



Data Viz & AI

Indiana University, April
25, 2016

mmartino@us.ibm.com

Watson Research

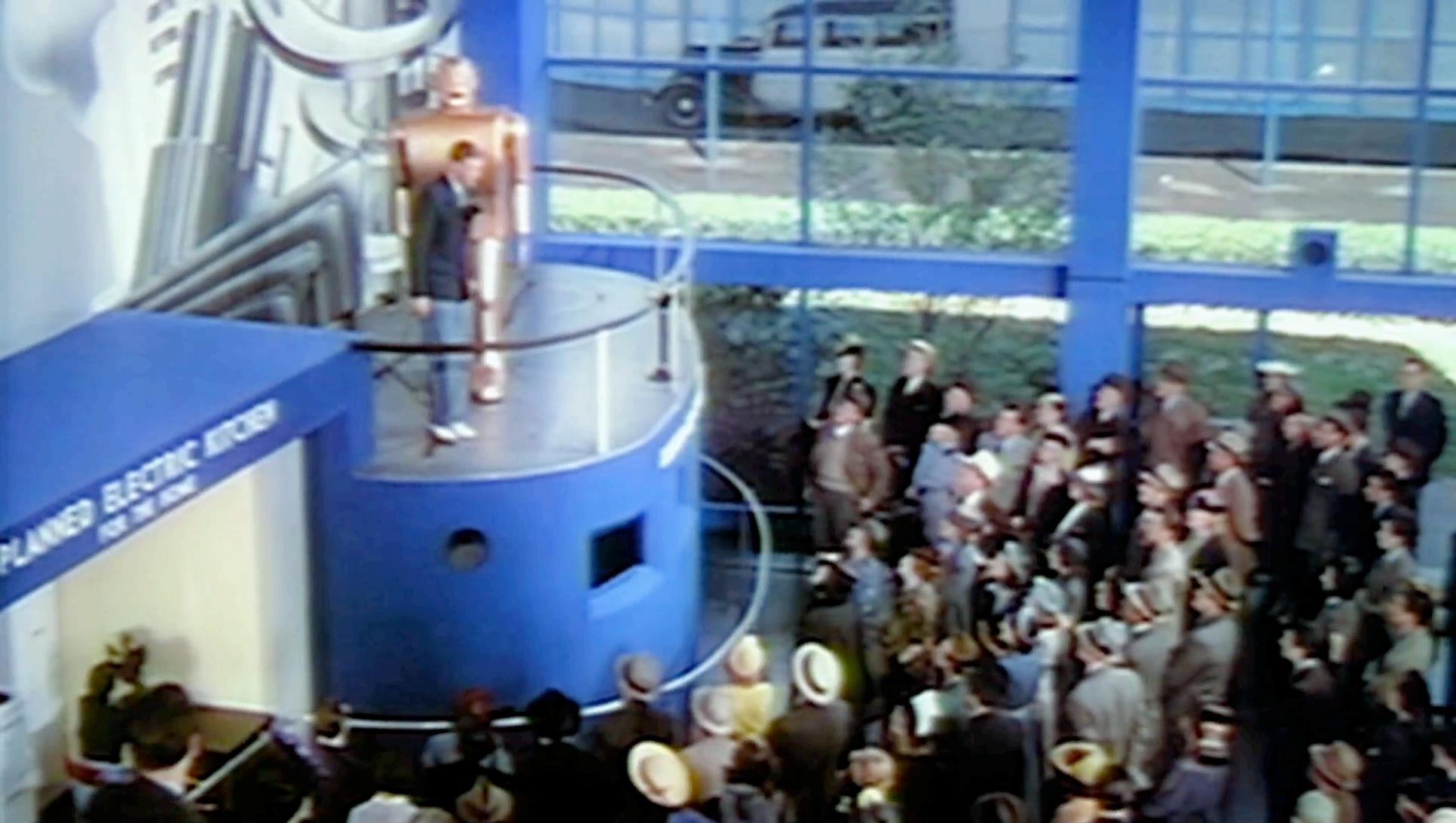
www.mamartino.com



What is AI?

Artificial intelligence (AI) is the **intelligence exhibited** by machines or software.

PLANNED ELECTRIC MOTOR
FOR THE HOME





Deep Blue beat G. Kasparov in 1997



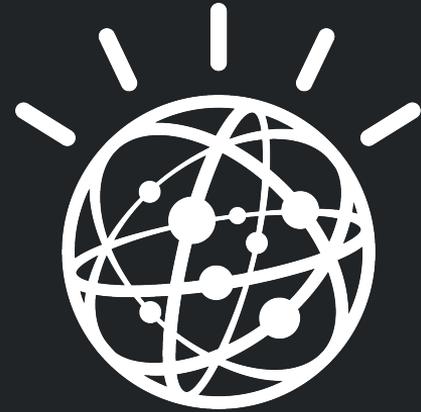


In 2011, Watson competed on Jeopardy! against former winners Brad Rutter and Ken Jennings. Watson received the first place prize of \$1 million.

Cognitive System



Next Level Data Visualization
Automation + Interactivity



User characteristics / Dataviz point of view:

Person



Visualization expert or NOT

Familiarity with statistic

Domain expert or NOT

Familiarity with graph/charts

Motivation

Cognitive style

Age/Sex

Personality

Target Groups or Customer Segments: mental model, lifestyle model, values, behavior...



PERSONA A

PERSONA B

PERSONA C

PERSONA D

PERSONA E

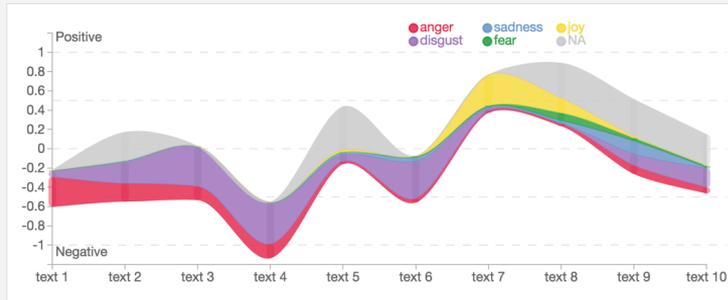
DEMO - Sentiment and Emotion

Sentiment and Emotion

Sentiment and Emotion application uses text analytics to detect sentiment and emotions from people's digital footprints (e.g., online reviews and social media text). The application can offer positive or negative sentiment and emotions of "anger", "disgust", "sadness", "fear" and "joy".

Output

This demo shows the sentiment and emotion patterns in your text sample. The y-axis indicates the level of sentiment (how positive and negative) and the color bands show the overall patterns of the emotion changes section by section in the input text (each text piece is separated by a new line). Each bar shows the composition of emotions for a specific section of text.



because I wanted to make sure they had some healthy stuff on the menu. Turns out I had NOTHING to be worried about, because 75% of the menu is healthy and delicious! I ordered the salmon with broccoli and greenbeans. Great portions :) the service was awesome too, as our waiter was very kind and gave great recommendations. Will be back again!

I wish i could give Westville East a better rating because I really liked my experience at the west village location, but

https://sentiment-and-emotion.mybluemix.net/?cm_mc_uid=25712808471514615714314&cm_mc_sid_50200000=1461571431

Sentiment and Emotion application uses text analytics to detect sentiment and emotions from people's digital footprints (e.g., online reviews and social media text). The application can offer positive or negative sentiment and emotions of "anger", "disgust", "sadness", "fear" and "joy".

DEMO - Tone Analyzer

Tones

Emotion

Anger

Disgust

Fear

Joy

Sadness

Language

Analytical

Confident

Tentative

Social

Openness

Conscientiousness

Extraversion

Agreeableness

Emotional Range

Original Text Sentence Rank JSON

None Strong

Agent: Oh okay.

Agent: Sorry about that.

Customer: I need you to delete this fake account because it is not mine.

Customer: Please don't change my password.

Agent: Ah okay, yeah sure.

Agent: I'm not going to change your password ma'am.

Customer: Ma'am?

Customer: What is going on here?

Agent: Oh so sorry to call you Ma'am.

