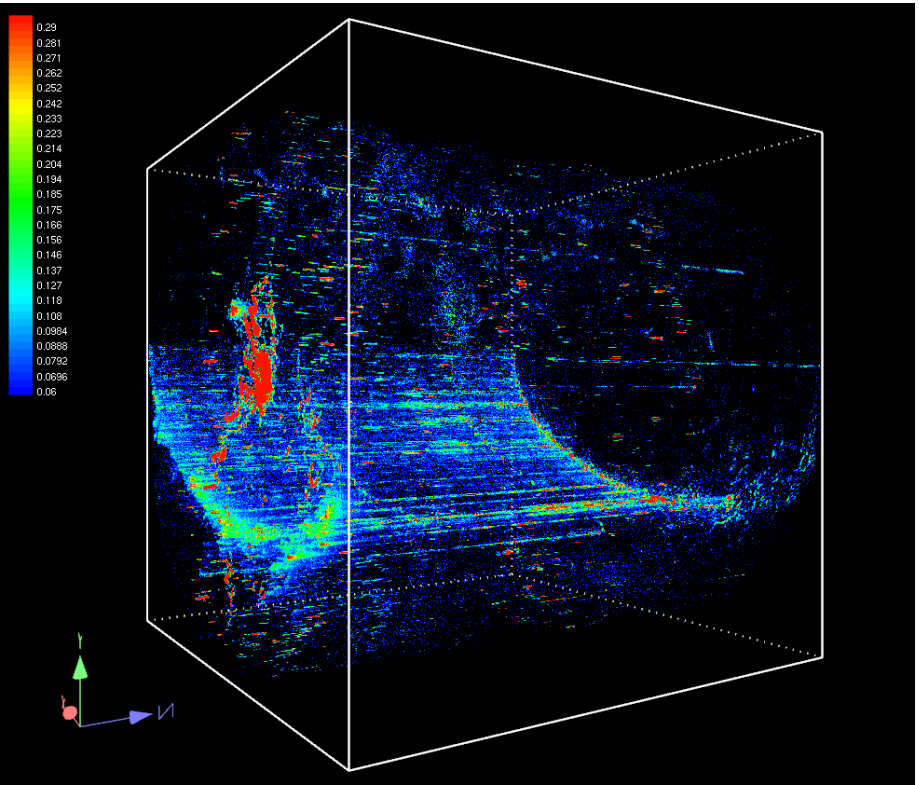
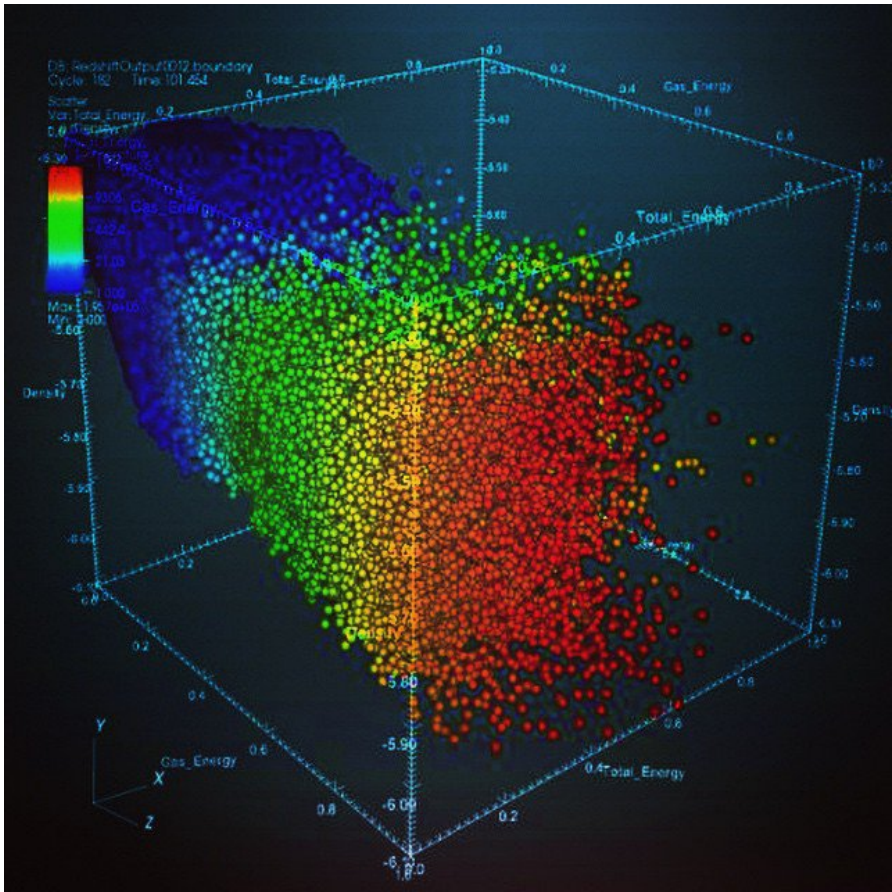
3D Visualization

