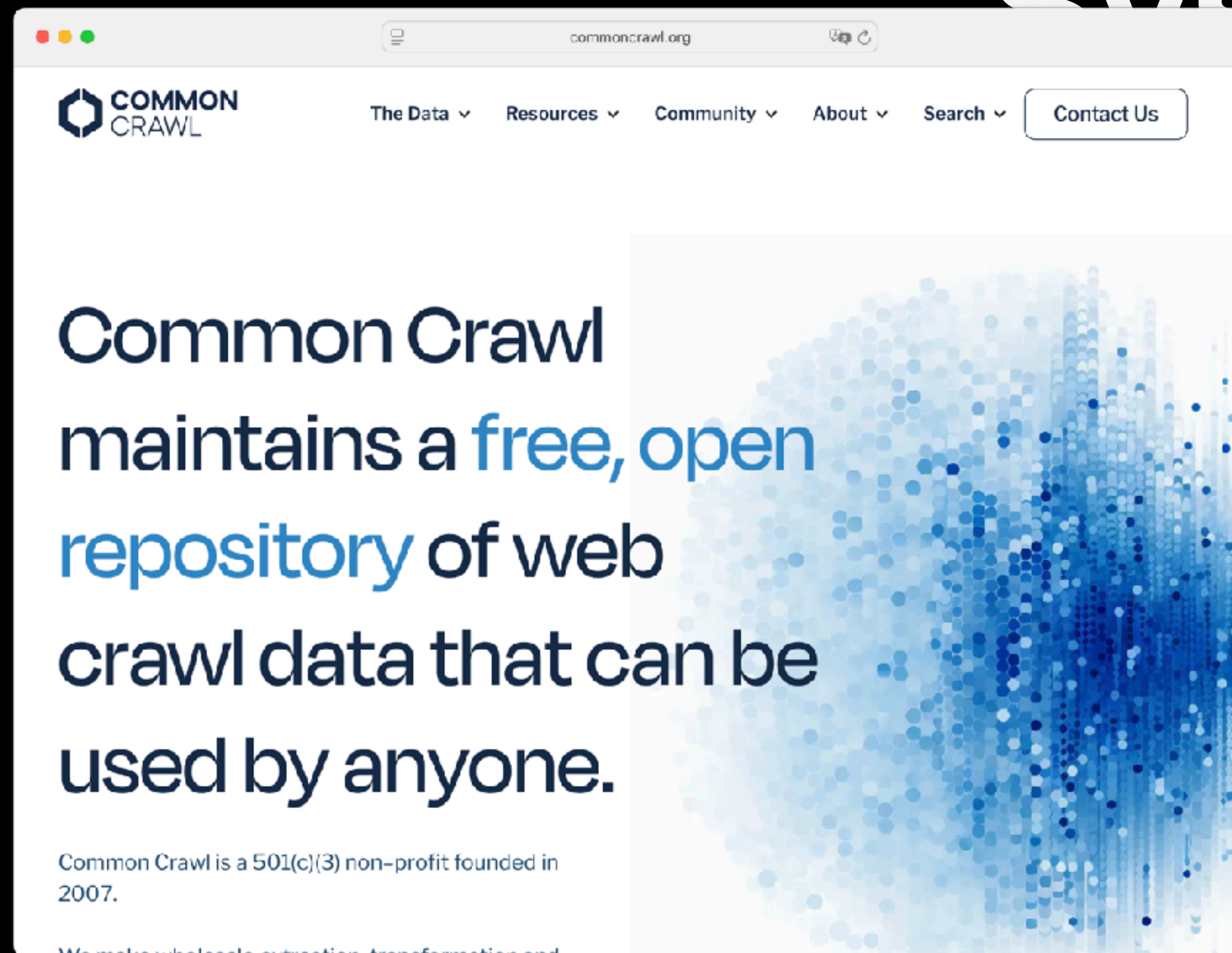
»And due to the capital required to build AI at scale and the ways of seeing that it optimizes AI systems are ultimately designed to serve existing dominant interests. In this sense, artificial intelligence is a registry of power«

Atlas of AI by Kate Crawford, 2021

» And due to the capital required to build AI at scale and the ways of seeing that it optimizes AI systems are ultimately designed to serve existing dominant interests. In this sense, artificial intelligence is a **registry of power**«