Agent: It's okay.

Agent: I got misinformation in here, but let me handle this for you.

Customer: Can you delete the fake account or not?

Agent: Okay.

Agent: Please give me another moment again.

Agent: Okay?

In `sentences_tone`, each `sentence_id` receives a `raw_score` for each tone in a category. Understand how to normalize raw scores or customize thresholds for your use case in the [Documentation](#).

<https://tone-analyzer-demo.mybluemix.net/>

This service enables people to discover and understand, and revise the impact of tone in their content. It uses linguistic analysis to detect and interpret emotional, social, and language cues found in text.

DEMO - Audio Analysis

Audio Analysis

< Try another video



Maps & Macroscopes -- Gaining Insights from BIG Data: Katy Borner at TEDxBloomington

Recommendations

Generated from concepts with the highest confidence scores

 <p>Why we should trust scientists Naomi Oreskes</p>	 <p>The quest to understand consciousness Antonio Damasio</p>				
Globe	Experience	Observation	Topography	Information	Image

Timeline

High confidence Middle confidence Low confidence

- Sin**
3m 56s
...students lost three hundred DP I many of sin by the way are online..
- Student**
3m 55s
...seal real maps out of twenty four by students lost three hundred DP I many of sin ..
- Man**

also facing.. %HESITATION.. However not all of us bus.. Designed to deal with this flood of data be optimized to make local bait daily to see.. Yes Sir Ave important long term decisions that we have to make in our life.. Such as what to study but dropped to take.. Whom to marry and how to devote our resources.. Time.. Passion.. Fortunately San out toolkits said help us make sense of massive amounts of data said help us render this data into maps into visualizations that not only experts but also.. General audiences can understand.. And colleagues of mine and I we have been creating and curating see places and spaces mapping science exhibit opposite last

https://audio-analysis-application-starter-kit.mybluemix.net/?cm_mc_uid=25712808471514615714314&cm_mc_sid_50200000=1461571431

<https://www.youtube.com/watch?v=kObBOCpVa8s>

DEMO - Sentiment and Emotion



Text to Speech

The Text to Speech service understands text and natural language to generate synthesized audio output complete with appropriate cadence and intonation. It is available in 13 voices across 7 languages. Select voices now offer [Expressive Synthesis](#).

Resources:

[API Reference](#) [Documentation](#) [Fork and Deploy on Bluemix](#) [Fork on Github](#)

<https://text-to-speech-demo.mybluemix.net/>

Input Text

The text language must match the selected voice language: Mixing language (English text with a Spanish male voice) does not produce valid results. The synthesized audio is streamed to the client as it is being produced, using the HTTP chunked encoding. The audio is returned in the Ogg Opus format which can be played using [VLC](#) and Audacity players.

Would you like to help make this service better?

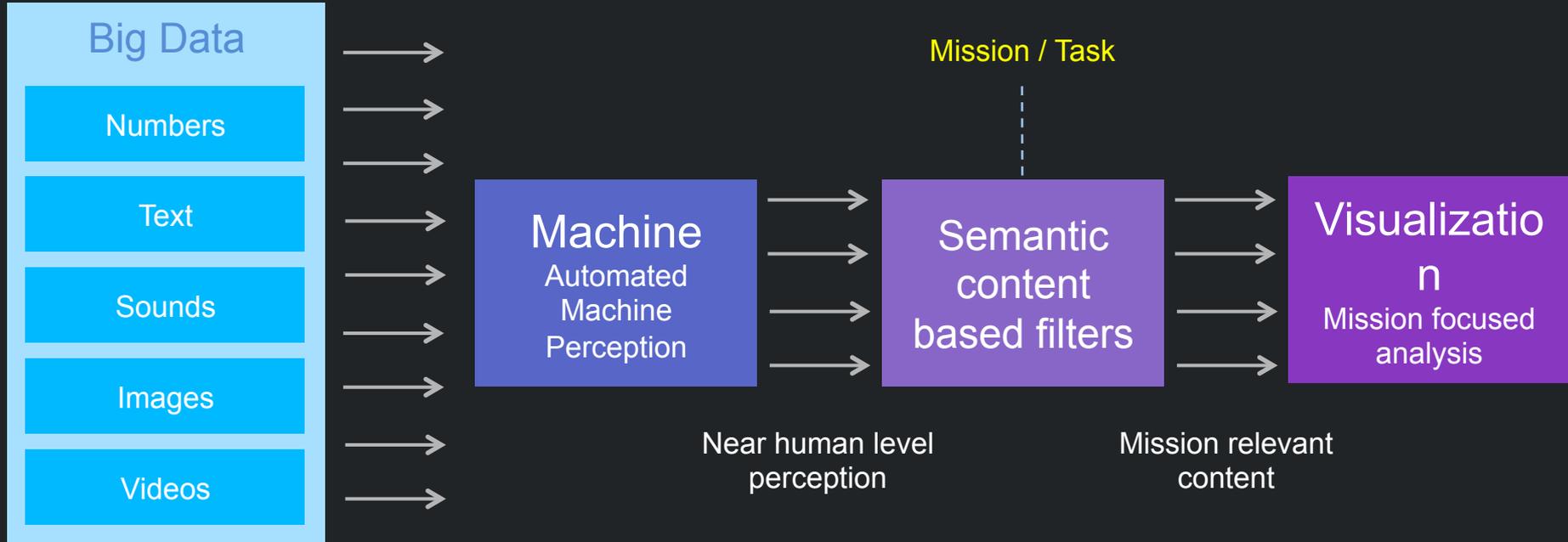
- Allow Watson to learn from this session
- Opt out

American English (en-US): Allison (female, expressive) ▾

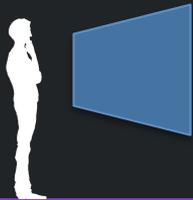
American English (en-US): Allison (female, expressive)
American English (en-US): Michael (male)
American English (en-US): Lisa (female)
British English (en-GB): Kate (female)
French (fr-FR): Renee (female)
German (de-DE): Birgit (female)
German (de-DE): Dieter (male)
Italian (it-IT): Francesca (female)
Japanese (ja-JP): Emi (female)
Brazilian Portuguese (pt-BR): Isabela (female)
Castilian Spanish (es-ES): Enrique (male)
Castilian Spanish (es-ES): Laura (female)
North American Spanish (es-US): Sofia (female)

I am sorry to inform you that the items you requested are back-
now when those items will become available. Maybe next week but
a happy customer, management has decided to give you a 50%

From Data to Visualization:

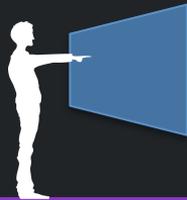


Evaluate the User Engagement in front the data visualization:



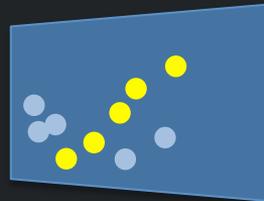
Expose
Viewing

The user knows how to read data points.



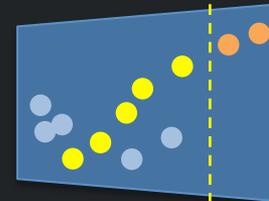
Involve
Interacting

The user interacts with the visualization and manipulate the data.



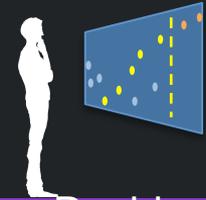
Analyze
Finding Trends

The user analyze the data, finds trends, and outliers, etc.



Synthesize
Testing Hypotheses

The user is able to form and evaluate hypotheses.



Decide
Deriving Decisions

The user is able to draw final decisions based on evaluations of different hypotheses.