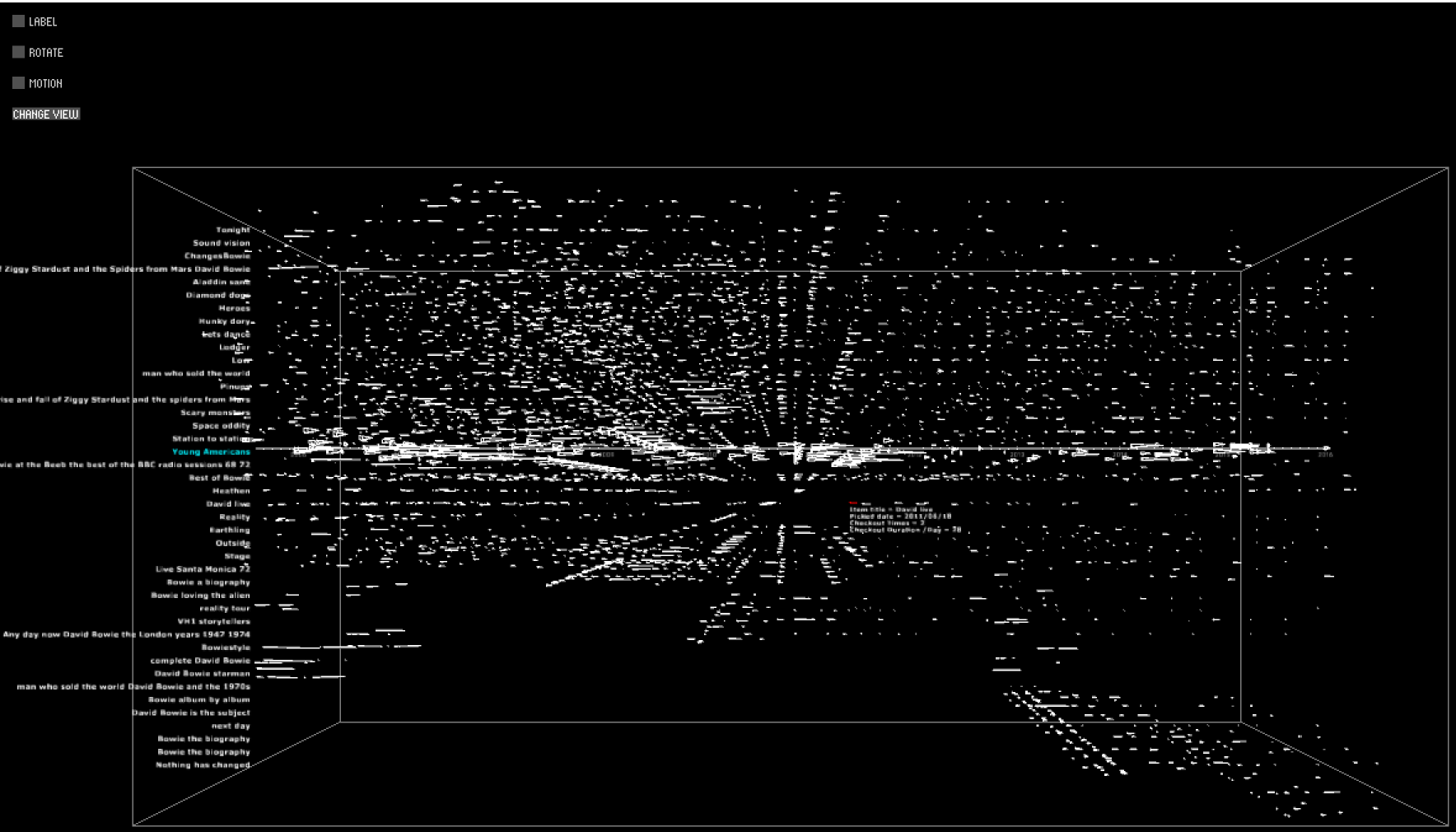
M259 DataVis, MAT, 2018 winter

From overall form to detail / 3D scatter plot

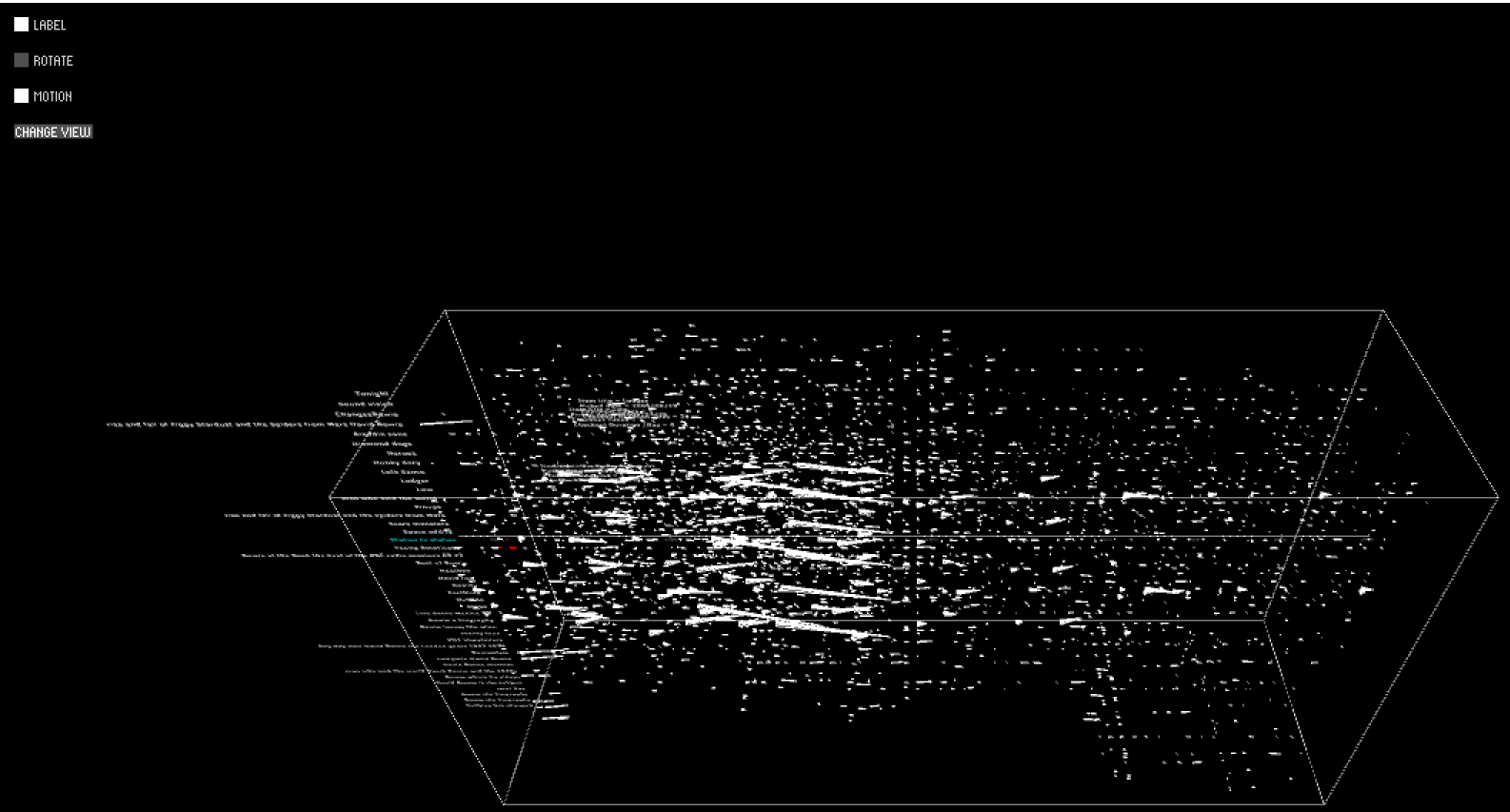




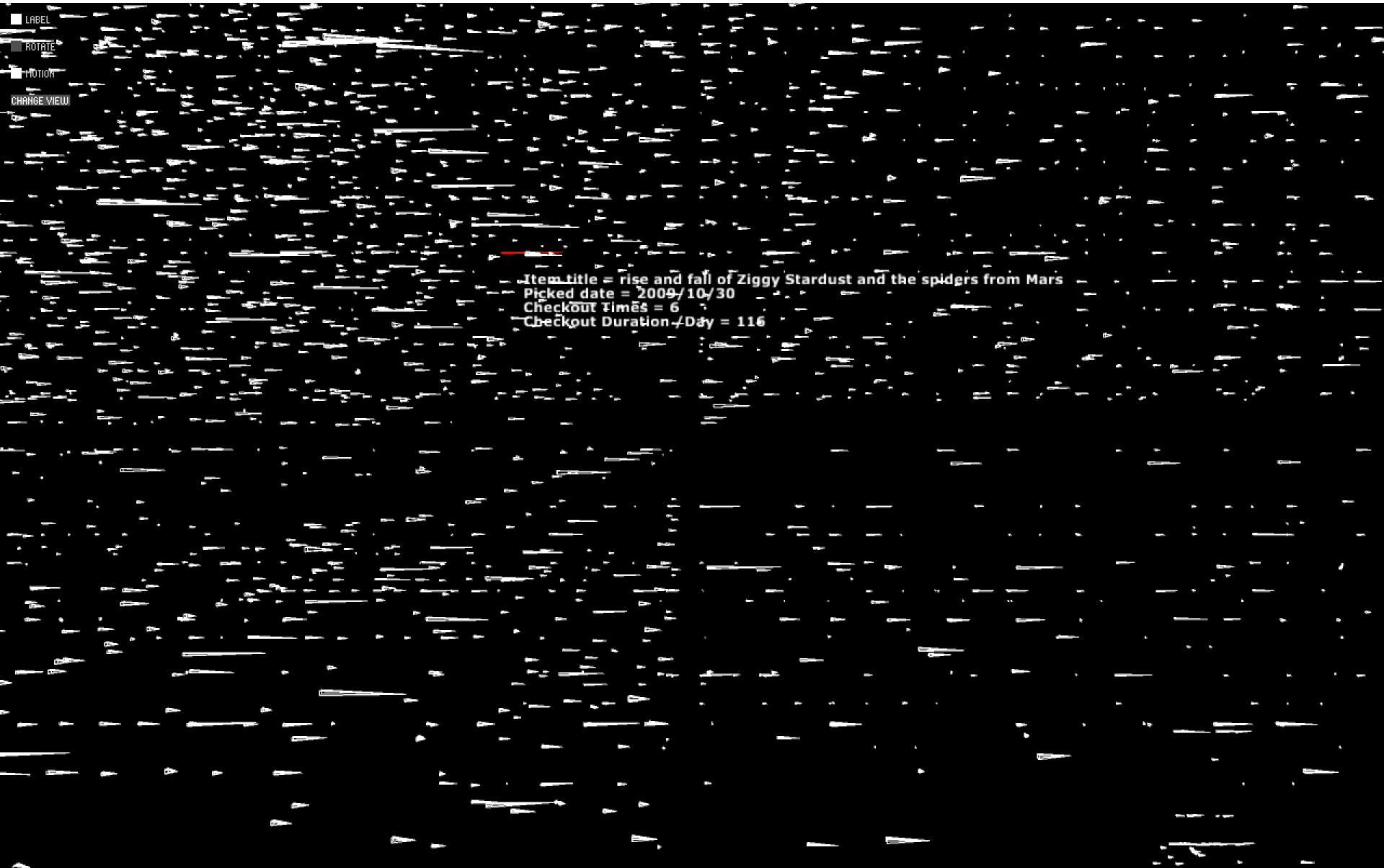
Particles


LABEL
ROTATE
MOTION
CHANGE VIEW
Tonight
Sound vision
ChangesBowie
Ziggy Stardust and the Spiders from Mars David Bowie
Aladdin sane
Diamond dogs
Heroes
Hunky dory
Lets dance
Lodger
Low
man who sold the world
Pinups
rise and fall of Ziggy Stardust and the spiders from Mars
Scary monsters
Space oddity
Station to station
Young Americans
wie at the Beeb the best of the BBC radio sessions 68 72
Best of Bowie
Heathen
David live
Reality
Earthling
Outside
Stage
Live Santa Monica 72
Bowie a biography
Bowie loving the alien
reality tour
VH1 storytellers
Any day now David Bowie the London years 1947 1974
Bowiestyle
complete David Bowie
David Bowie starman
man who sold the world David Bowie and the 1970s
Bowie album by album
David Bowie is the subject
next day
Bowie the biography
Bowie the biography
Nothing has changed

Particles

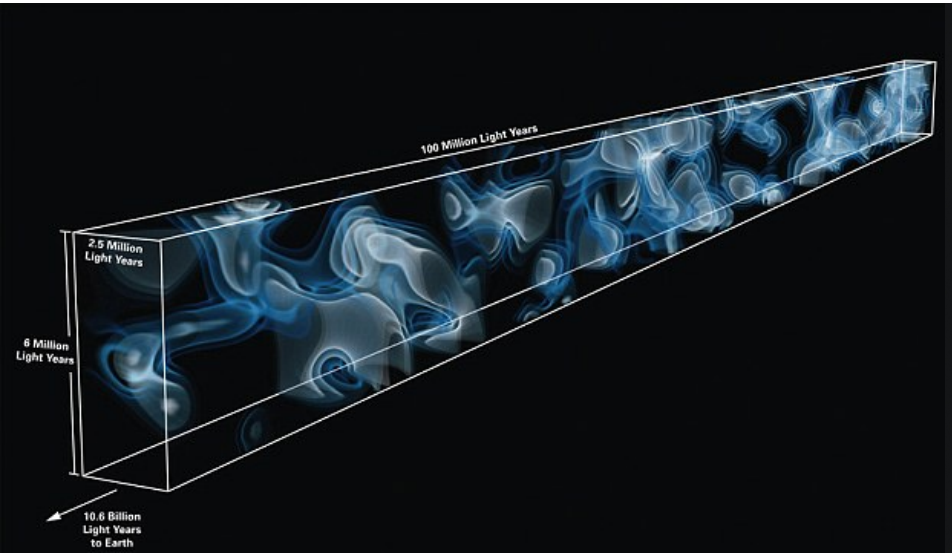


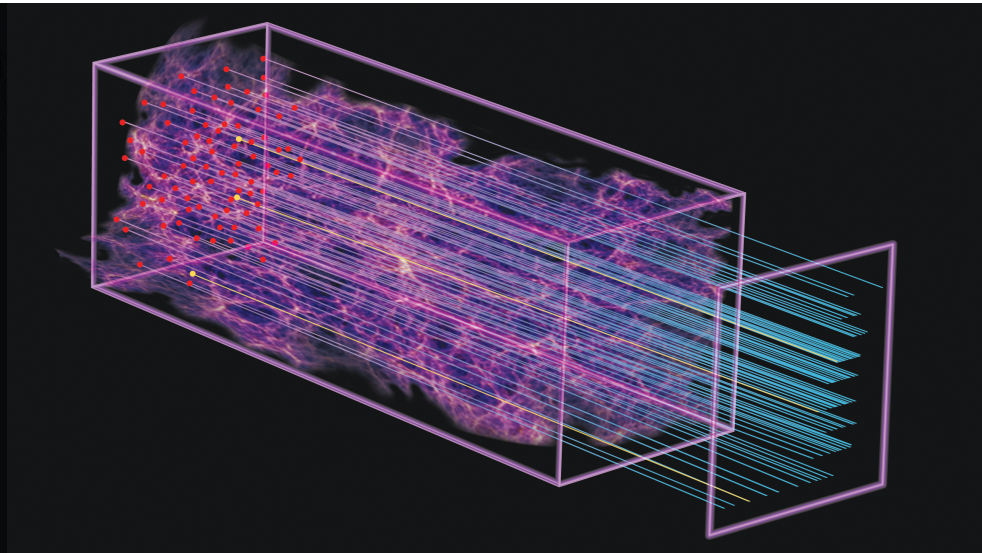
Particles


LABEL
ROTATE
MOTION
CHANGE VIEW
Item title = rise and fall of Ziggy Stardust and the spiders from Mars
Picked date = 2009/10/30
Checkout Times = 6
Checkout Duration/Day = 116

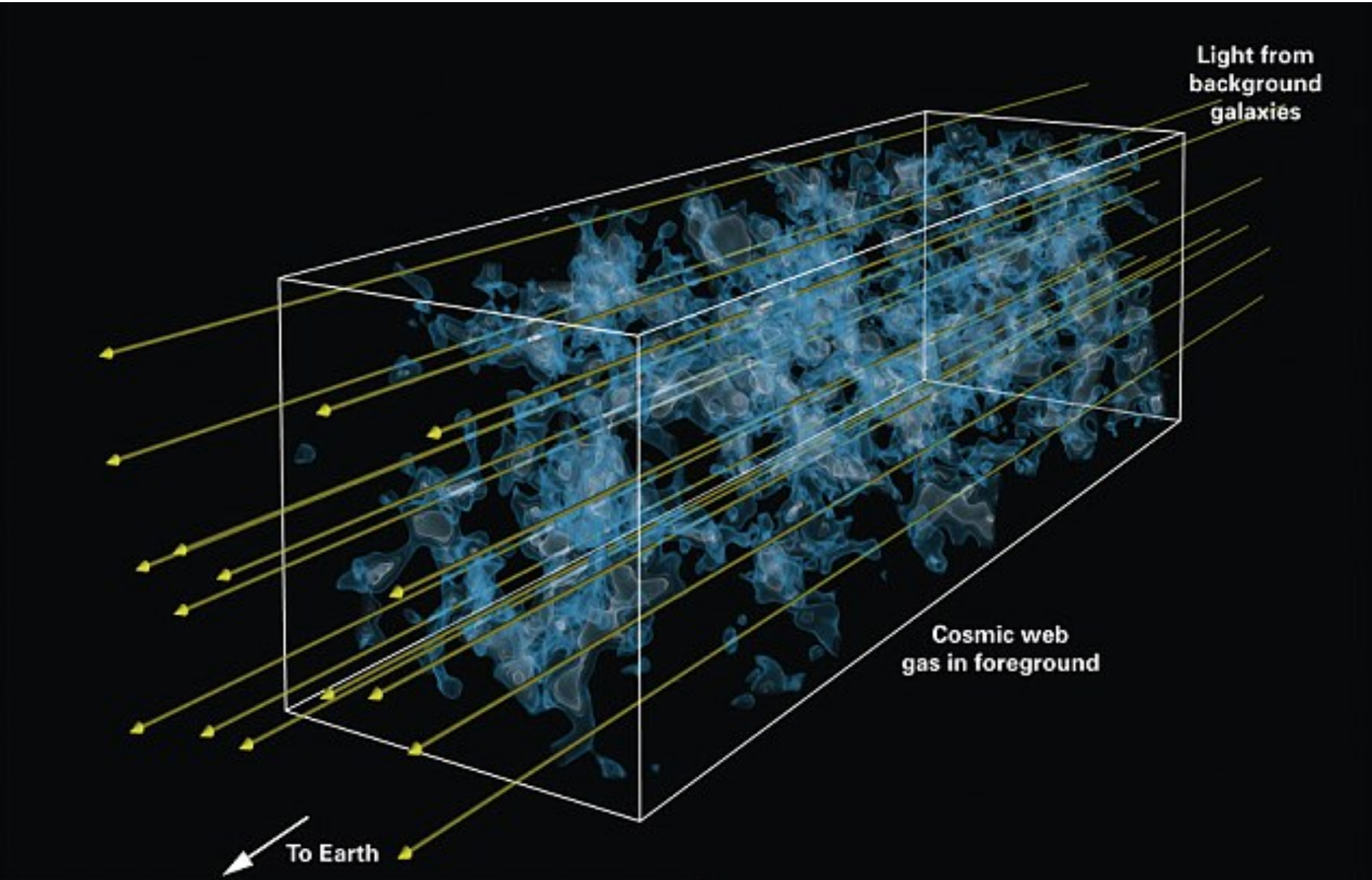
Directional: Change over time

Change over time: how data may evolve represented linearly (diachronic) and meanwhile articulate its relation to other data in the same time (synchronic)