Atlas of AI by Kate Crawford, 2021





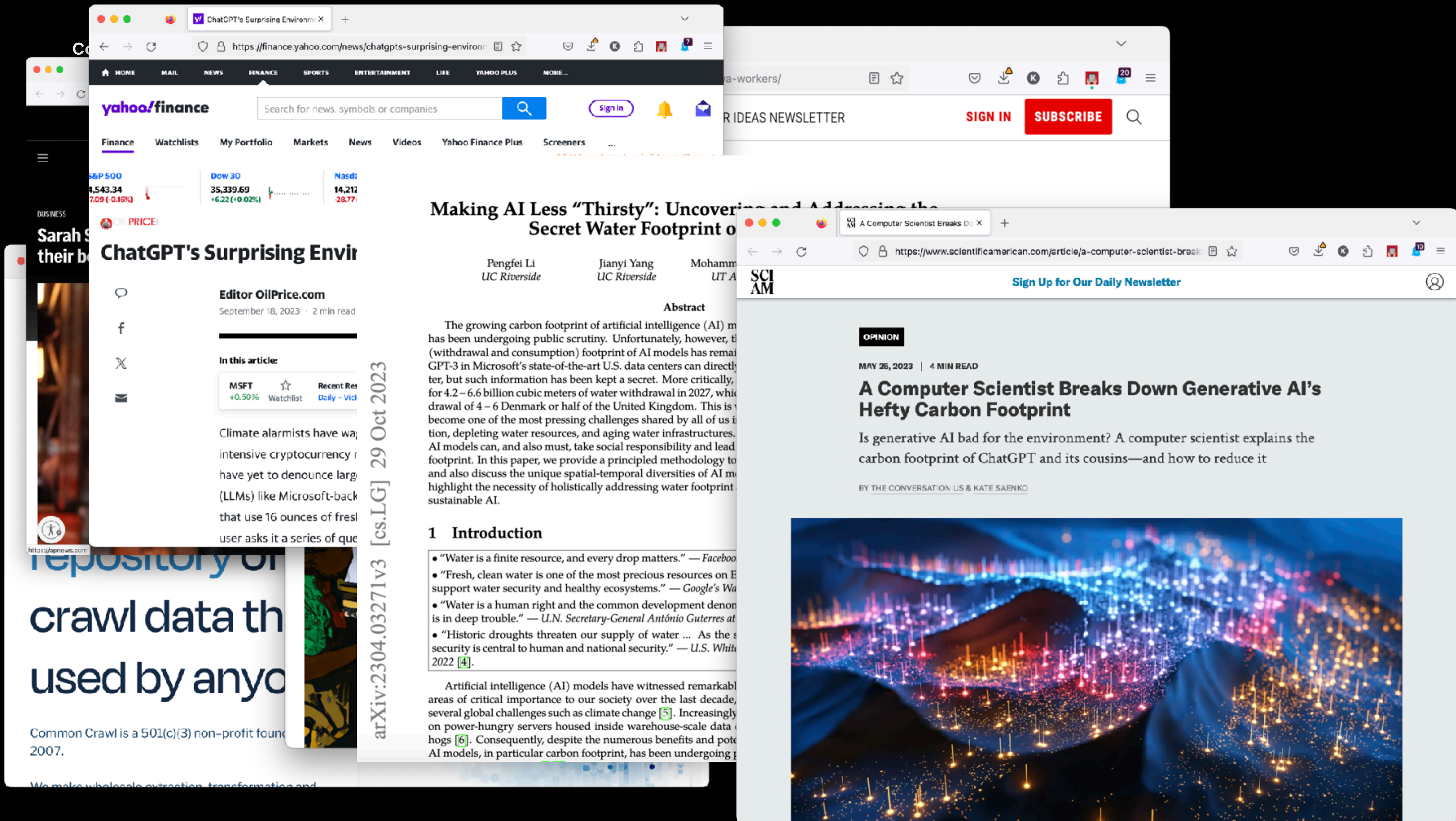
Systems



Data



Visualization



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+7.09 (+0.16%)

Dow 30

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Editor OilPrice.com

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Climate alarmists have warned that intensive cryptocurrency mining have yet to denounce large language models (LLMs) like Microsoft-backed GPT-4 that use 16 ounces of freshwater per user asks it a series of questions.

Making AI Less "Thirsty": Uncovering and Addressing the Secret Water Footprint of AI

Pengfei Li
UC Riverside

Jianyi Yang
UC Riverside

Mohammad
UT Austin

Abstract

The growing carbon footprint of artificial intelligence (AI) models has been undergoing public scrutiny. Unfortunately, however, the (withdrawal and consumption) footprint of AI models has remained a secret. More critically, GPT-3 in Microsoft's state-of-the-art U.S. data centers can directly withdraw 4.2 – 6.6 billion cubic meters of water in 2027, which is equivalent to 4 – 6 Denmark or half of the United Kingdom. This is becoming one of the most pressing challenges shared by all of us in the future, depleting water resources, and aging water infrastructures. AI models can, and also must, take social responsibility and lead a sustainable AI. In this paper, we provide a principled methodology to quantify the water footprint of AI models and also discuss the unique spatial-temporal diversities of AI models. We highlight the necessity of holistically addressing water footprint in sustainable AI.

1 Introduction

- "Water is a finite resource, and every drop matters." — Facebook
- "Fresh, clean water is one of the most precious resources on Earth to support water security and healthy ecosystems." — Google's Water
- "Water is a human right and the common development denominator is in deep trouble." — U.N. Secretary-General António Guterres at
- "Historic droughts threaten our supply of water ... As the security is central to human and national security." — U.S. White House 2022 [4].

Artificial intelligence (AI) models have witnessed remarkable areas of critical importance to our society over the last decade, several global challenges such as climate change [5]. Increasingly on power-hungry servers housed inside warehouse-scale data centers [6]. Consequently, despite the numerous benefits and potential of AI models, in particular carbon footprint, has been undergoing

https://www.scientificamerican.com/article/a-computer-scientist-breaks-down-generative-ai-carbon-footprint/