BATCH COMPLETION: 08:12:51:58

ENDING: 28/05/2012

WAR ID:37887

On 271000ZMAR08, TF Kodiak (RCP 7) was directed by the ANA to a suspected IED site at coordinates WC 9318 0647, approximately 12.89 km N of FOB SALERNO. The IED consisted of a battery pack and a Pakistan mine. EOD conducted a controlled detonation on site and RCP7 continued mission.-----Summary from duplicate reportAt 26 1645Z Mar 08, Sabari ANP reported they were securing a possible IED on Route Torch, North of the Kholbesat Bazaar. On 27 Mar 08, RCP stopped at the Sabari DC to gather an escort to the IED site and moved to that location. ANP pointed out to us the location in the road they saw the wire. The RG-31 w/ arm moved forward to begin interrogation and found the wire at WC 93231 06603. EOD was called forth with their robot and a thorough investigation of the site was begun. EOD found a command pull wire that ran toward the East side of the road and ran into a culvert that ran under the road. They were able to secure the main charge (Pakistani P3 Mk1 plastic AT mine), 5L bottle of fuel, battery pack and command pull line. EOD destroyed the main charge off to the side of the road and we continued mission. IED consisted of 1 x Pakistani P3 Mk1 plastic AT mine, battery pack consisting of at least 6 x D or C cell batteries, 1 x 5L bottle of fuel and command pull wire. Insurgents used a culvert to conceal the IED and used command pull as the initiation device. ANP were able to thwart their plans in detonating this IED. NCTR EVENT CLOSEDEnd of summary from duplicate

Endless War - YoHa with Matthew Fuller (2012)

ENDLESS WAR



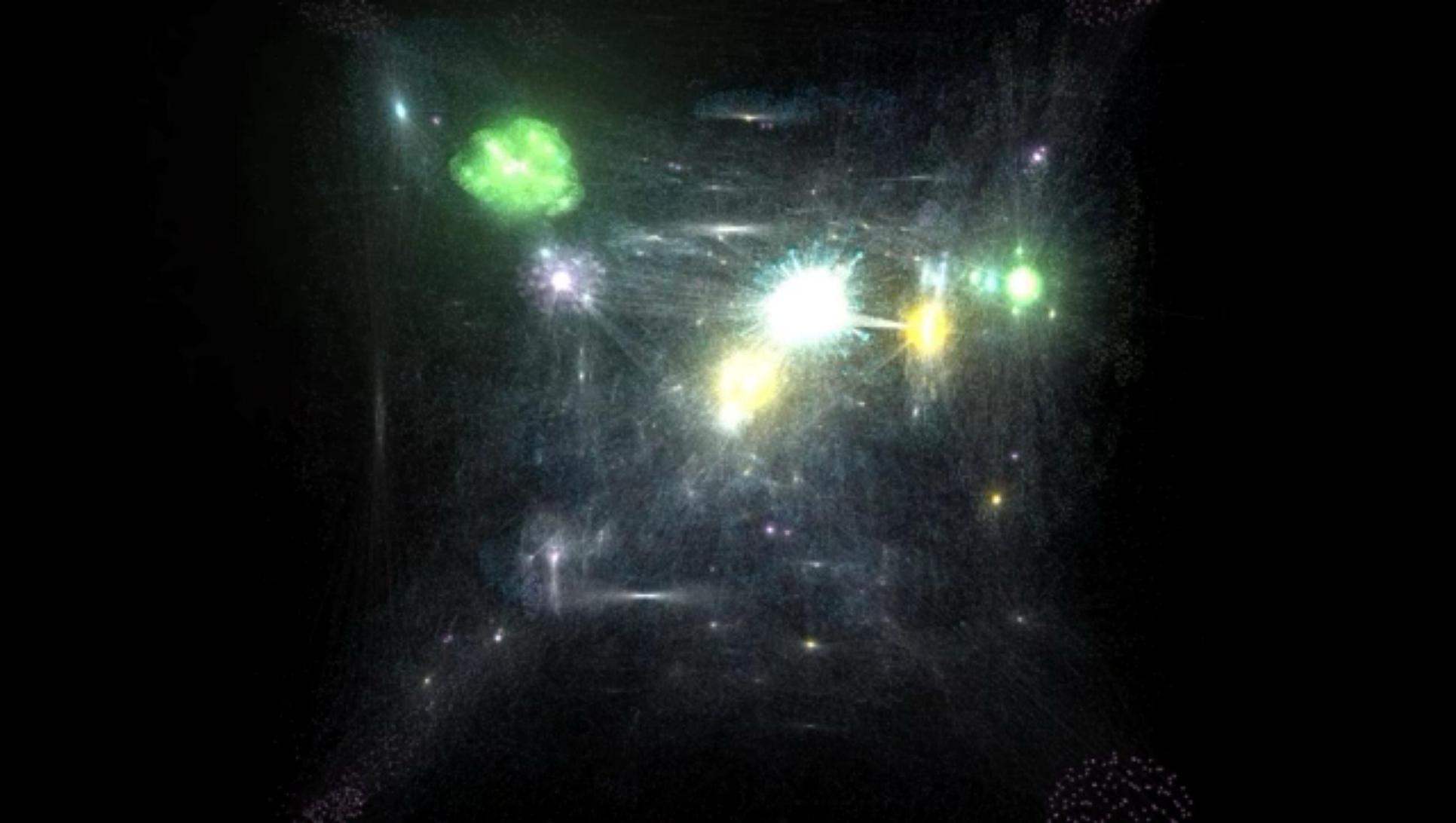
What is DataViz?

Data visualization is both an **art** and a **science**.



Unexpected
but
evocative.

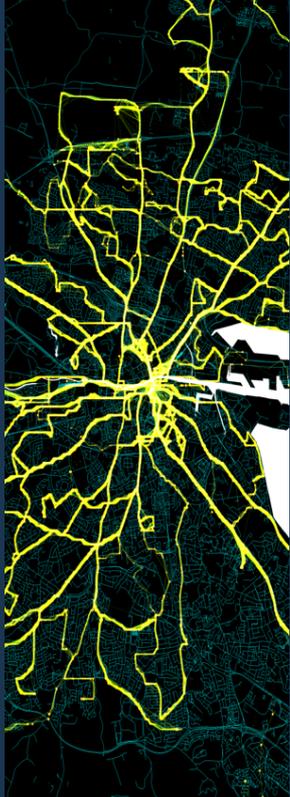
Scientific but
visually
pleasant.



IBM

TRANSPORT

New city new life...
Dublin bus



IBM

ENERGY

Monitor Energy Consumed



IBM

URBAN DYNAMICS

Quantify Mobility Demand



Smart
City

The city is emitting large volumes of diverse data

- Volume

- Bus gps (1000 buses)
- Loop (4000 sensors)