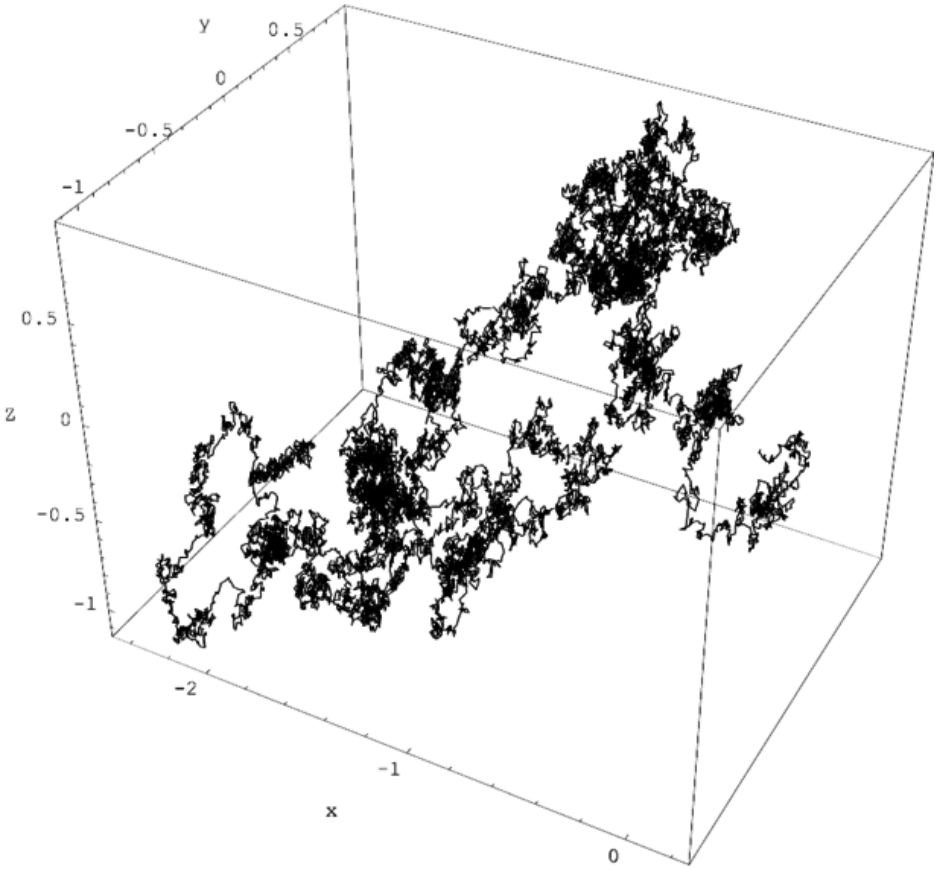


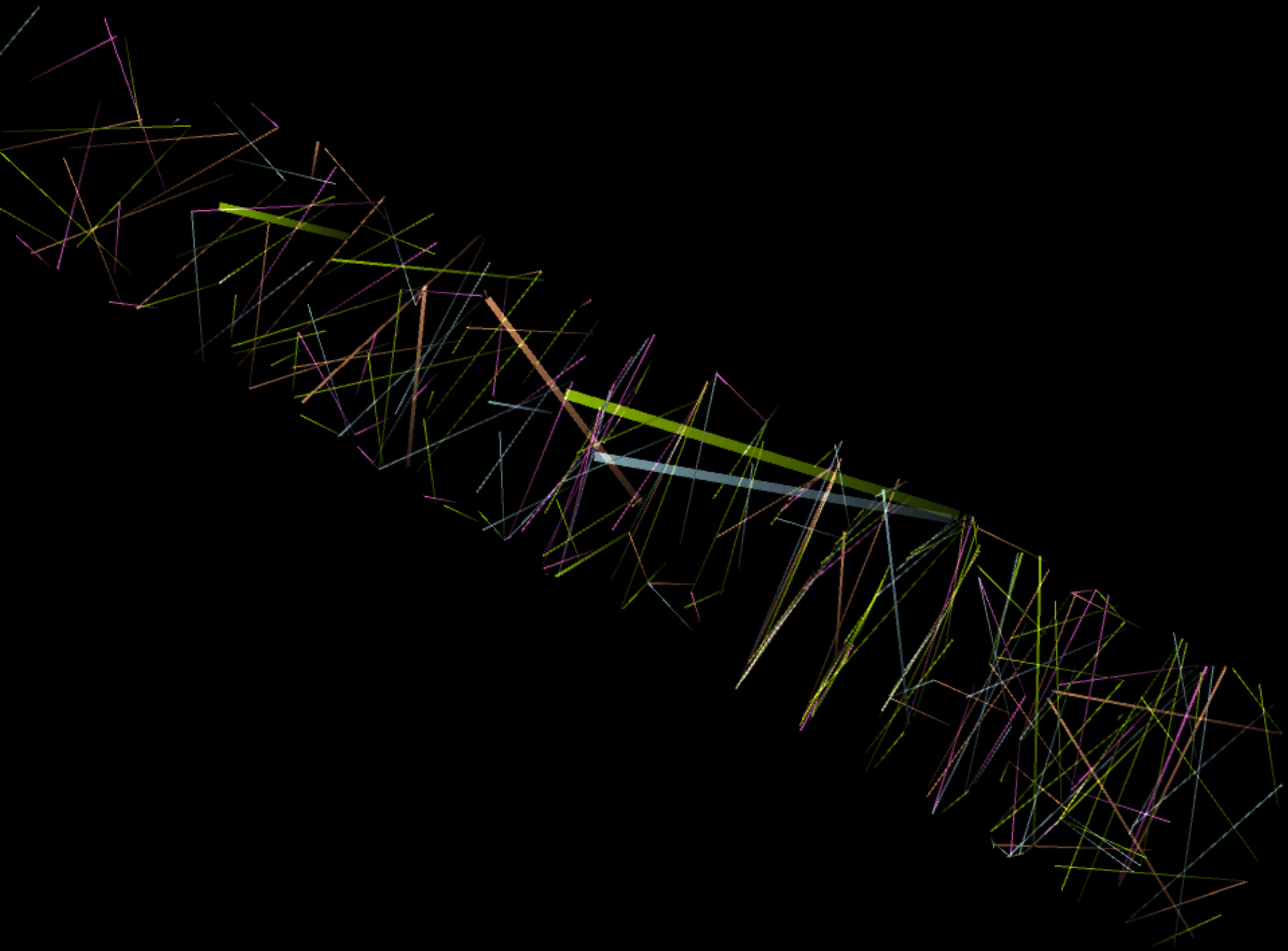


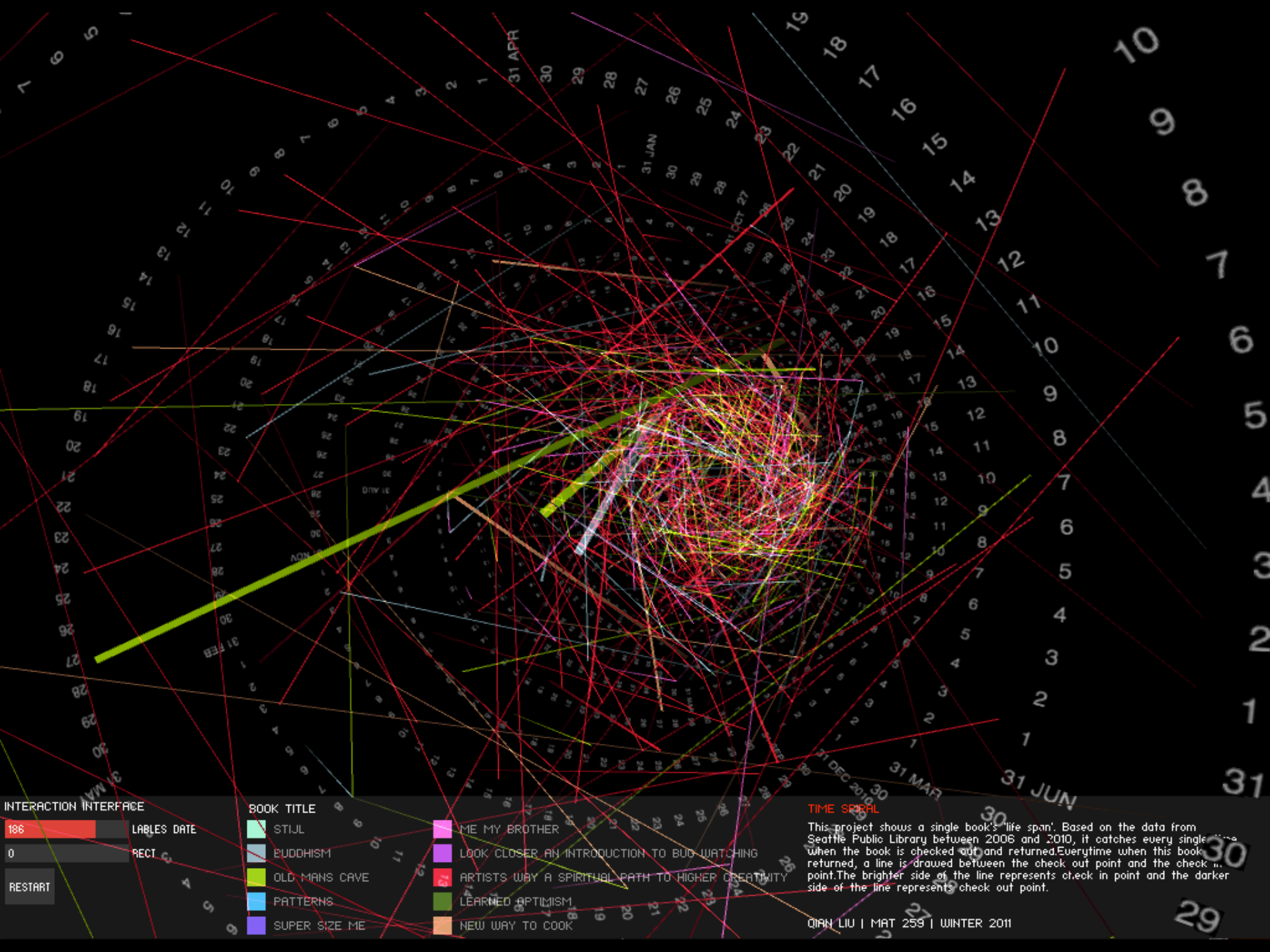
Directional: Change over time

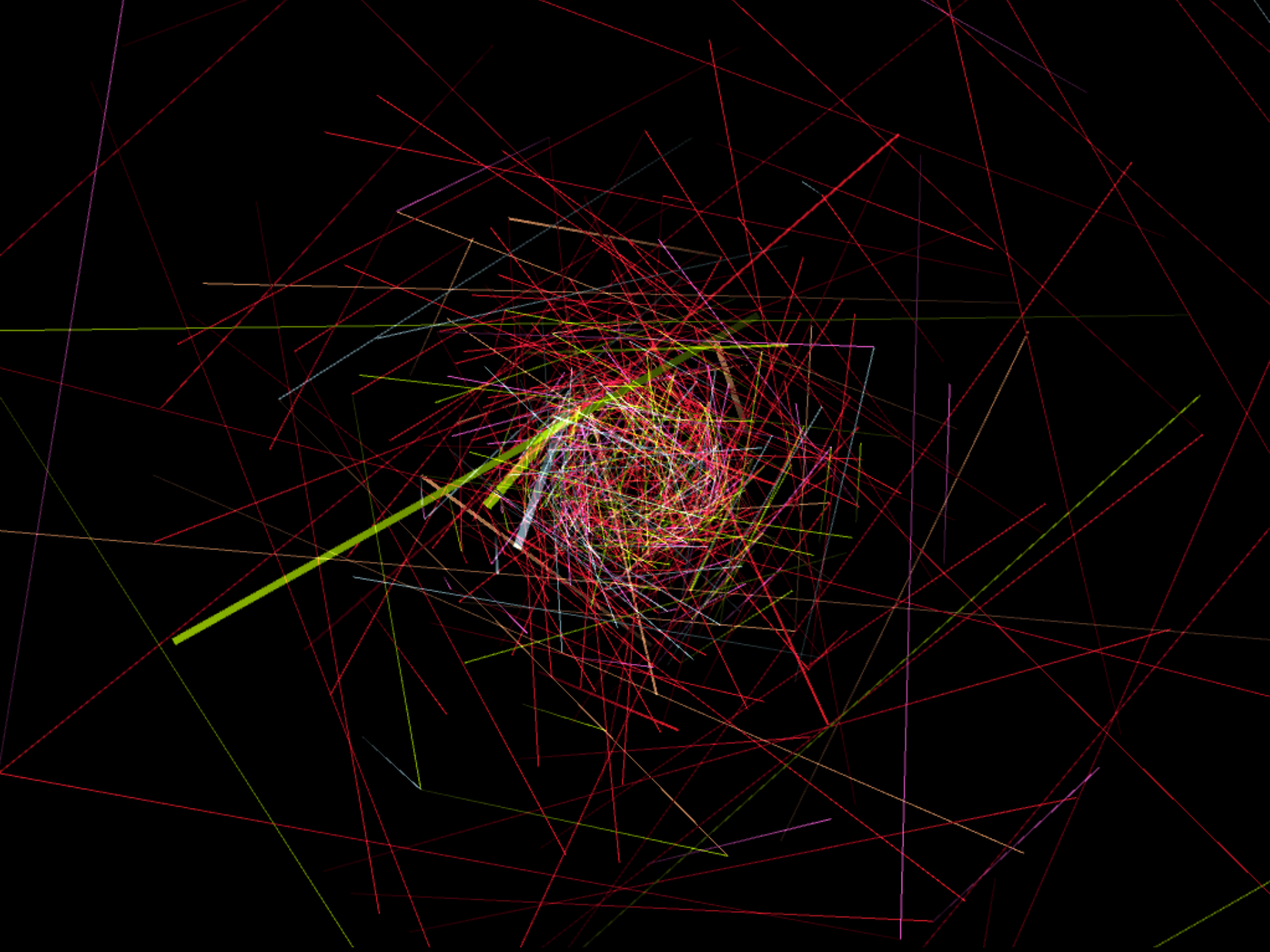


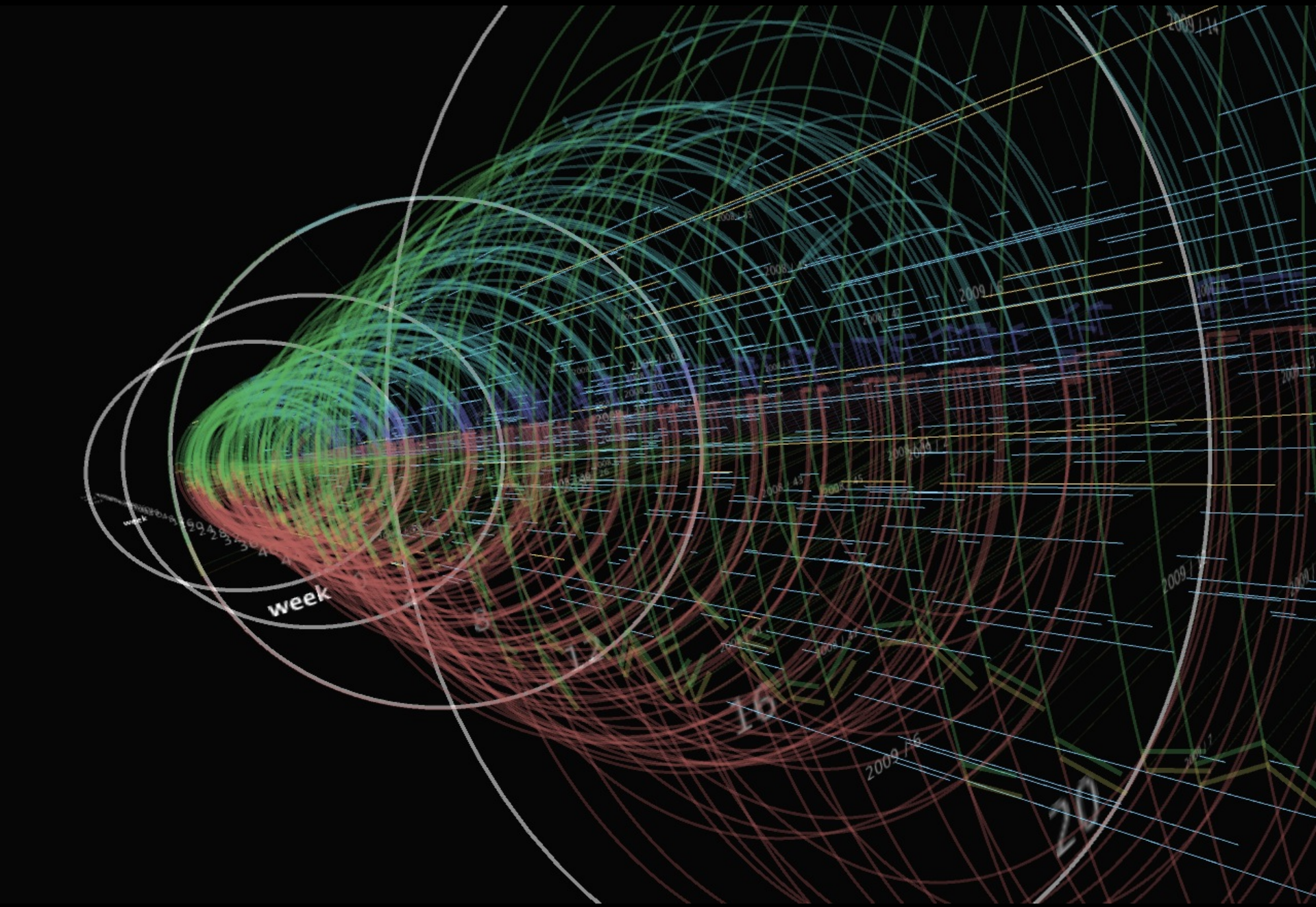
From data to form

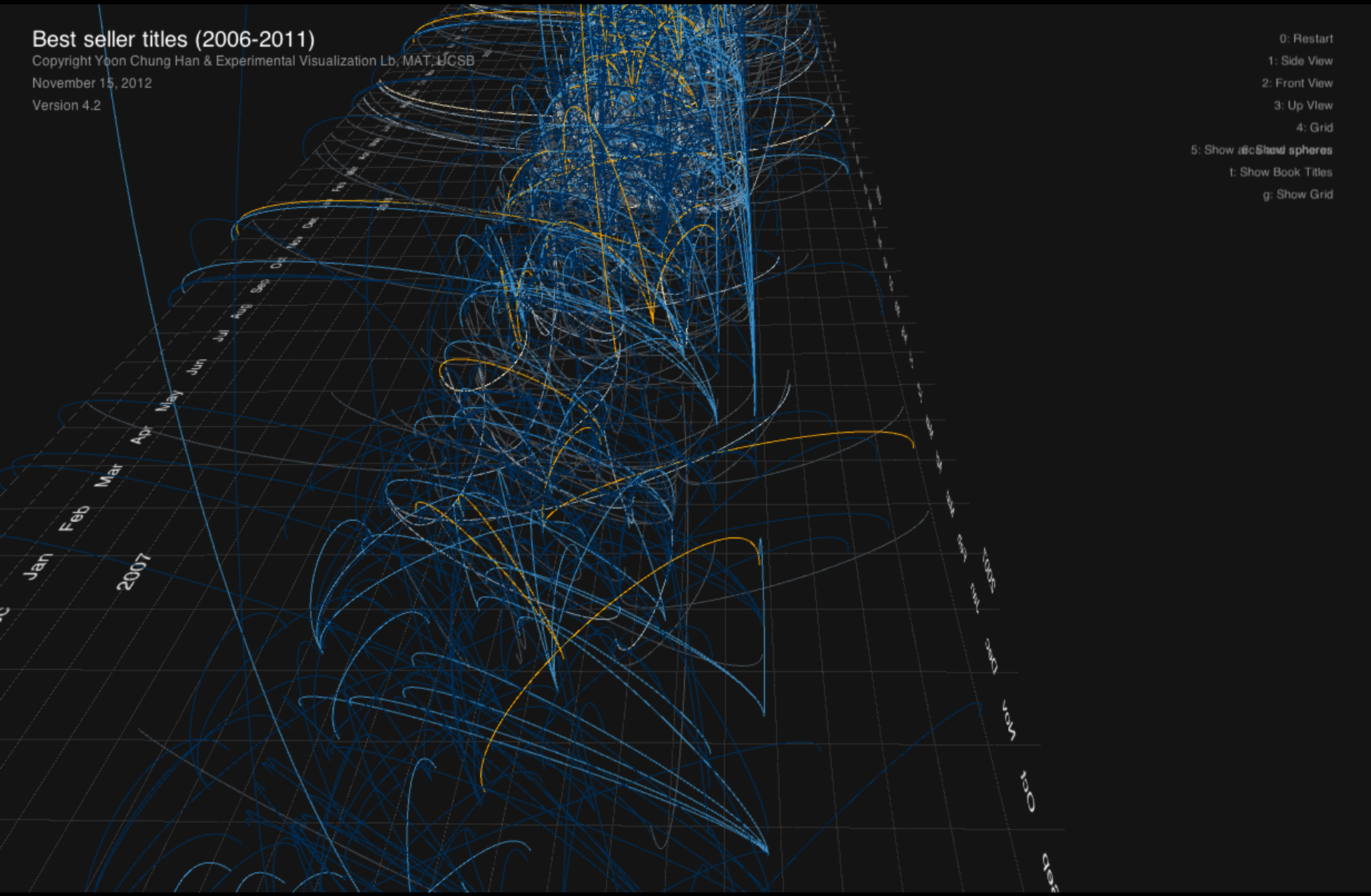




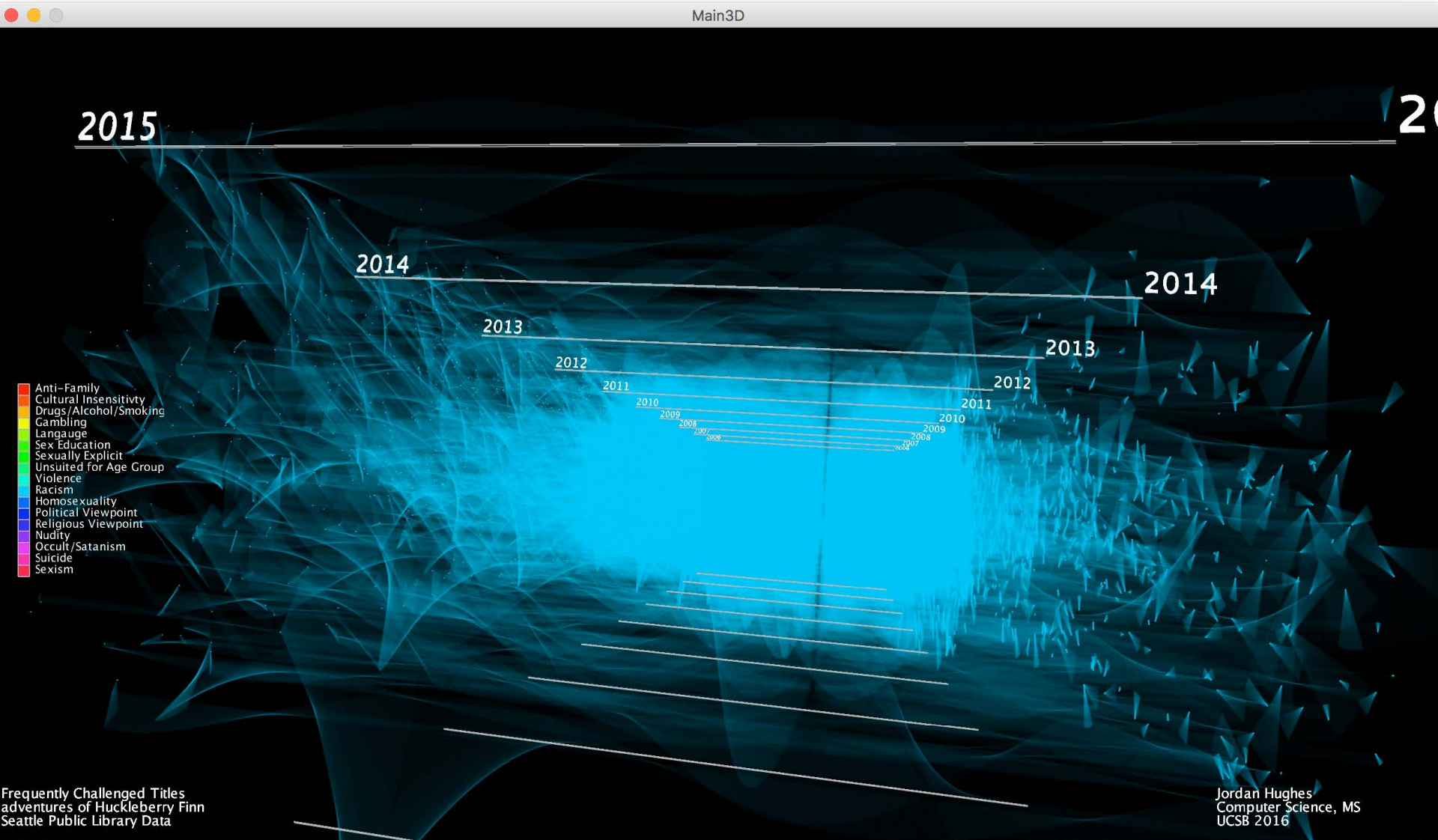

INTERACTION INTERFACE
186
LABLES DATE
0
RECT
RESTART
BOOK TITLE
STIJL
BUDDHISM
OLD MANS CAVE
PATTERNS
SUPER SIZE ME
ME MY BROTHER
LOOK CLOSER AN INTRODUCTION TO BUG WATCHING
ARTISTS WAY A SPIRITUAL PATH TO HIGHER CREATIVITY
LEARNED OPTIMISM
NEW WAY TO COOK
TIME SPIRAL
This project shows a single book's 'life span'. Based on the data from Seattle Public Library between 2006 and 2010, it catches every single time when the book is