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OPINION

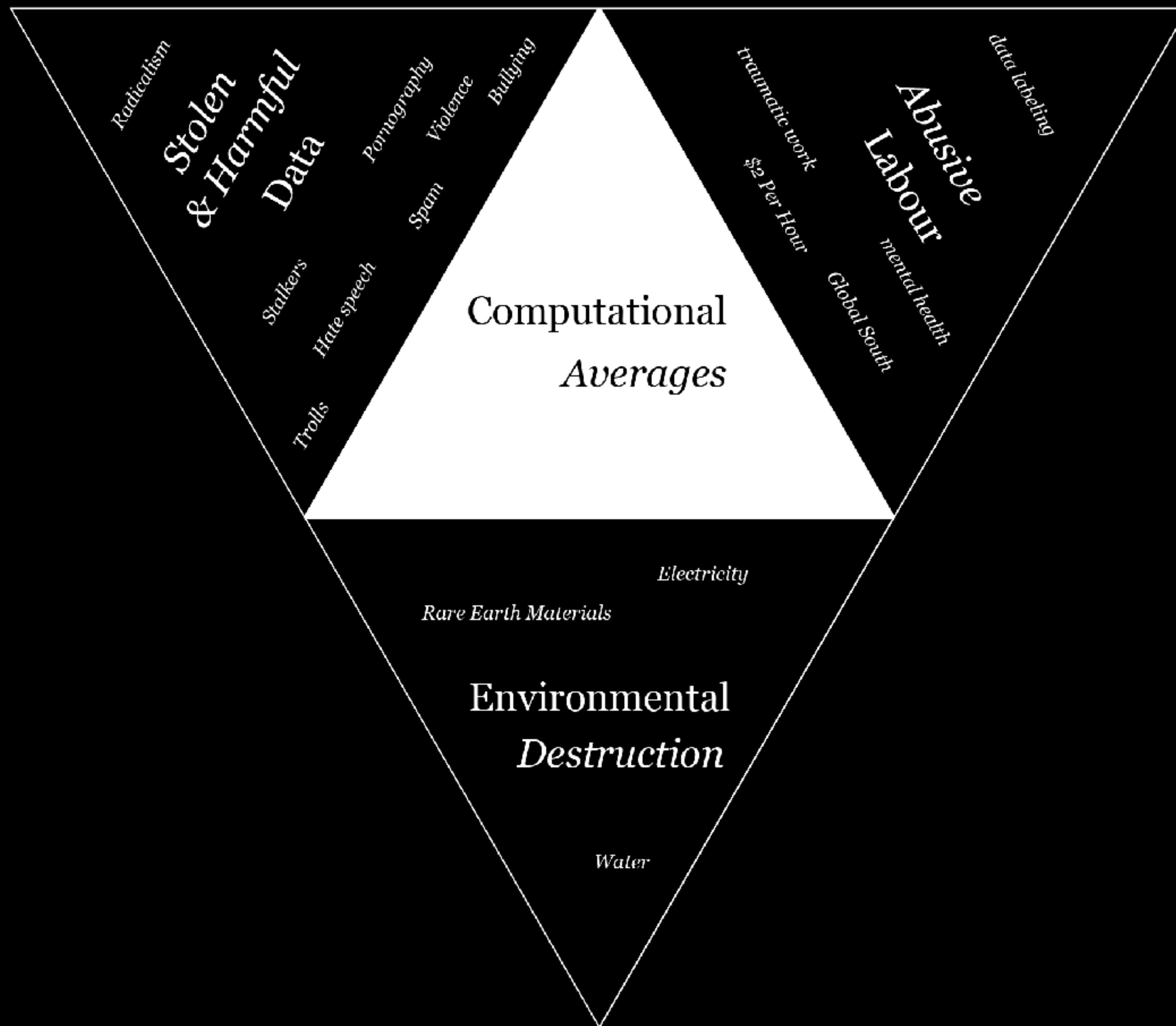
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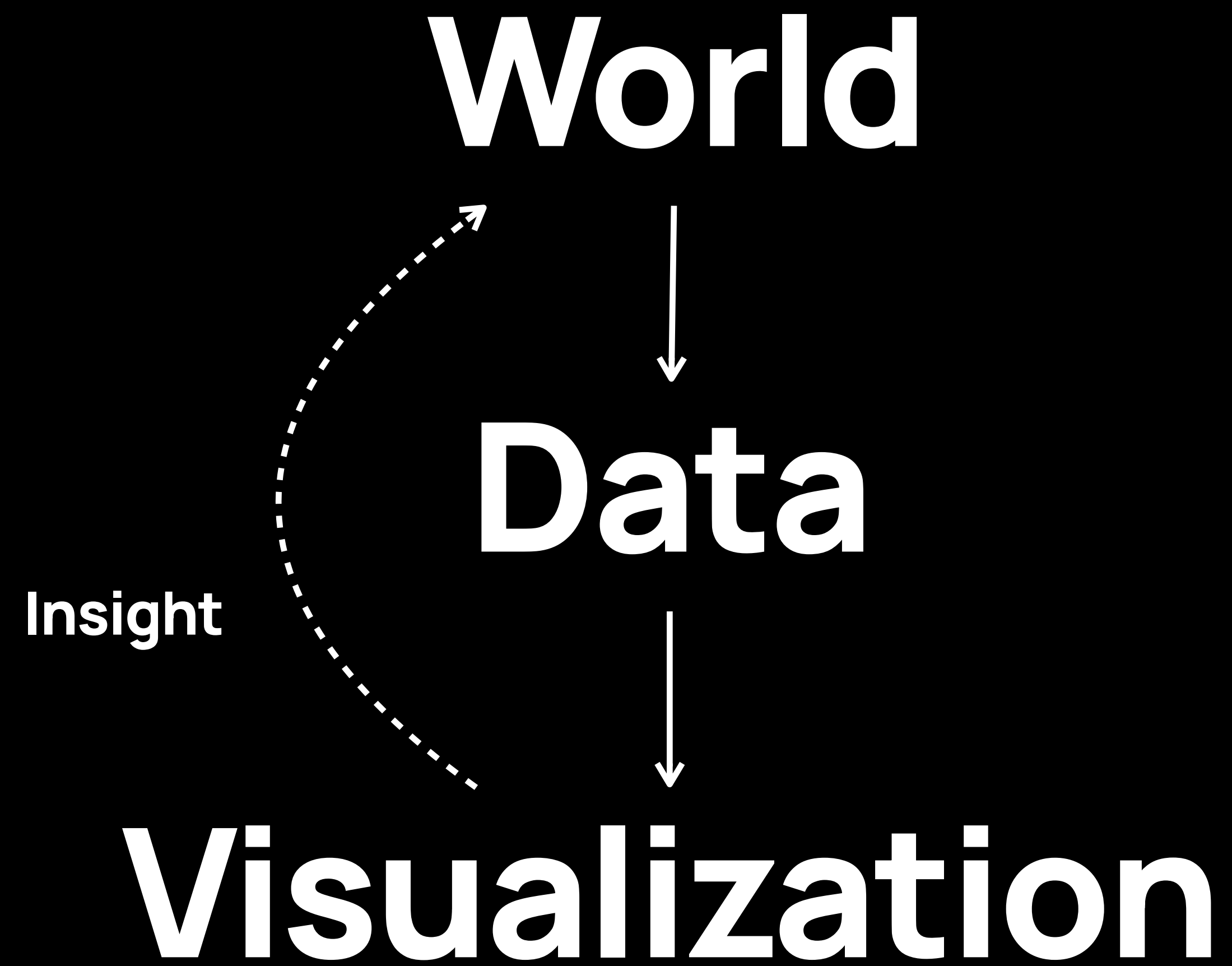
A Computer Scientist Breaks Down Generative AI's Hefty Carbon Footprint