- Variety

- Counts vs mobile
- Sensor vs video vs test
- Different spatial resolution

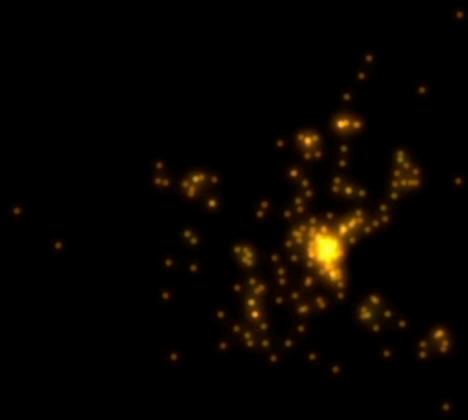
Data is continuously changing

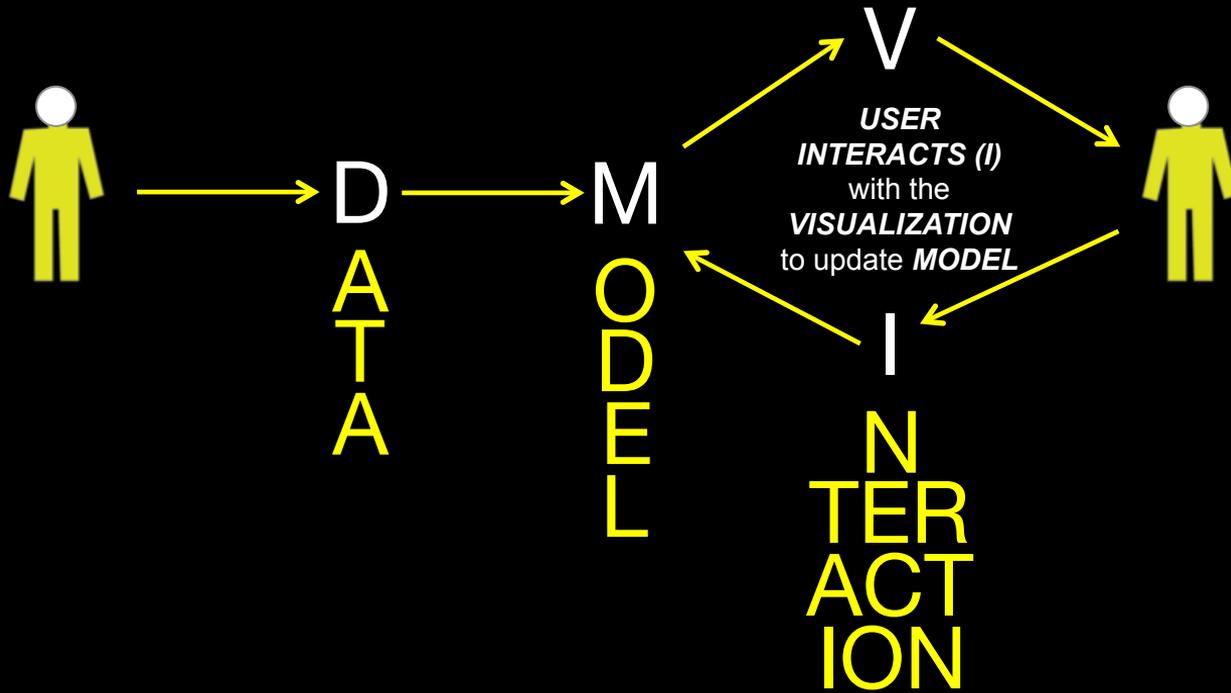
- Velocity

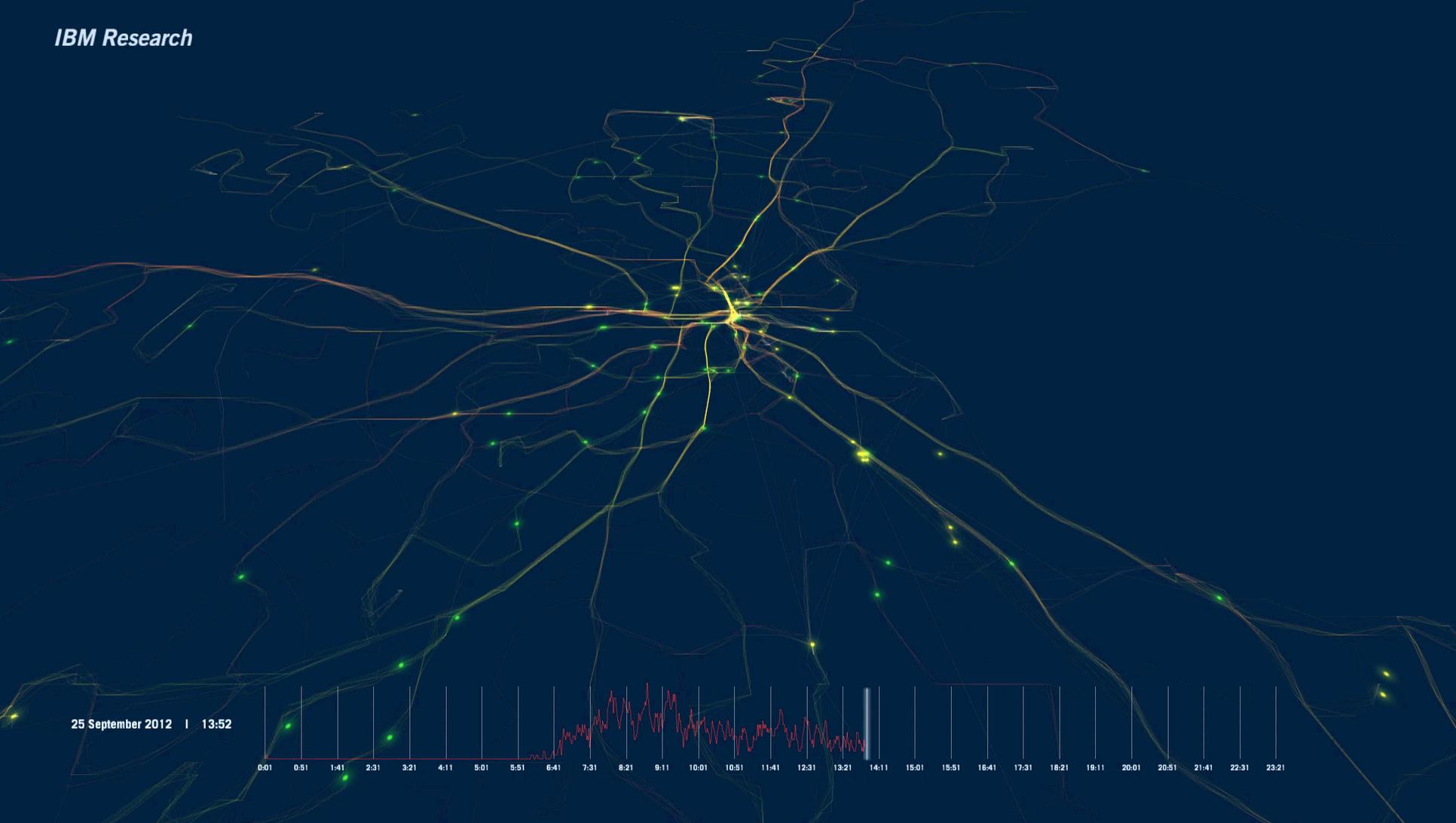
- Bus gps (3000 meas/min)
- Loop (20000 meas/min)

Smart
City

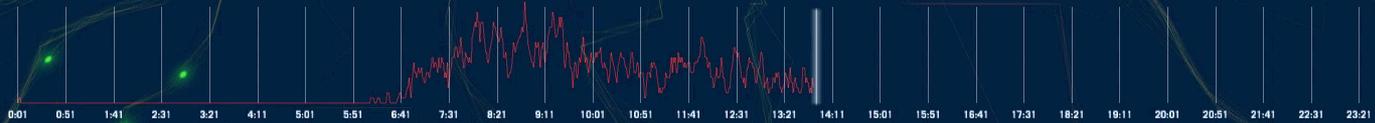
Dublin, IBM







25 September 2012 | 13:52





unstructured data

News Explorer

<http://news-explorer.mybluemix.net/>

owners approve ads for uniform jerseys
Microsoft sues feds over secrecy orders on customer data

Microsoft sues US over secret demands

New York Post endorses Donald Trump Engineer accused of illegally he

NBA to begin selling jersey sponsorships in 2017-18

Manziel escapes frightening car crash on Sunset Strip China pulls license of prominent rights lawyer Australia premier praises China ties, skirts touchy subjects

With Curry as foundation, Bob Myers built an NBA juggernaut The New York

New York Post endorses Donald Trump, calls him 'an imperfect messenger

US defense chief visits aircraft carrier in South China Sea Hillary Clin

China 2nd ranking general visits disputed islands Microsoft sues gove

China to Prosecut

Microsoft suit is latest tech clash with US over privacy

China issues ti

China issues ti

Clinton on Fracking and Energy Suspect in Ohio officer's killing passes on initial hearing Taiwan seeking to prevent suspects being deported to China Salem police looking for suspect who shot at o

ve updates on Democratic debate in Brooklyn Charles S. Hirsch, New York's chief medical examiner on 9/11, dies at 79

Latest: Aggravated murder count filed in officer's death Microsoft sues US over orders barring it from revealing surveillance

Warriors fa

his Week on Washington Week A glance at China's latest economic numbers

China blasts new US-Philippine military cooperation China blasts US human rights in tit-for-tat

00 articles across 4 days, 0 hours, 0 min

unstructured data

Video Explorer

<http://watson.ted.com/>



Ask Watson a question

Ask Watson a question to see if anyone has tried to answer it in their TED Talks.