checked out and returned.Everytime when this book returned, a line is drawed between the check out point and the check ... point.The brighter side of the line represents check in point and the darker side of the line represents check out point.
QIAN LIU | MAT 259 | WINTER 2011

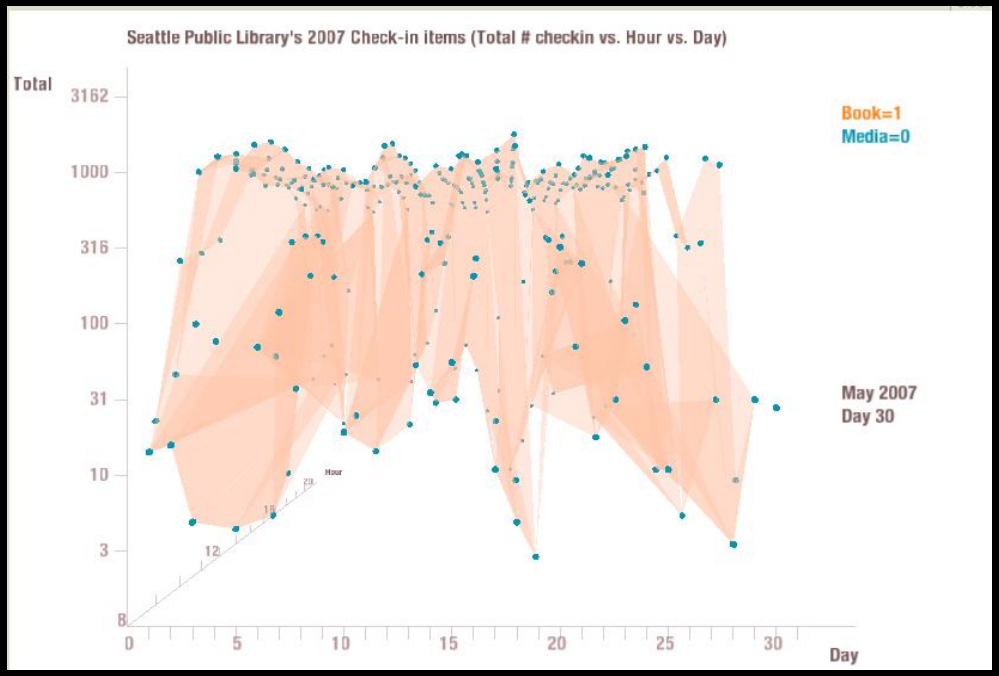


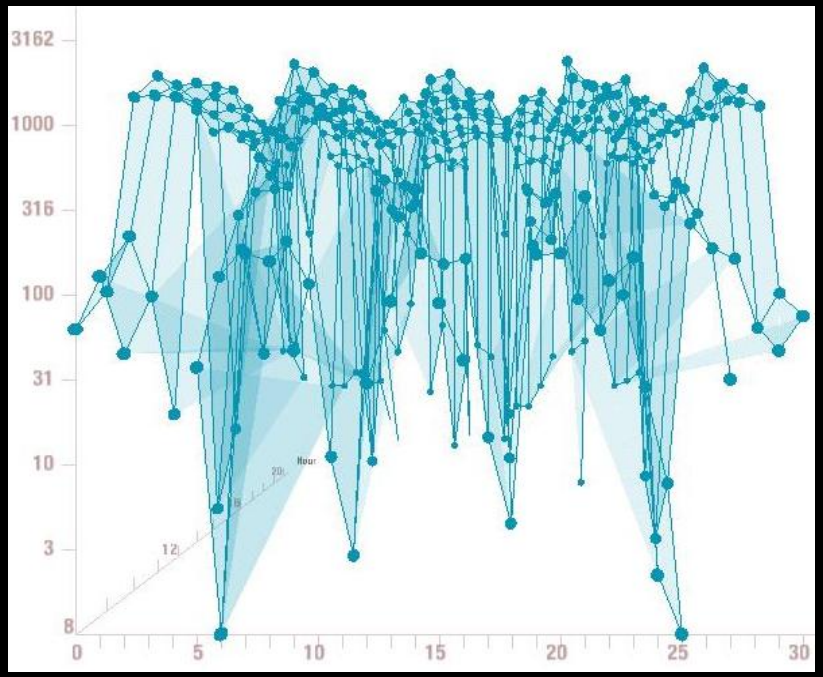

week
week
8
12
16
20

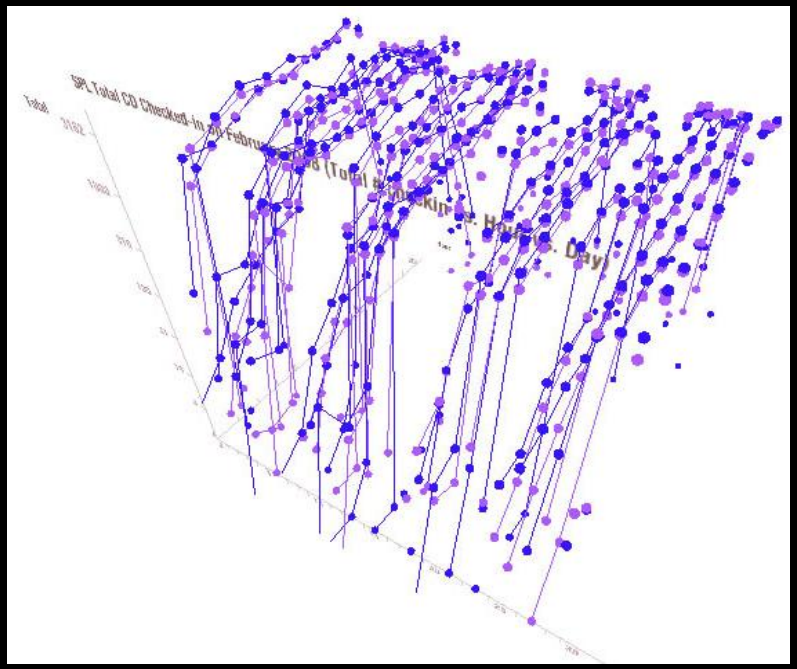

Best seller titles (2006-2011)
Copyright Yoon Chung Han & Experimental Visualization Lb, MAT, UCSB
November 15, 2012
Version 4.2
0: Restart
1: Side View
2: Front View
3: Up VIew
4: Grid
5: Show accessed spheres
t: Show Book Titles
g: Show Grid
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2007
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