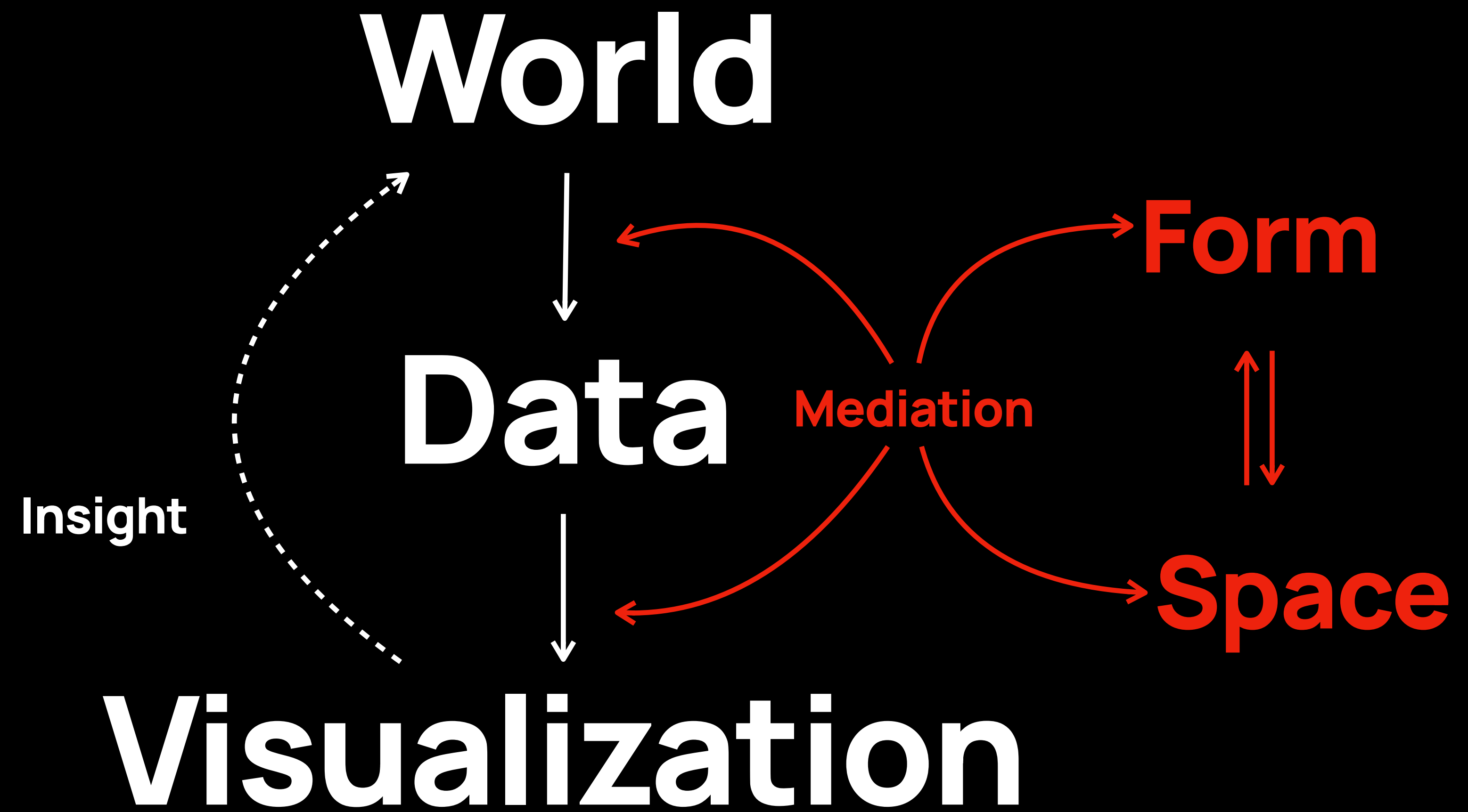
Is generative AI bad for the environment? A computer scientist explains the carbon footprint of ChatGPT and its cousins—and how to reduce it