   Type your question Ask Watson

Suggested format: How does money relate to happiness?

How does Watson do it?

Watson uses its understanding of human language to comprehend all of the TED talks. It then identifies sections that may address your question or talks that contain concepts that you may find interesting based on your own writing and personality.



WE WANT YOUR FEEDBACK

IBM Watson™

Exhibition

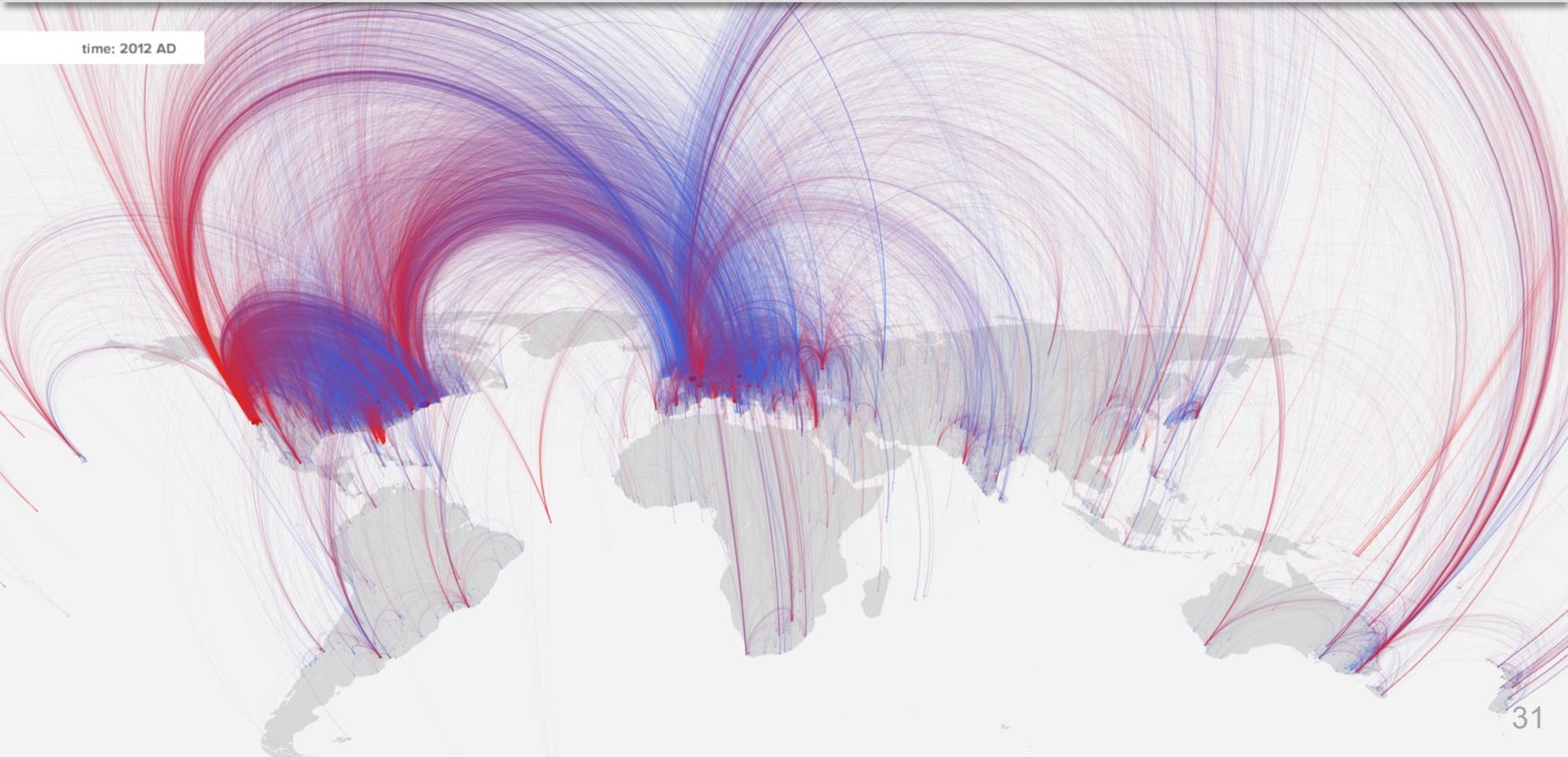
Charting Culture

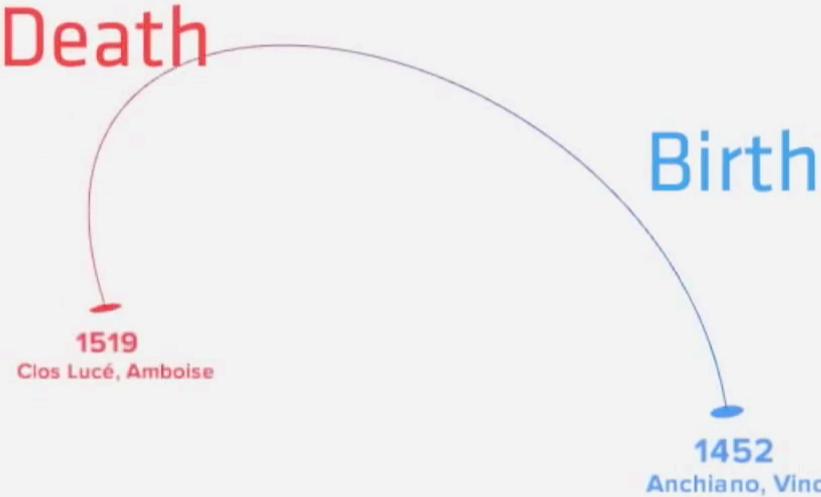
<http://www.nature.com/news/1.15650>

Storytelling

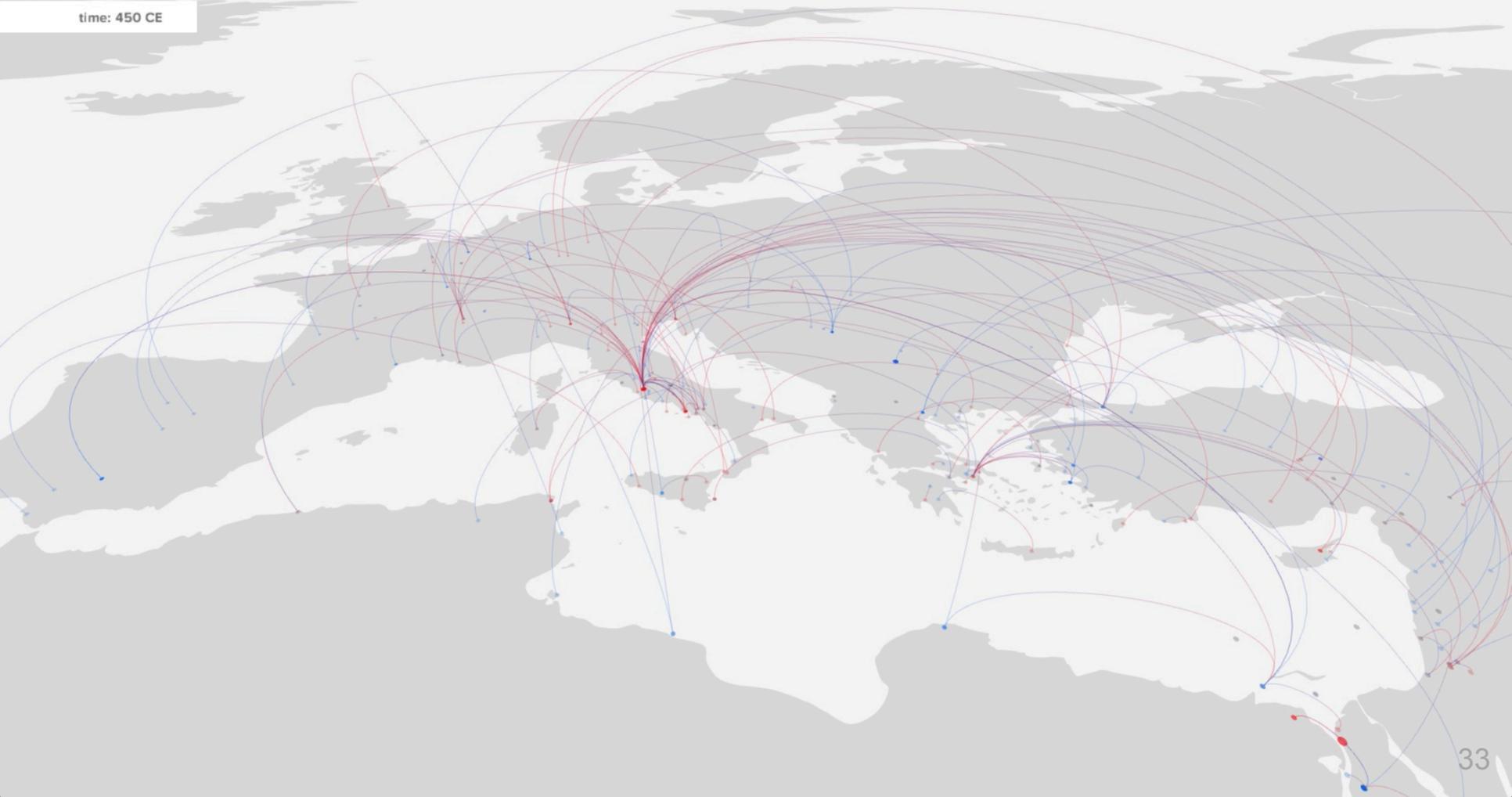
How to Be Persuasive

time: 2012 AD

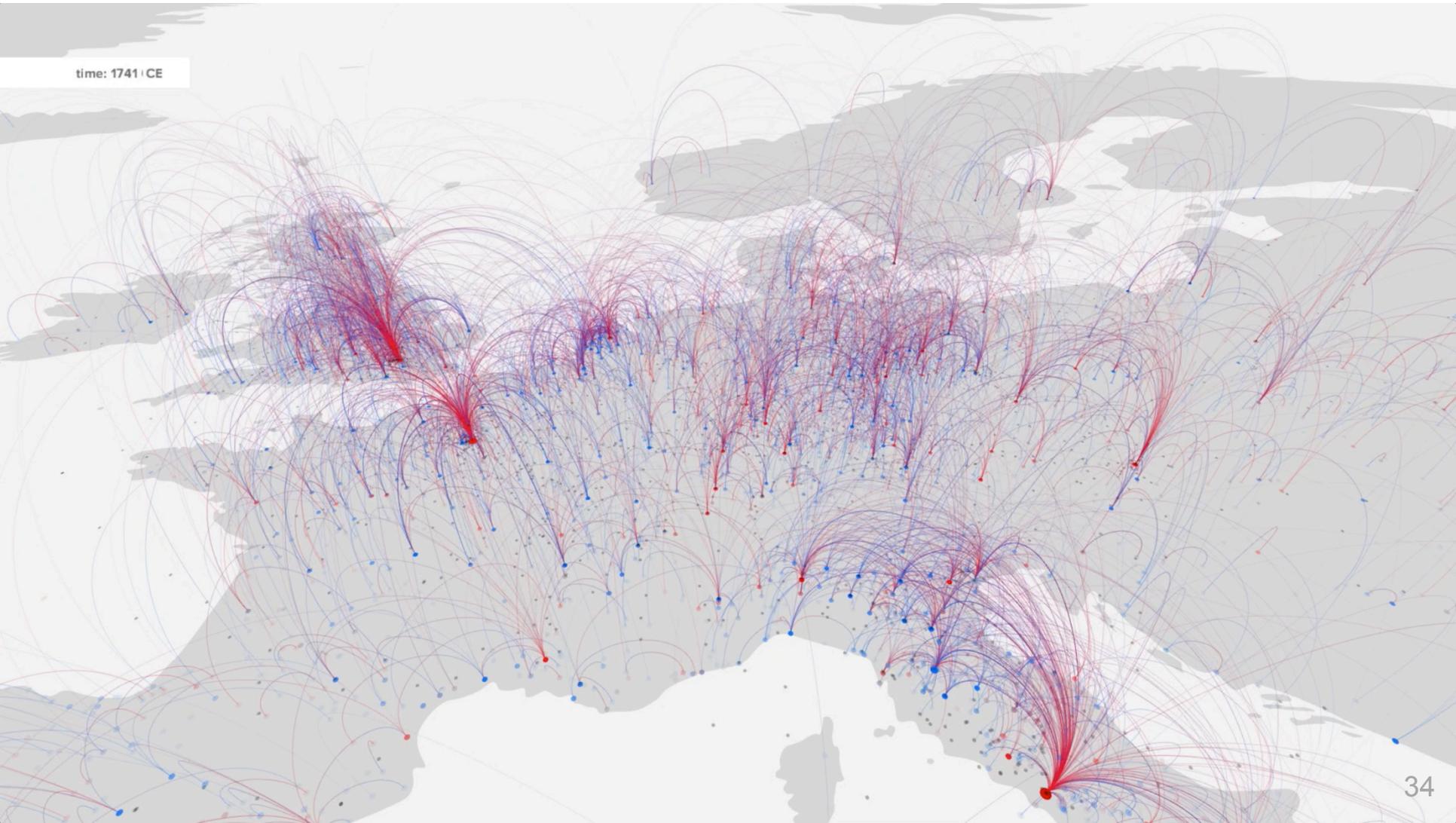




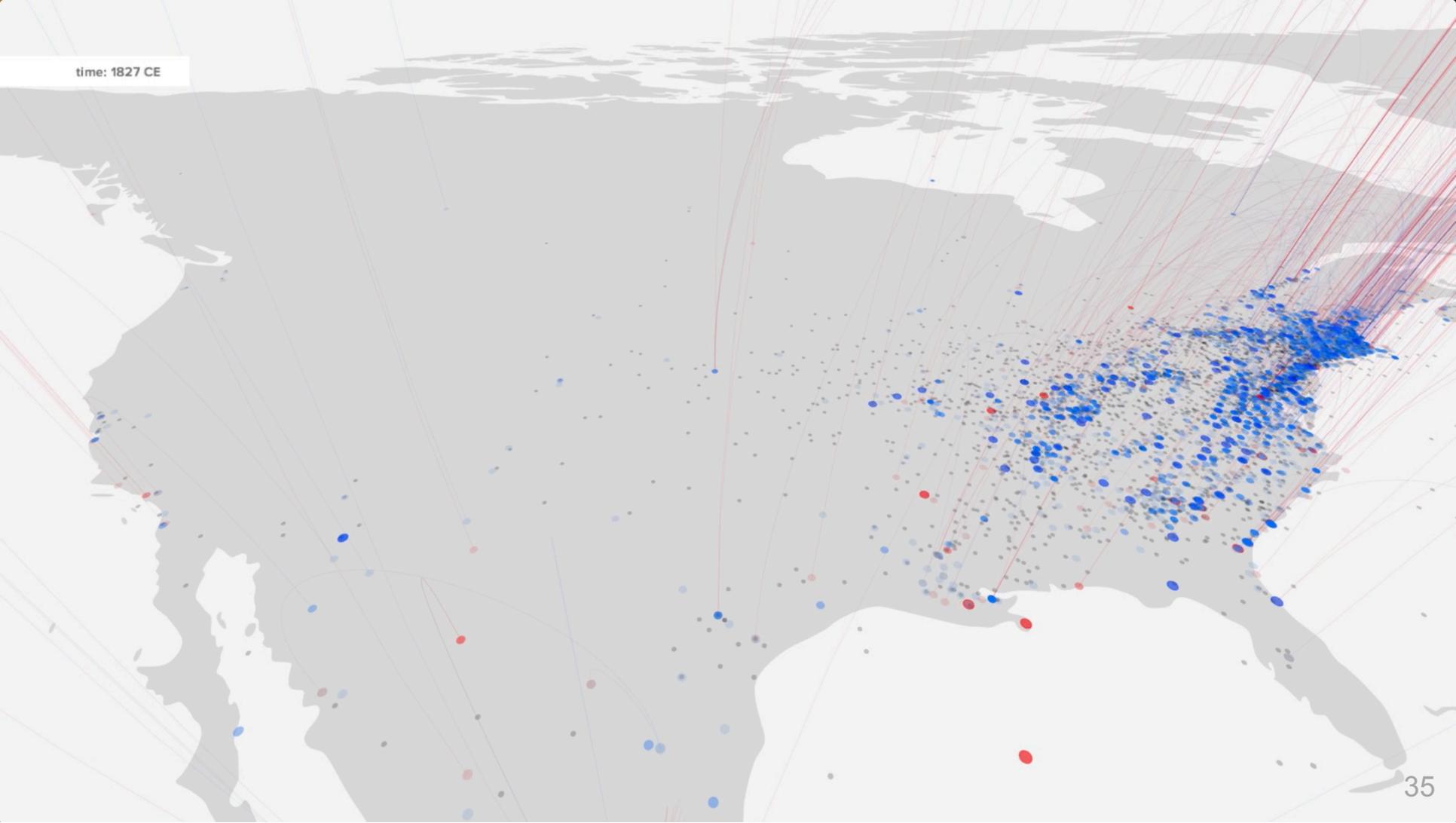
time: 450 CE



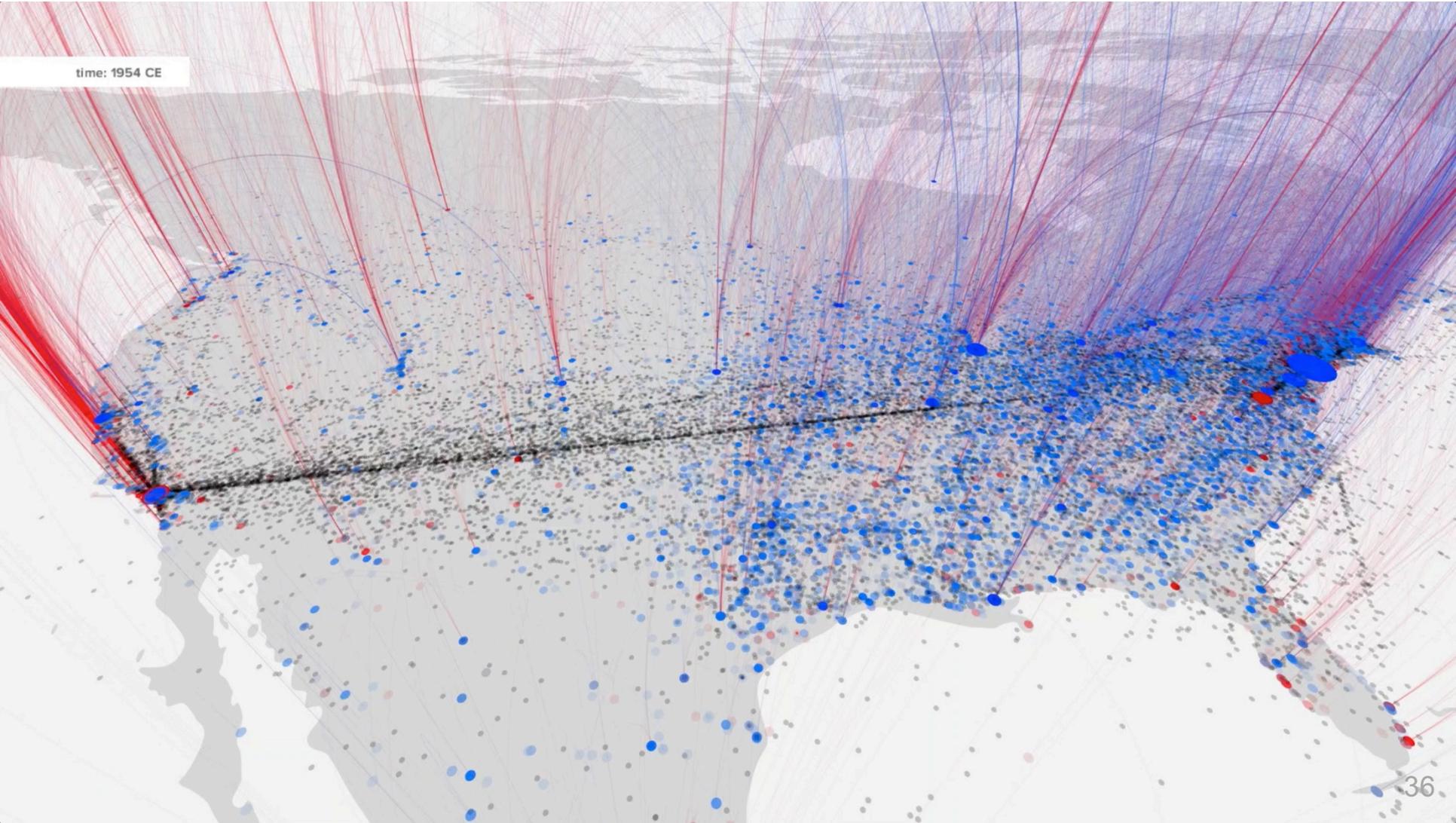
time: 1741 | CE



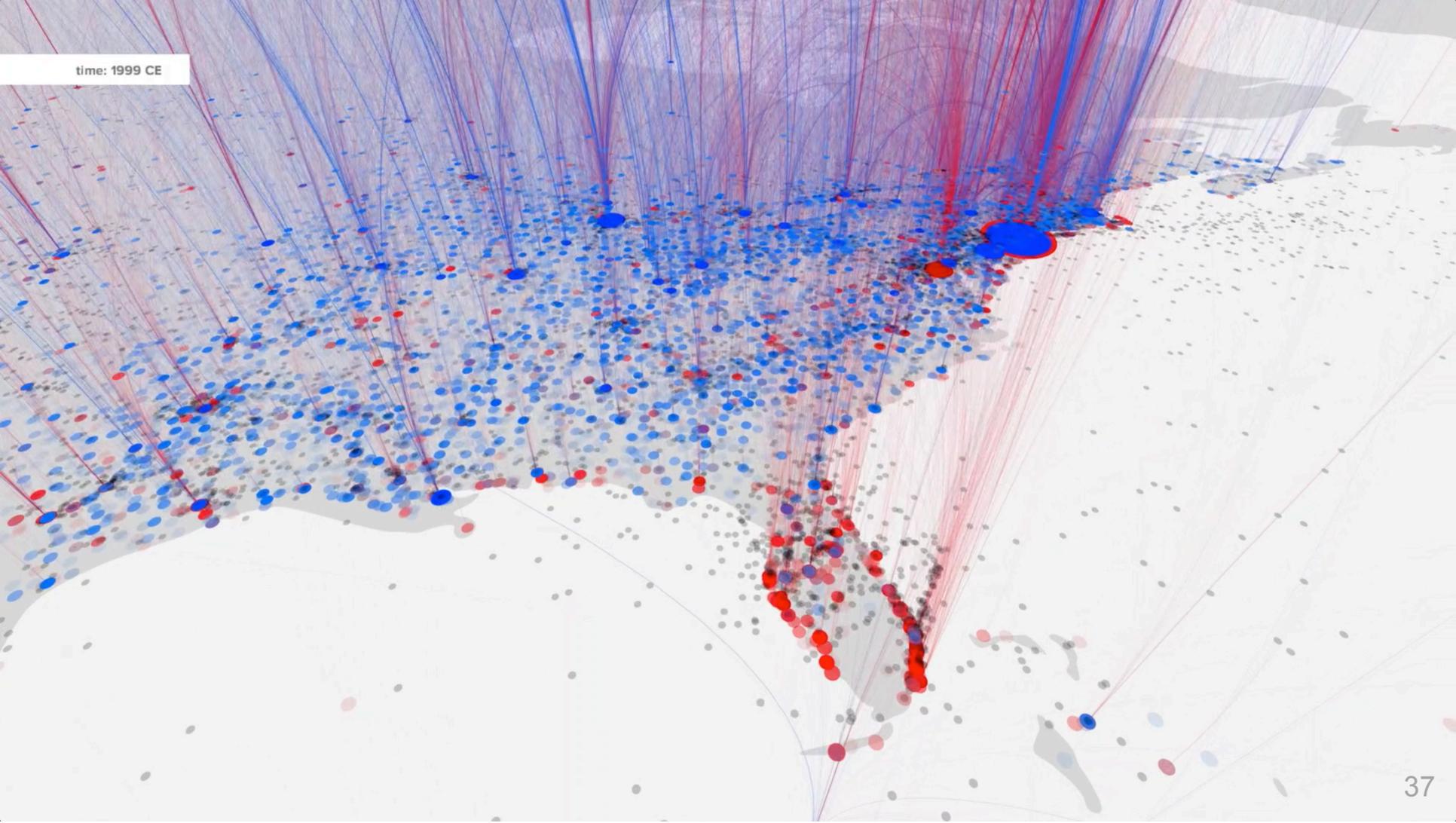
time: 1827 CE



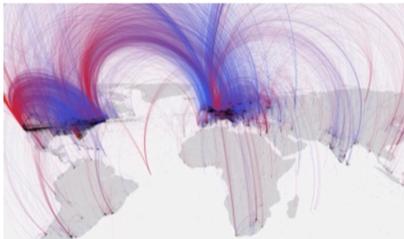
time: 1954 CE



time: 1999 CE



NEWS & COMMENT



Maximilian Schlich & Mauro Martino

Humanity's cultural history captured in 5-minute film