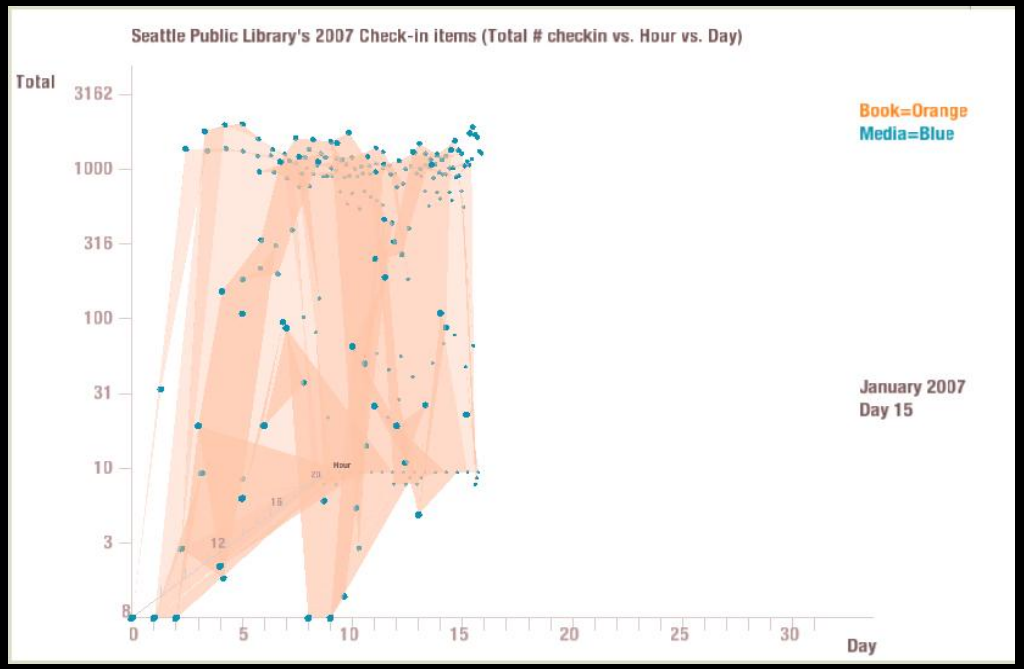
Directional: Change over time




Seattle Public Library's 2007 Check-in items (Total # checkin vs. Hour vs. Day)
Total
3162
1000
316
100
31
10
3
8
Book=1
Media=0
May 2007
Day 30
Hour
Day
0
5
10
15
20
25
30


3162
1000
316
100
31
10
3
8
Hour
0
5
10
15
20
25
30




Seattle Public Library's 2007 Check-in items (Total # checkin vs. Hour vs. Day)
Total
3162
1000
316
100
31
10
3
8
Book=Orange
Media=Blue
January 2007
Day 15
Hour
Day
0
5
10
15
20
25
30

STAR WARS NEBULA

Using Data of Checkout Times and Duration Times of the Former 6 in This Movie Series in Seattle Public Library

Year

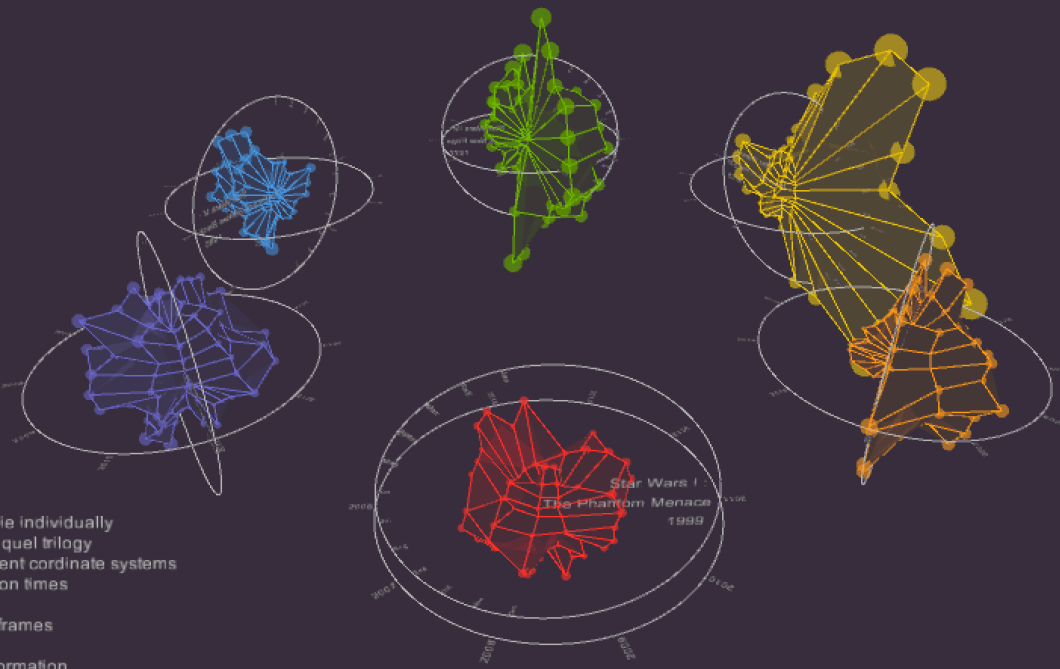
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015

Month

January
February
March
April
May
June
July
August
September
October
November
December

Reset

Years
Months
All



Junxiang Yao
MAT259 PROJ 2
3D Interaction & Change Over Time

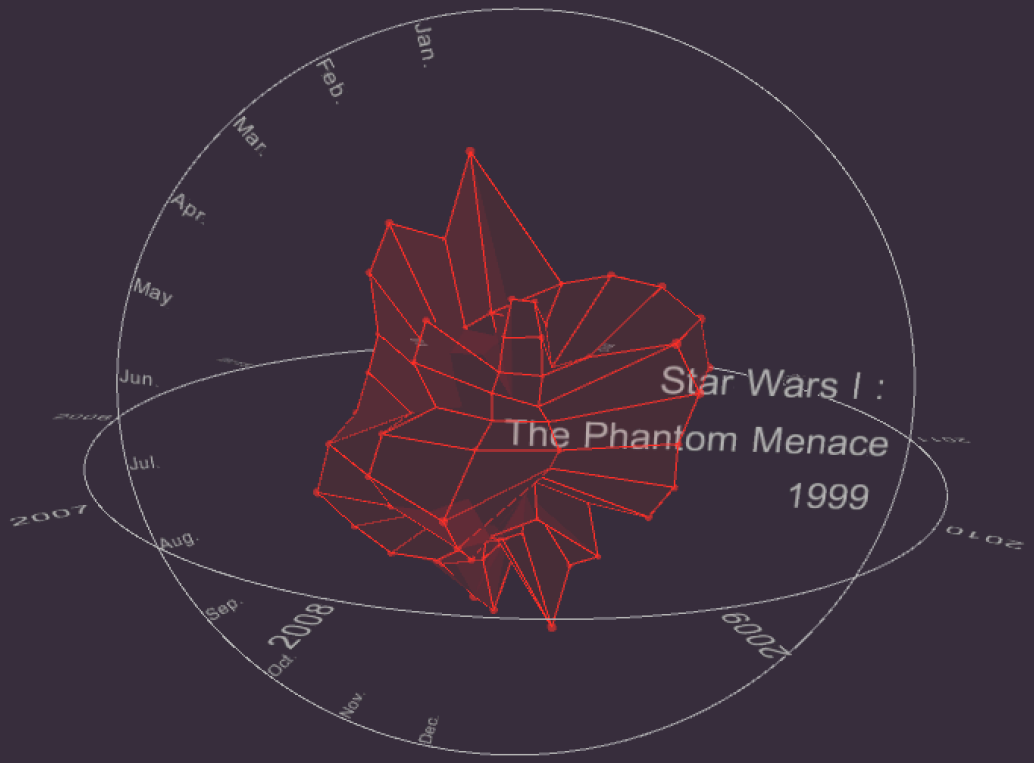
The radius of the circular cordinate axis is 200 checkout times.

Duration time scaling:

40 80 120 160 200 240

Keyboard Control

Press 1 / 2 / 3 / 4 / 5 / 6 to check movie individually
Press 7 / 8 to check the original / prequel trilogy
Press 9 / 0 to check all in one / different cordinate systems
Press D to show / hide dots of duration times
Press S to show / hide the solids
Press N to show / hide the cromatic frames
Press F to show / hide grey frames
Press T to show / hide the verbal information
Press L to show / hide the cordinate axis and lables


Jan.
Feb.
Mar.
Apr.
May
Jun.
Jul.
Aug.
Sep.
Oct.
Nov.
Dec.
2007
2008
2009
2010
Star Wars I :
The Phantom Menace
1999

STAR WARS NEBULA

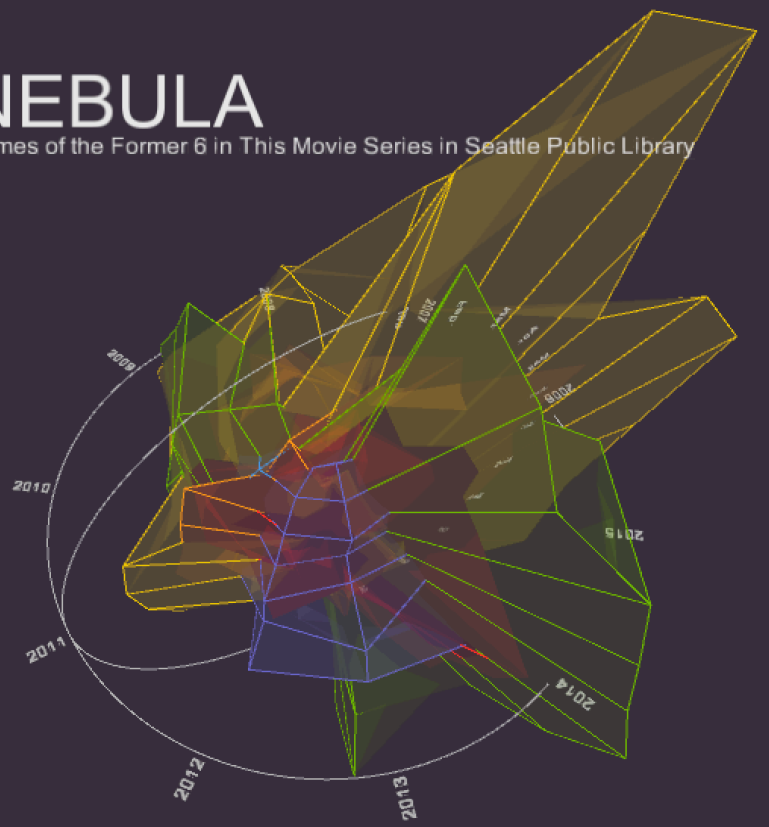
Using Data of Checkout Times and Duration Times of the Former 6 in This Movie Series in Seattle Public Library

Year	Month
2006	January
2007	February
2008	March
2009	April
2010	May
2011	June
2012	July
2013	August
2014	September
2015	October
	November
	December

Reset

Years
Months
All

- Star Wars IV (1977)
- Star Wars V (1980)
- Star Wars VI (1983)
- Star Wars I (1999)
- Star Wars II (2002)
- Star Wars III (2005)



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Press D to show / hide dots of duration times
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Press T to show / hide the verbal information
Press L to show / hide the cordinate axis and lables

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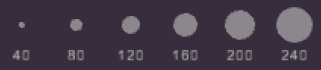

STAR WARS NEBULA

Using Data of Checkout Times and Duration Times of the Former 6 in This Movie Series in Seattle Public Library

Year	Month
2006	January
2007	February
2008	March
2009	April
2010	May
2011	June
2012	July
2013	August
2014	September
2015	October
	November
	December

Reset

Years
Months
All

- Star Wars IV (1977)
- Star Wars V (1980)
- Star Wars VI (1983)
- Star Wars I (1999)
- Star Wars II (2002)
- Star Wars III (2005)

Keyboard Control

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Press F to show / hide grey frames
Press T to show / hide the verbal information
Press L to show / hide the cordinate axis and lables