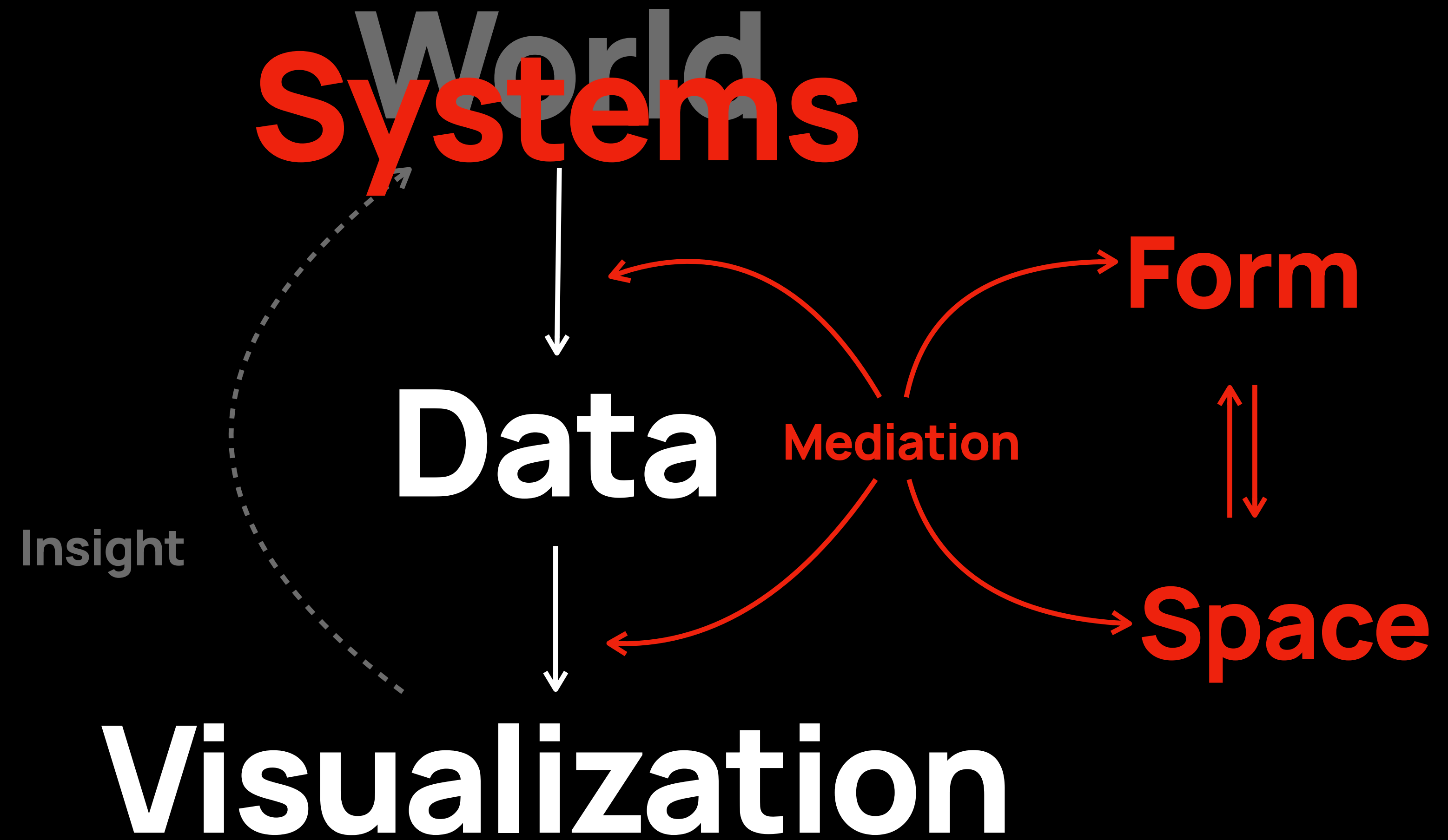
BY THE CONVERSATION US & KATE SAENKO

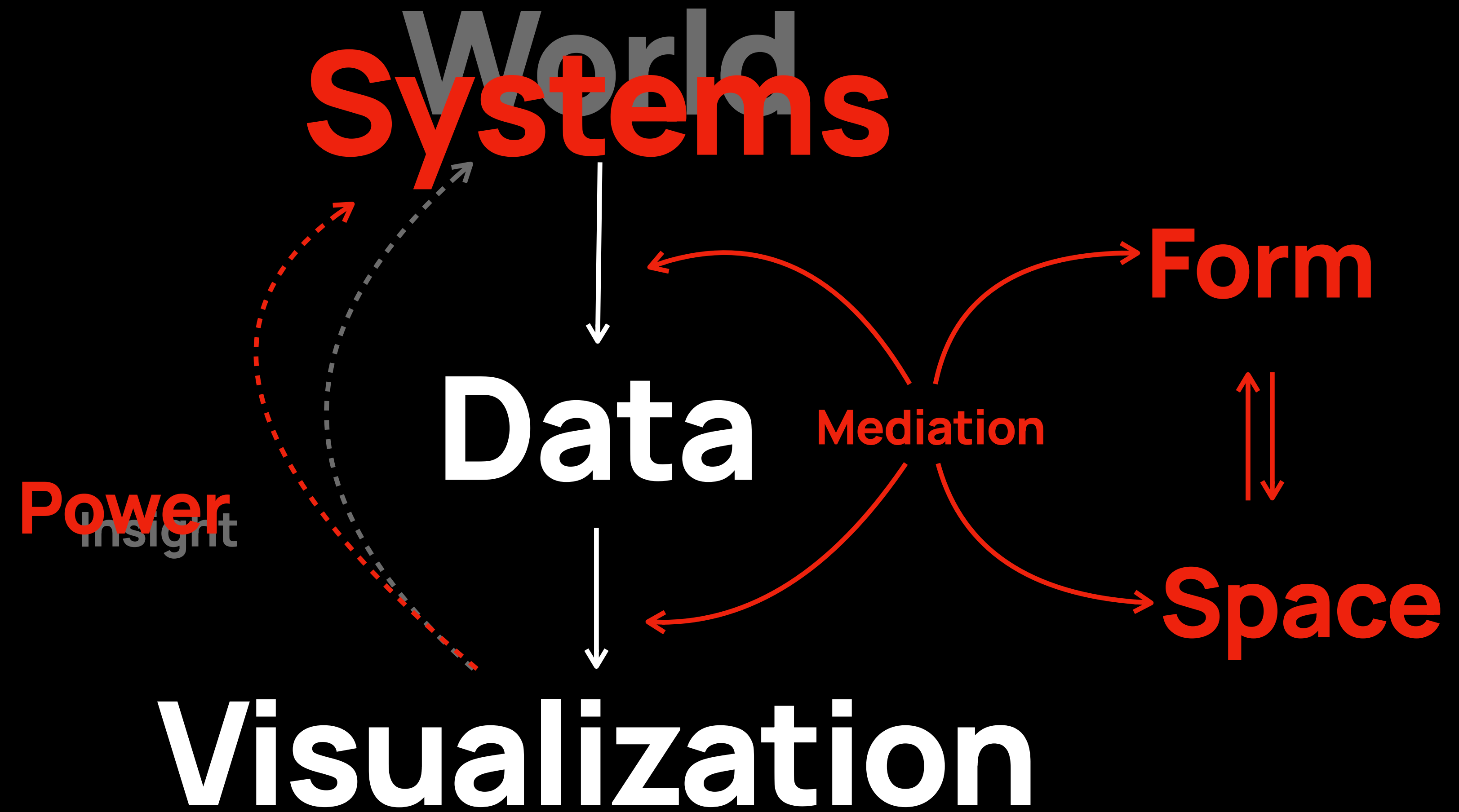




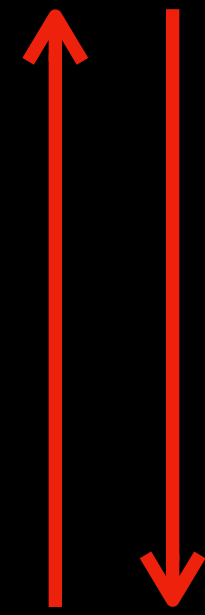








Abstraction



Reality

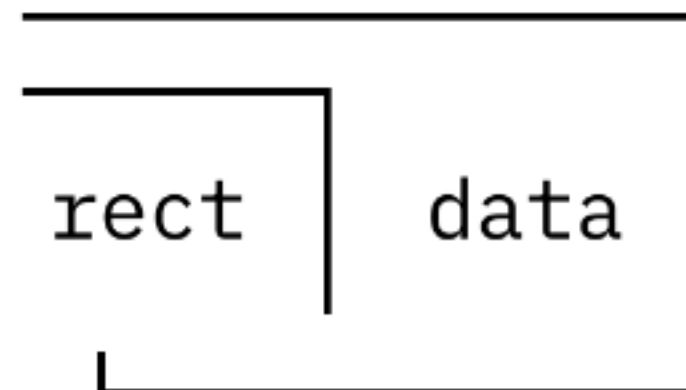
Draw a distinction.