Video map of births and deaths shows rise and fall of cultural centres.

NEWS

Humanity's cultural history captured in 5-minute film

2 Comments

NEWS

Mysterious Siberian crater attributed to methane

2 Comments

Q&A

Five-year delay would spell end of ITER

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- HIV community reels from losses in MH17 plane tragedy
Nature | 18 Jul 2014
- Plasma physics: The fusion restarts
Nature | 23 Jul 2014
- Cancer treatment clears two Australian patients of HIV
Nature | 18 Jul 2014
- China plans super collider
Nature | 22 Jul 2014

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NEWS



Journal retracts paper linking vaccine and narcolepsy

Add comment



Humanity's cultural history captured in 5-minute film

Video map of births and deaths shows rise and fall of cultural centres.

2 Comments



Mysterious Siberian crater attributed to methane

Build-up and release of gas from thawing permafrost most probable explanation, says Russian team.

2 Comments



NASA announces instruments for 2020 Mars rover

Add comment

OPINION

Public health: A sustainable plan for China's drinking water

Tackling pollution and using different grades of water for different tasks is more efficient than making all water potable, say Tao Tao and Kunlun Xin.

Add comment

Diversity: Energy studies need social science

A broader pool of expertise is needed to understand how human behaviour affects energy demand and the uptake of technologies, says Benjamin K. Sovacool.

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Books in brief

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Neuroscience: Looking-glass wars

Patricia Smith Churchland welcomes a critique of the mirror-neuron theory linking brain and behaviour.

nature INSIGHT

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LIPIDS IN HEALTH AND DISEASE

Science jobs from naturejobs

Hair Appraisal and Measurement Senior Specialist
Unilever



Tell Science: What is the biggest challenge to global scientific collaboration?