Junxiang Yao
MAT259 PROJ 2
3D Interaction & Change Over Time

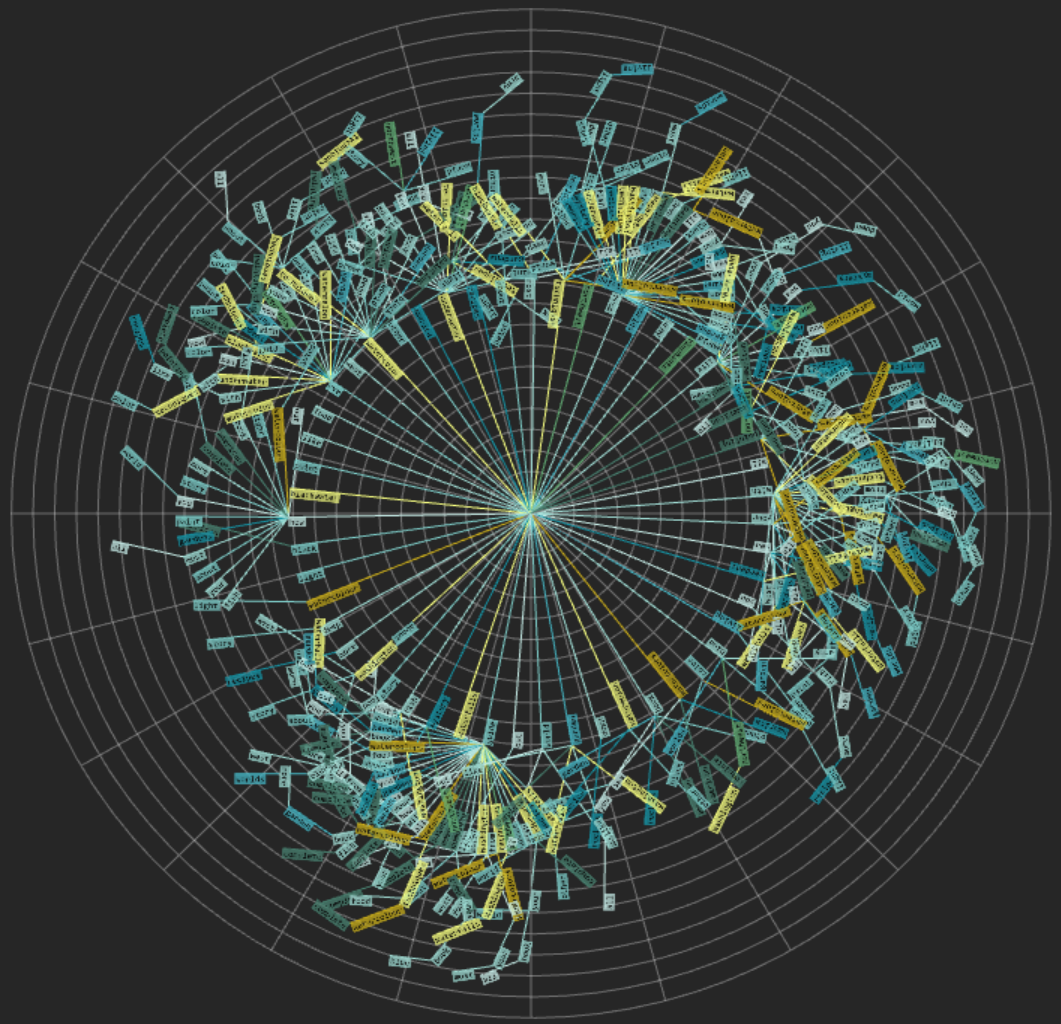
The radius of the circular cordinate axis is 200 checkout times.

Duration time scaling:

40 80 120 160 200 240

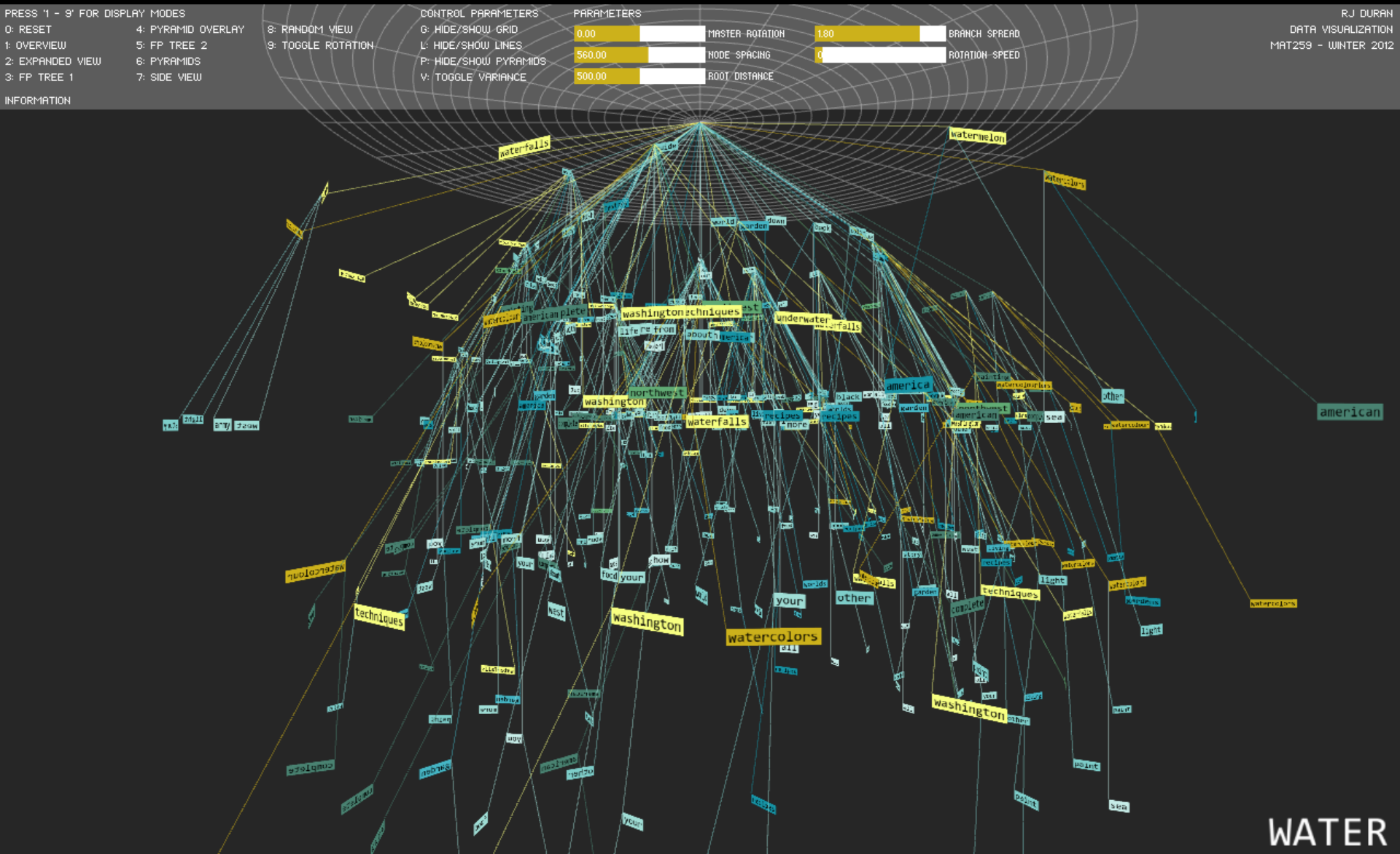
Associative (FPTree Algorithm)

INFORMATION

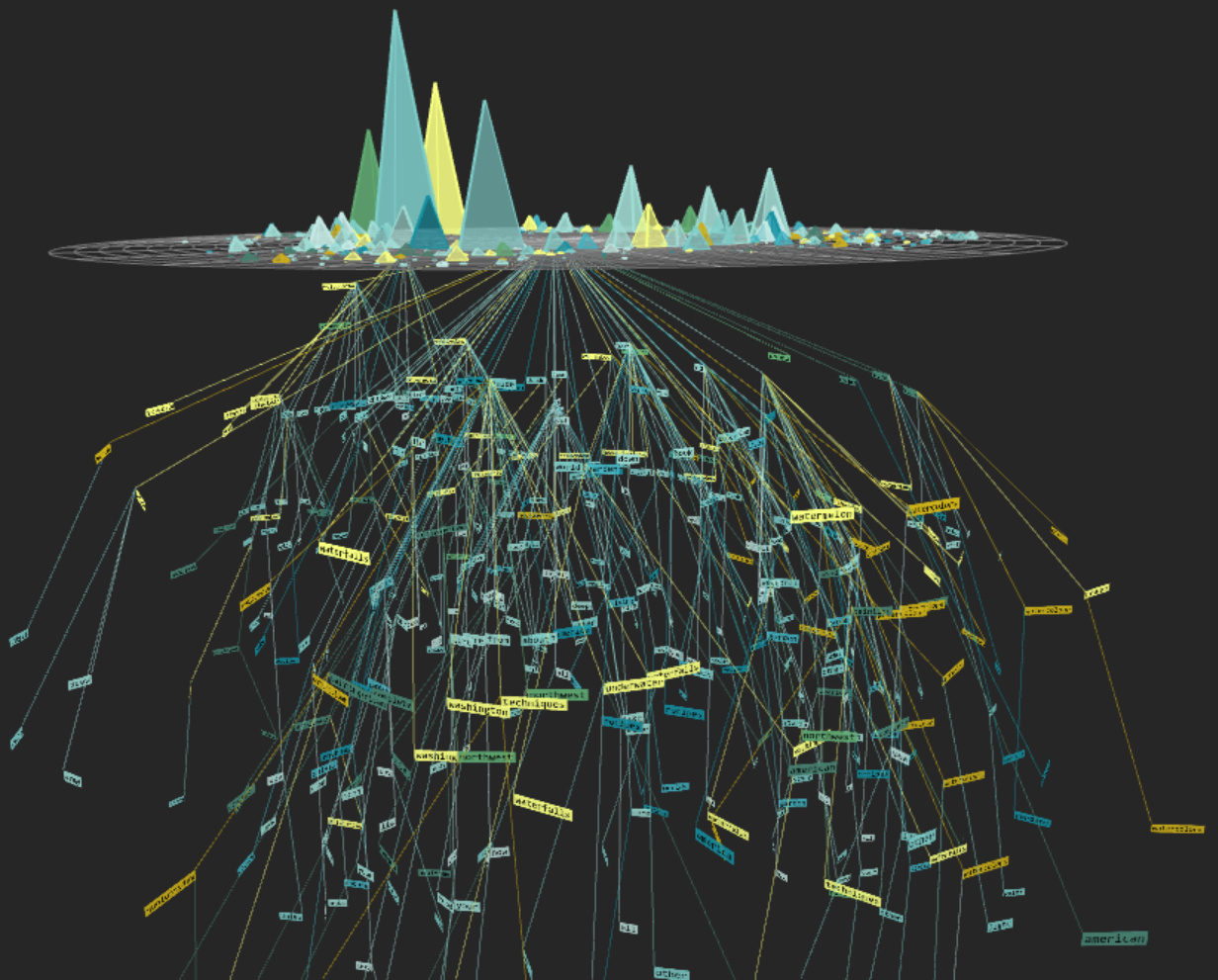


WATER

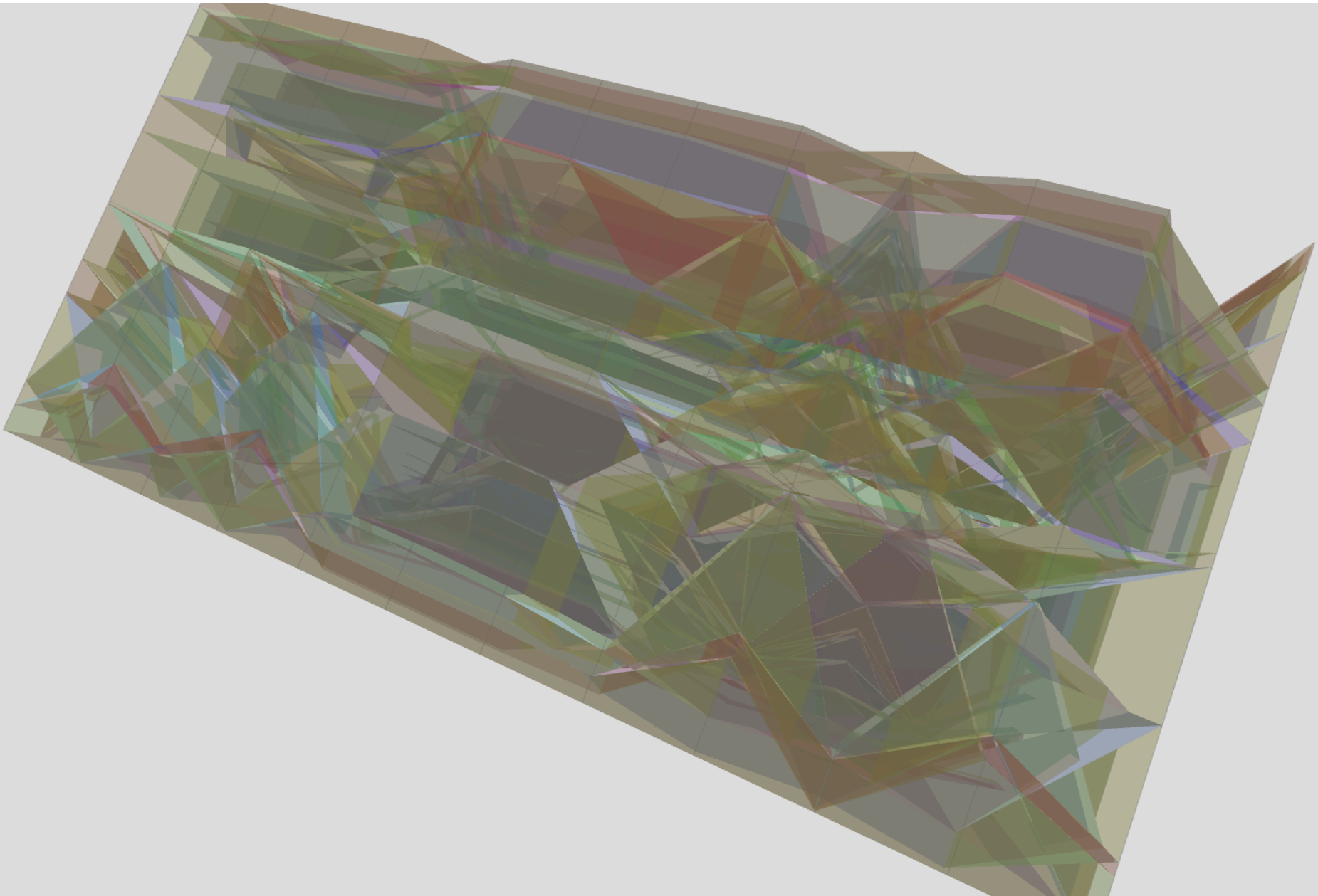
Associative (FPTree Algorithm)