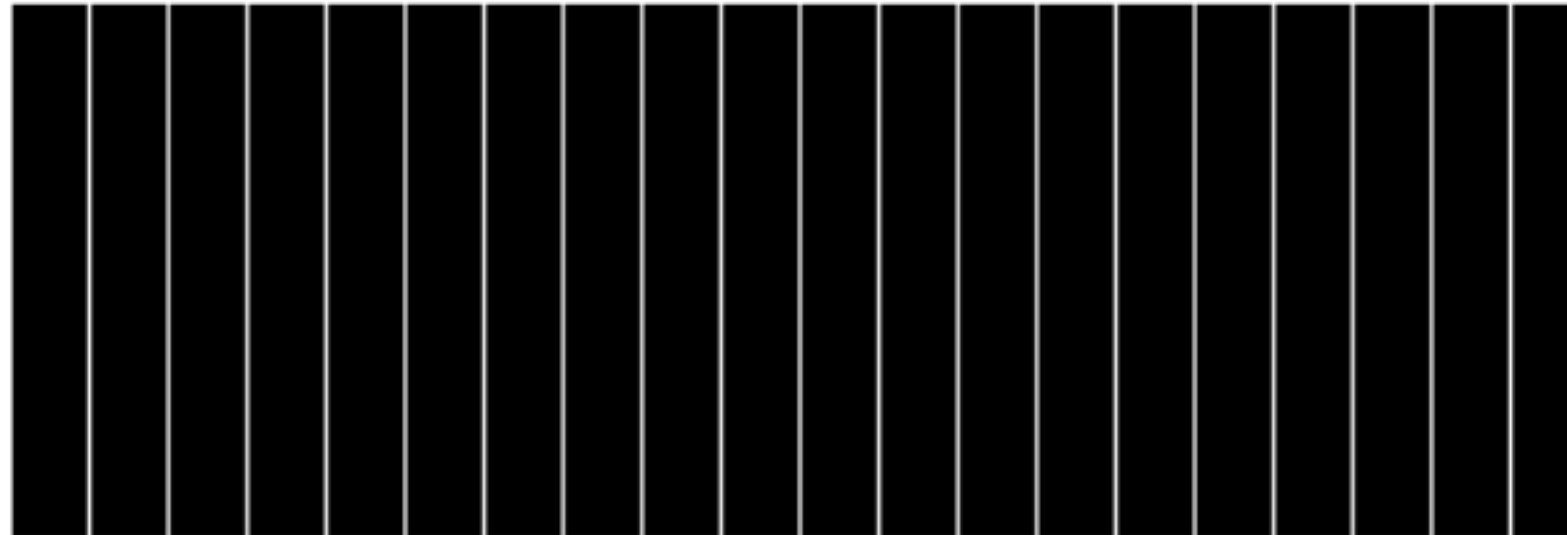




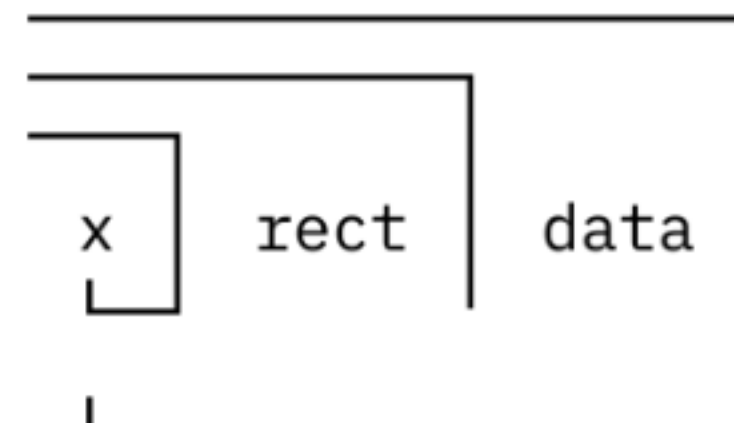


```
svg.selectAll("rect")  
  .data(dataset)  
  .enter()  
  .append("rect")  
  .attr("x", 0)  
  .attr("y", 0)  
  .attr("width", 20)  
  .attr("height", 100);
```