A new tool for analyzing cultural mobility

Science reports that birth and death locations of distinguished individuals provides insights into cultural mobility. See this week's issue.

NEWS



31 JULY 2014 | LATEST NEWS

NASA's Mars 2020 rover to feature lean, nimble science payload

Rover will have to work quickly to assemble cache of rock samples



31 JULY 2014 | LATEST NEWS

Video of tribe's first contact shows both tension and friendly overtures

A video captures early moments of contact between...

SCIENCE

CURRENT ISSUE PREVIOUS ISSUES SCIENCE EXPRESS



1 AUGUST 2014, VOL. 345, #6196

QUANTITATIVE SOCIAL SCIENCE

A network framework of cultural history

DINOSAUR EVOLUTION

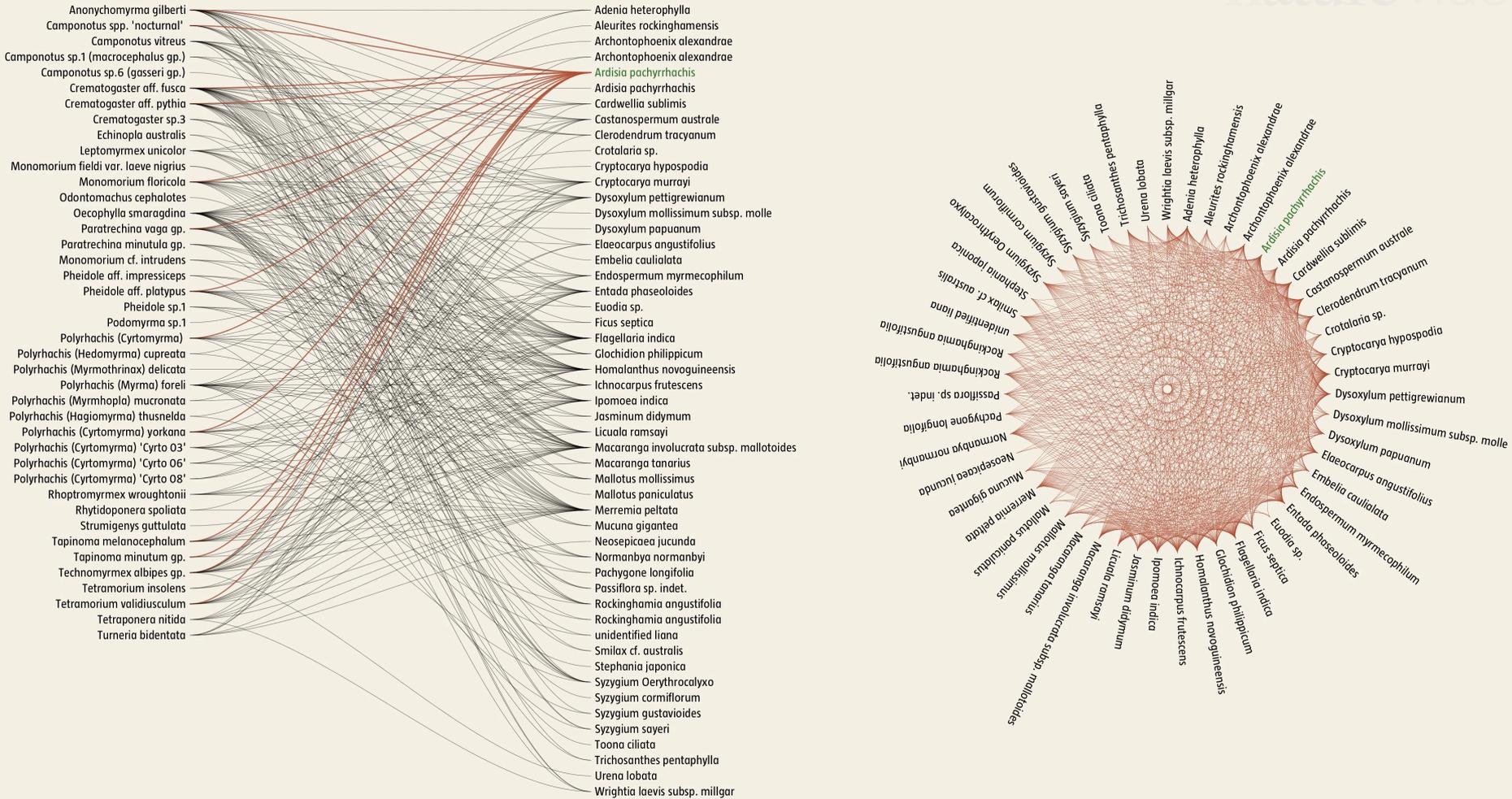
Sustained miniaturization and anatomical innovation in the dinosaurian ancestors of birds

Table of

Exhibition

Network Earth

<https://www.youtube.com/watch?v=xZ3OmlbtaMU>





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mamartino.com@gmail.com