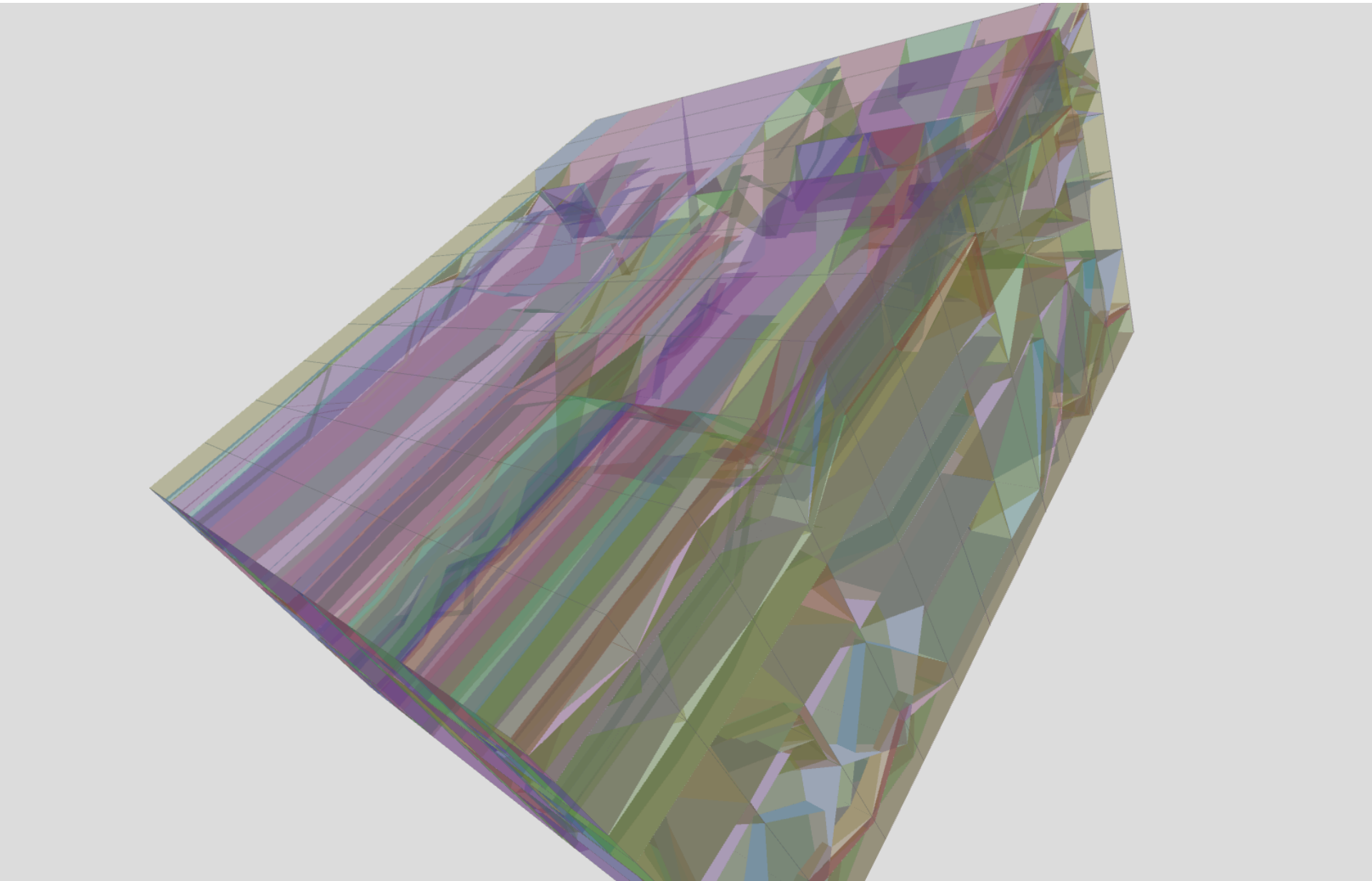
Associative (FPTree Algorithm)