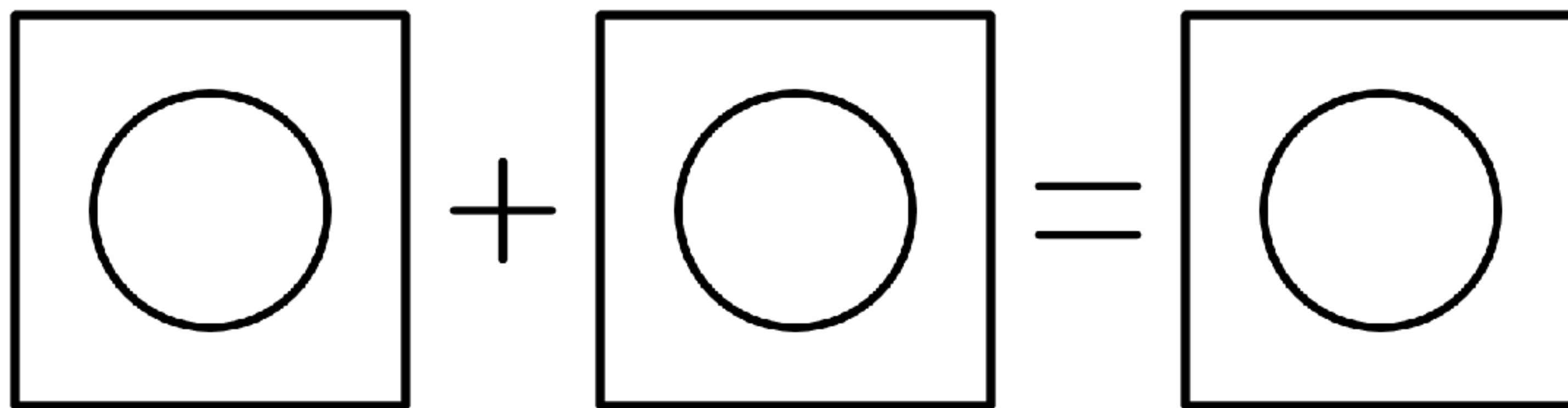




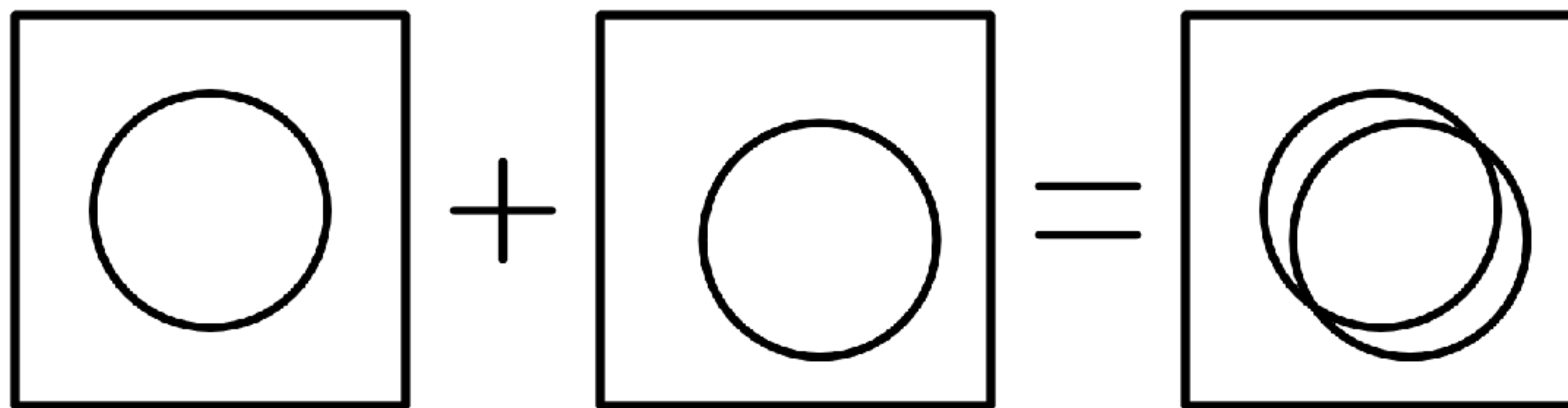
```
.attr("x", function(d, i) {  
    return i * 21;  
})
```

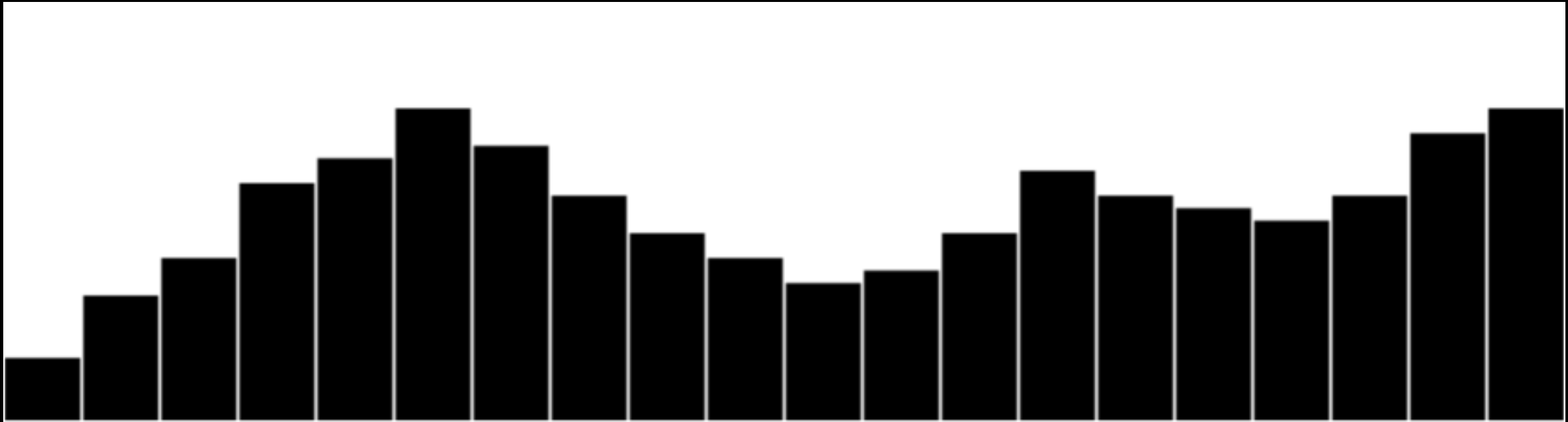


Axiom 1

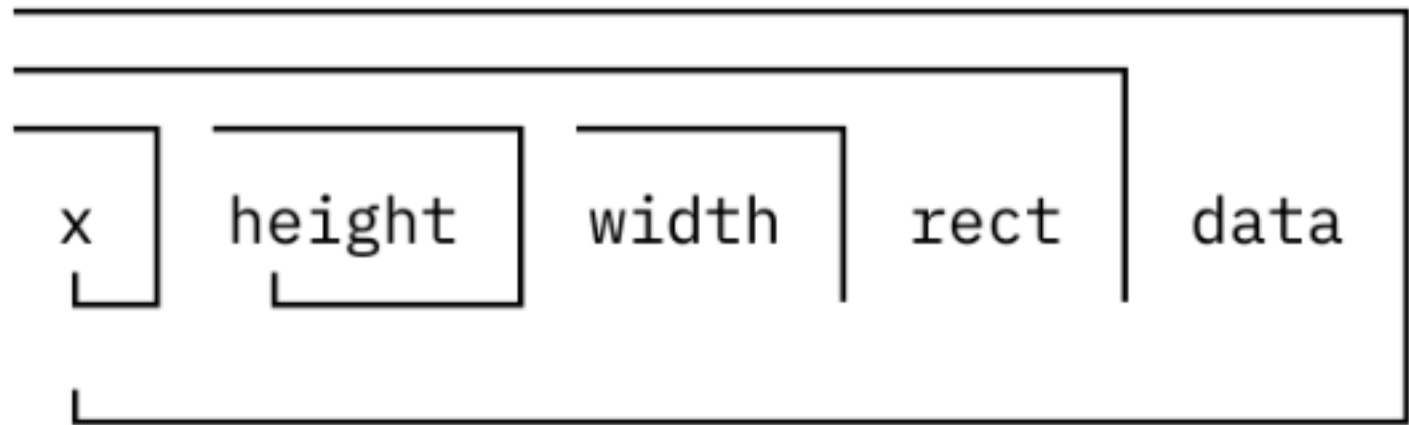


Axiom 1





```
.attr("height", function(d) {  
    return h - (d * 4);  
})
```





bar chart

This figure displays a bubble chart titled "2015" illustrating the relationship between Income per person, \$/year (GDP/capita) on the X-axis and Life expectancy, years on the Y-axis. The size of the bubbles represents Population, and the color represents the World Region.

The X-axis (Income per person, \$/year (GDP/capita)) is logarithmic, ranging from 200 to 100k. The Y-axis (Life expectancy, years) is linear, ranging from 30 to 80. The legend indicates that bubble size represents Population and color represents the World Region.

The chart shows a strong positive correlation between income per person and life expectancy. Bubbles are clustered into distinct groups, likely representing different world regions, showing that higher income generally corresponds to higher life expectancy across all regions.

Source: <https://lisacharlotterost.de/2016/05/17/one-chart-tools/>
<https://lisacharlotterost.de/2016/05/17/one-chart-code/>

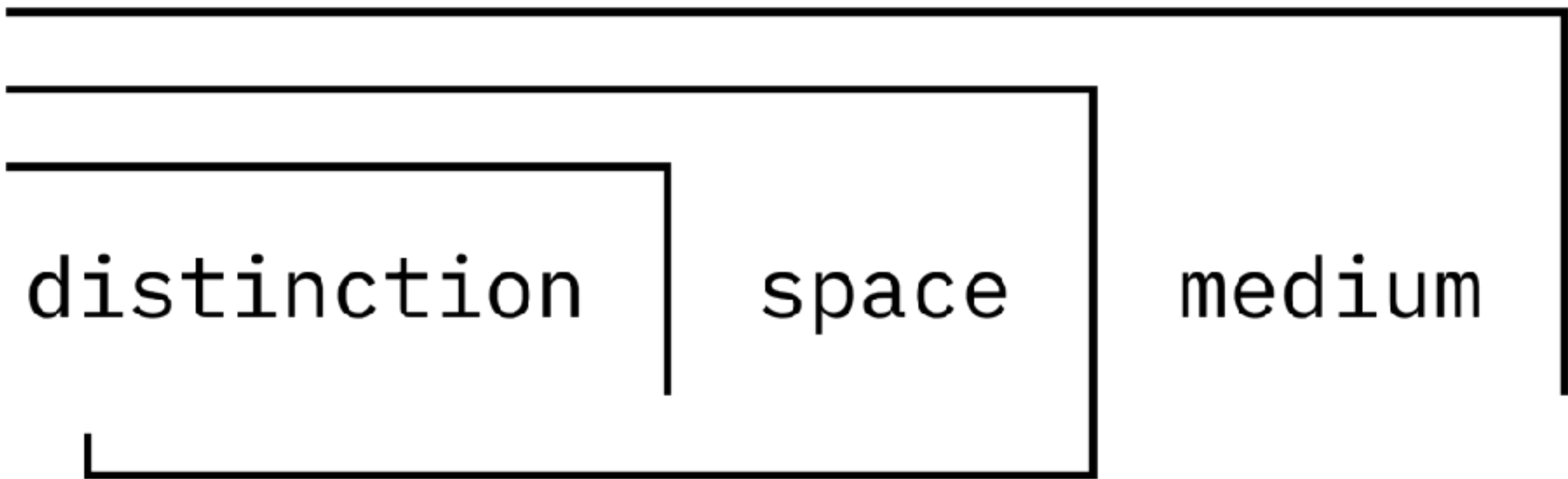
design

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distinction

space

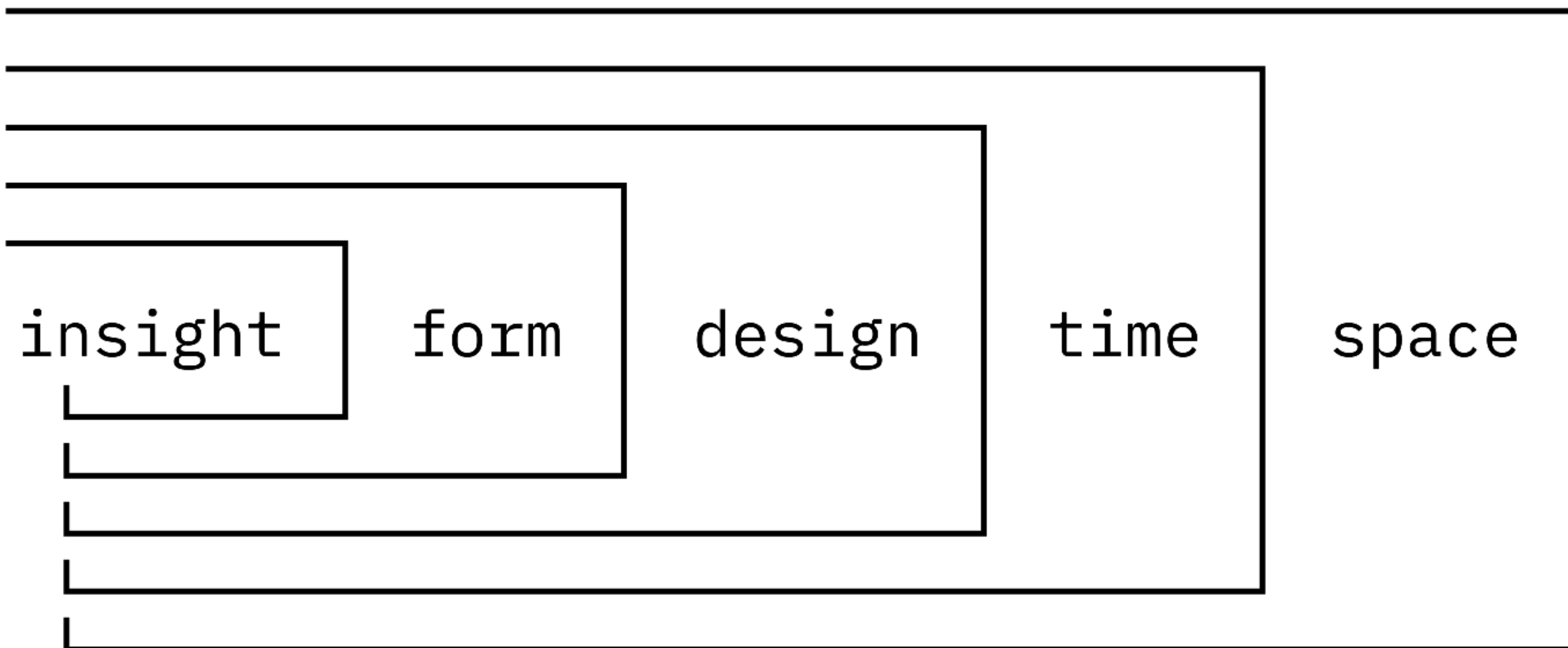
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unmarked



design

de—sign

THANK YOU

Abstraction Today: The Real and the Imaginary

Prof. Dr. Kim Albrecht,
Folkwang University of the Arts
December 16th 2025

Slides: databased.design/de/notes/abstraction-today