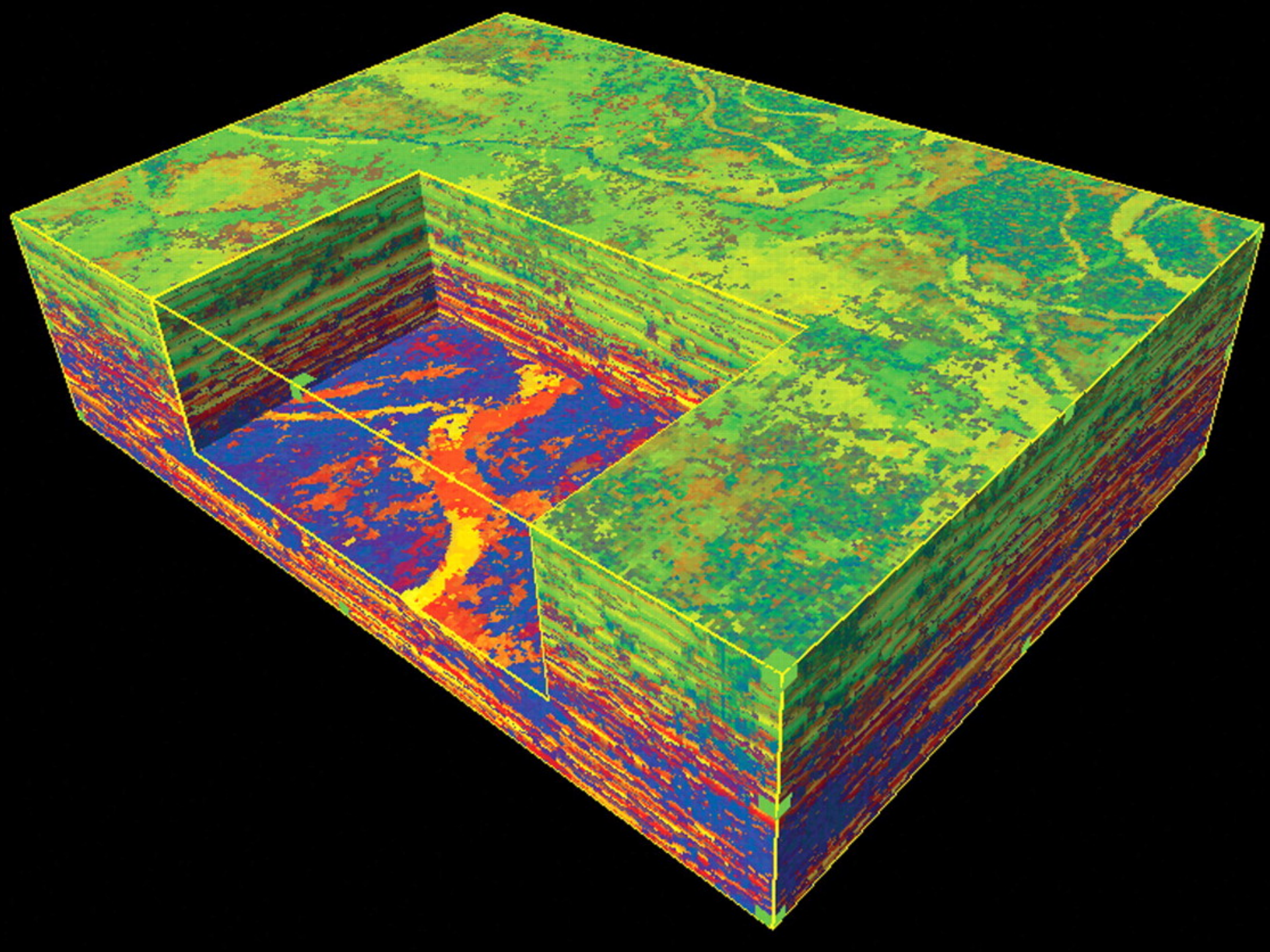


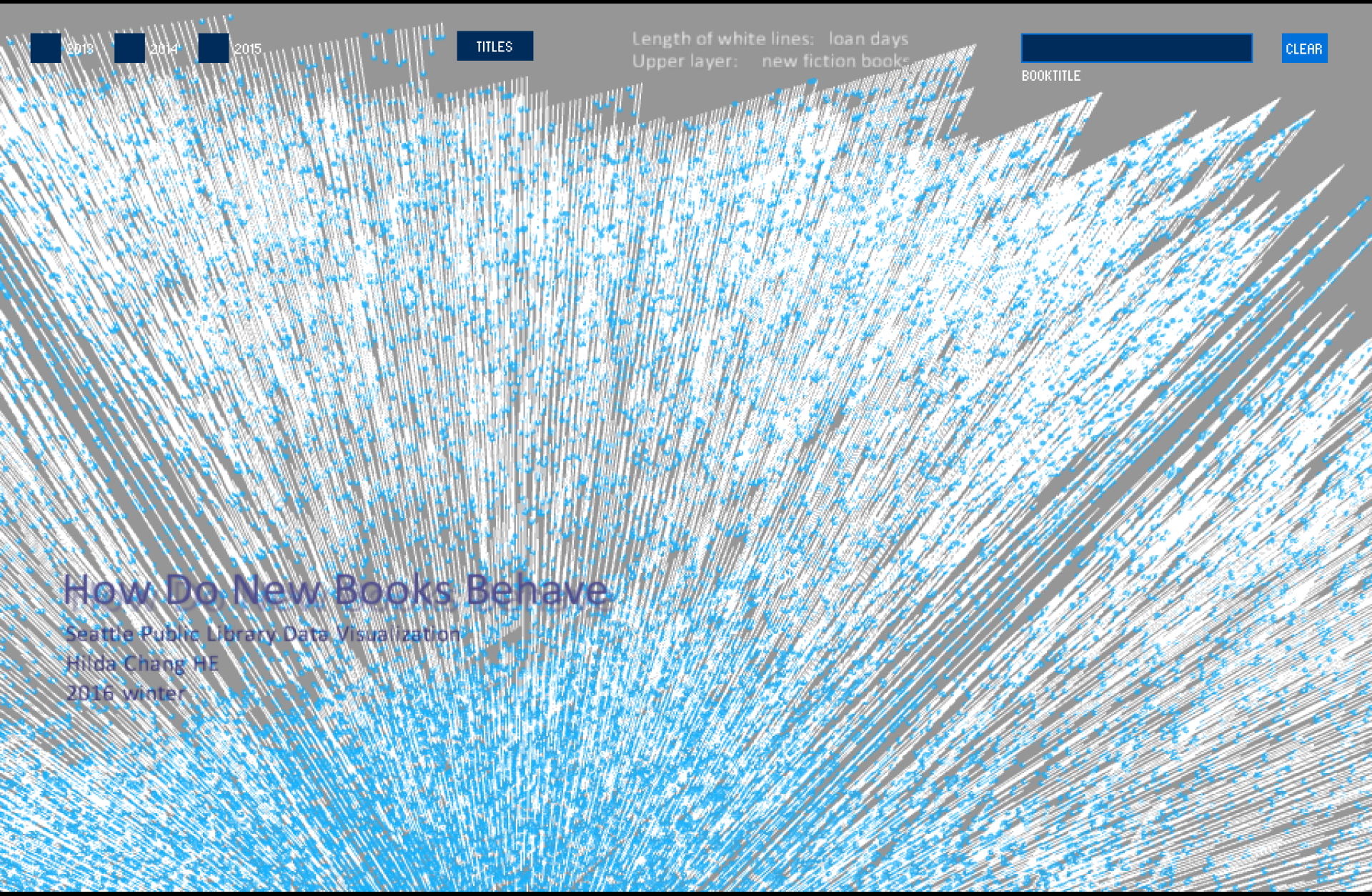
Data Density

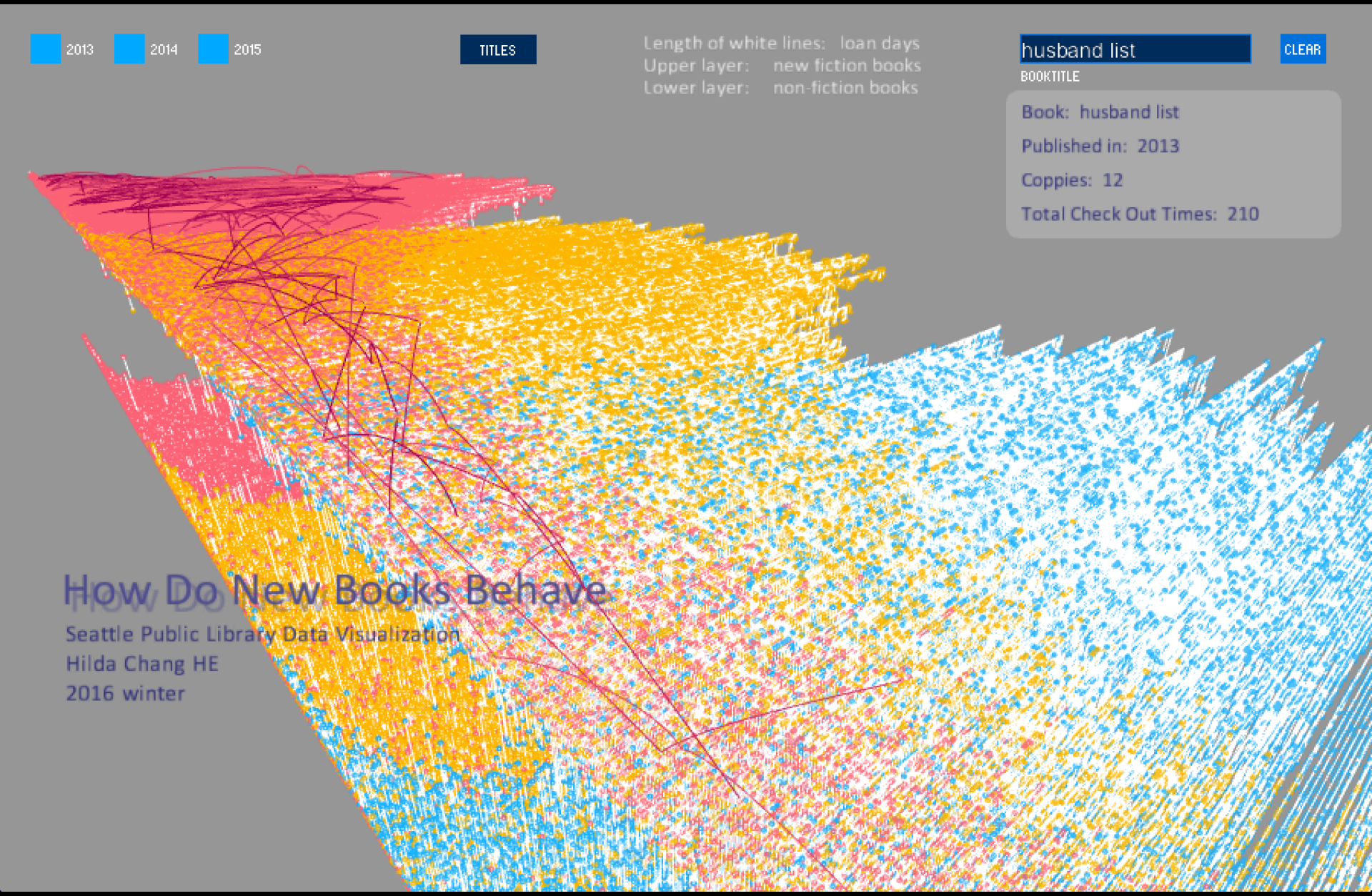


Data Density

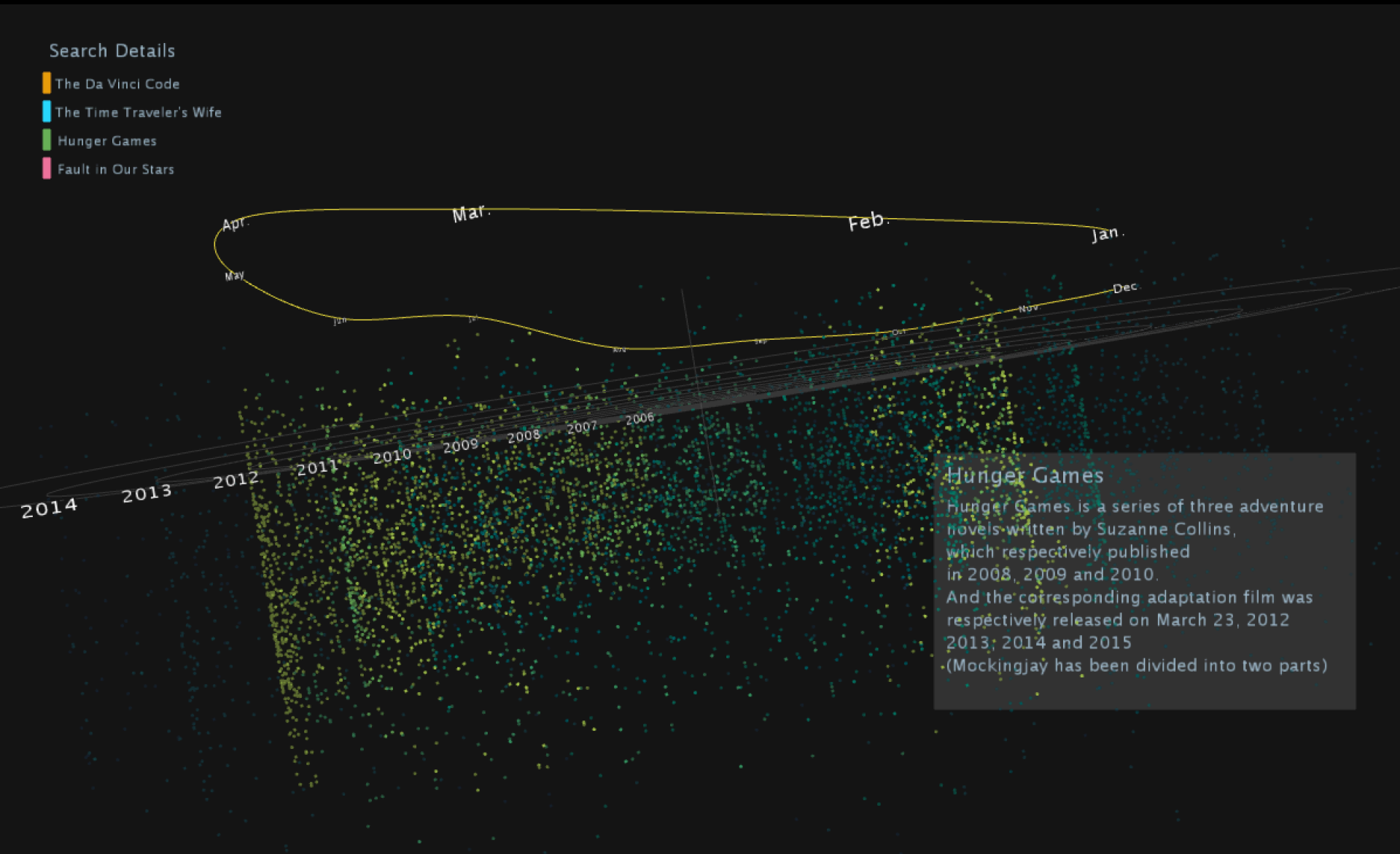




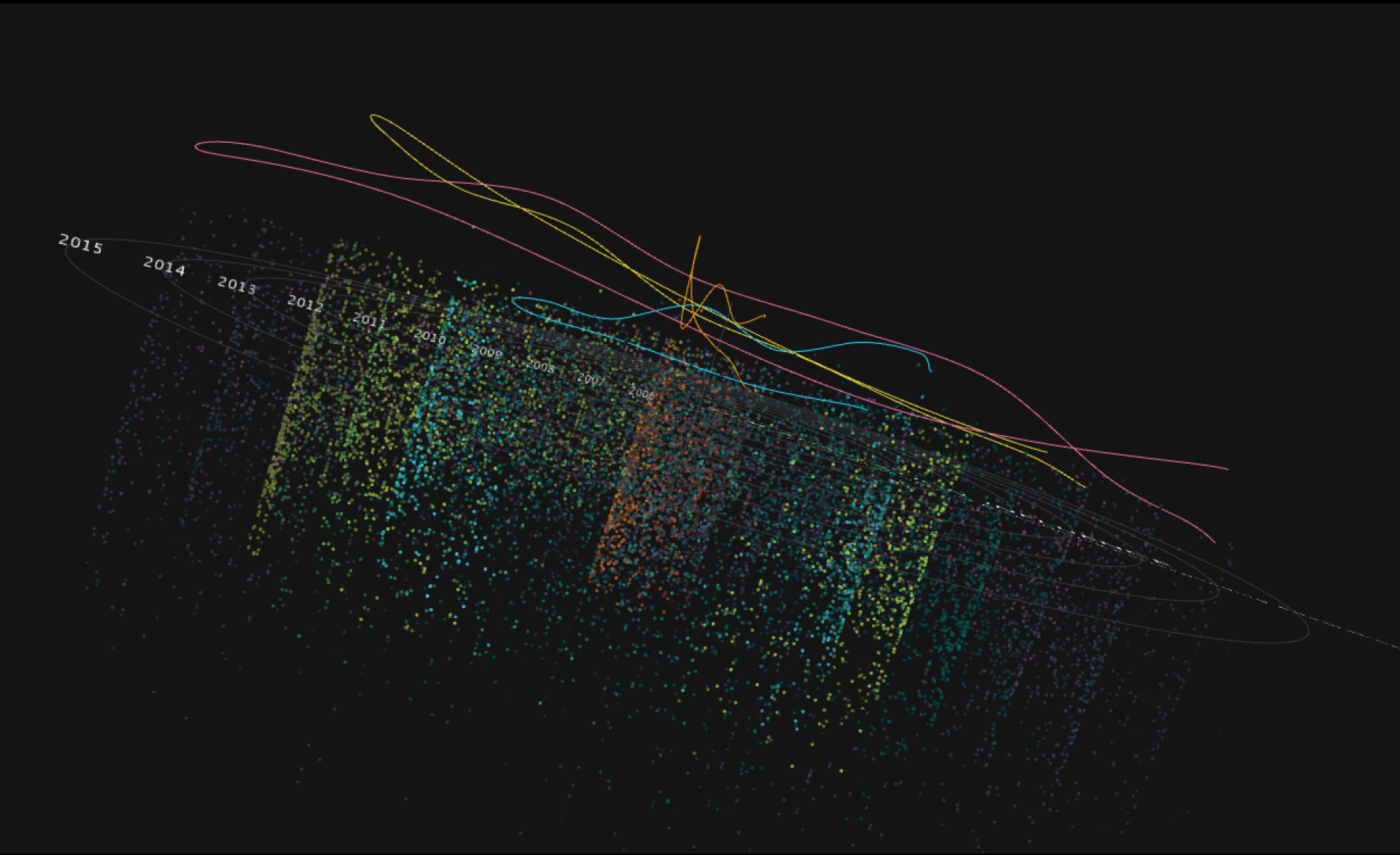

2013
2014
2015
TITLES
Length of white lines: loan days
Upper layer: new fiction books
CLEAR
BOOKTITLE
How Do New Books Behave
Seattle Public Library Data Visualization
Hilda Chang HE
2016 winter


2013
2014
2015
TITLES
Length of white lines: loan days
Upper layer: new fiction books
Lower layer: non-fiction books
husband list
CLEAR
BOOKTITLE
Book: husband list
Published in: 2013
Coppies: 12
Total Check Out Times: 210
How Do New Books Behave
Seattle Public Library Data Visualization
Hilda Chang HE
2016 winter

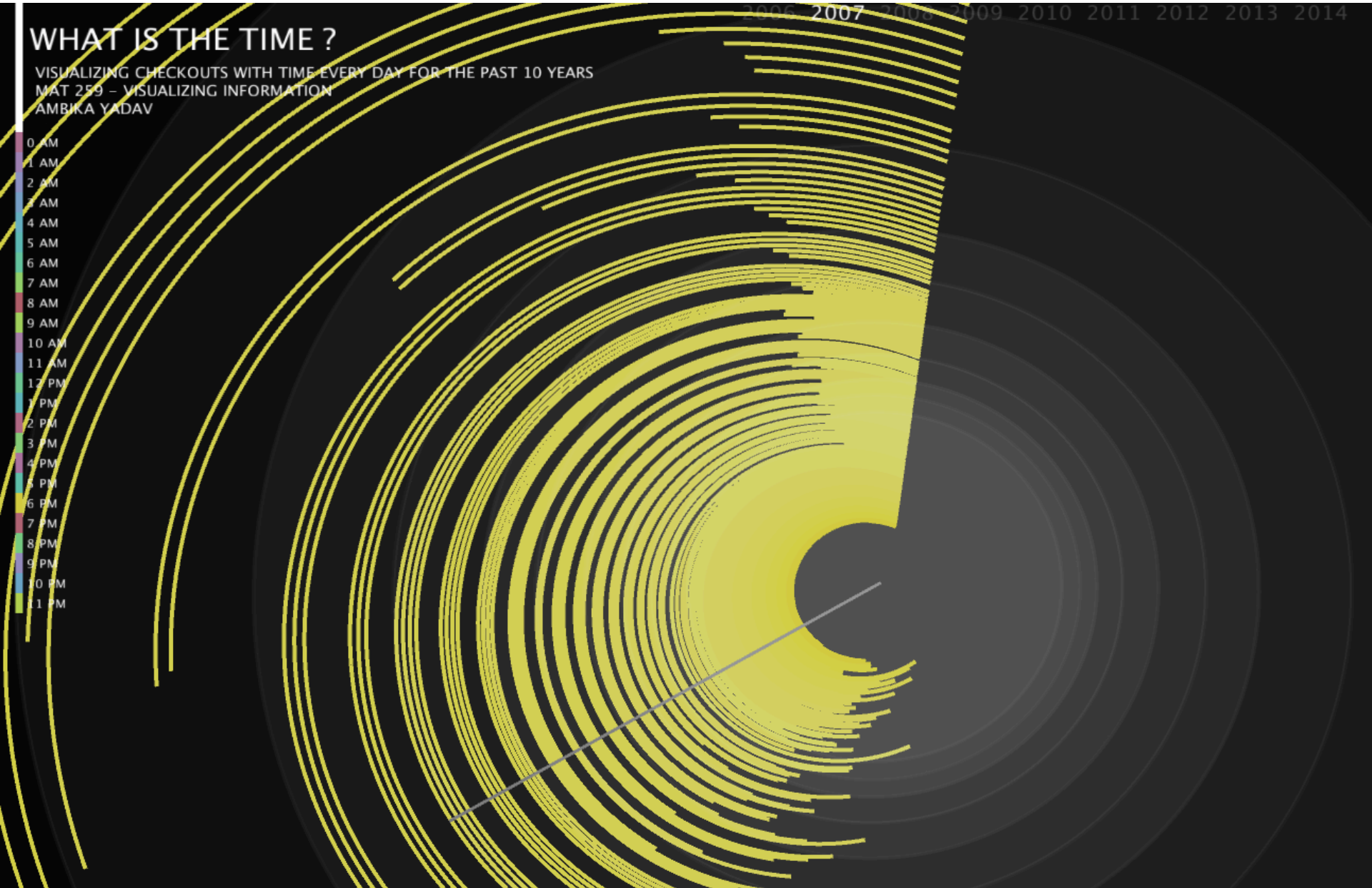
Cultural Trends

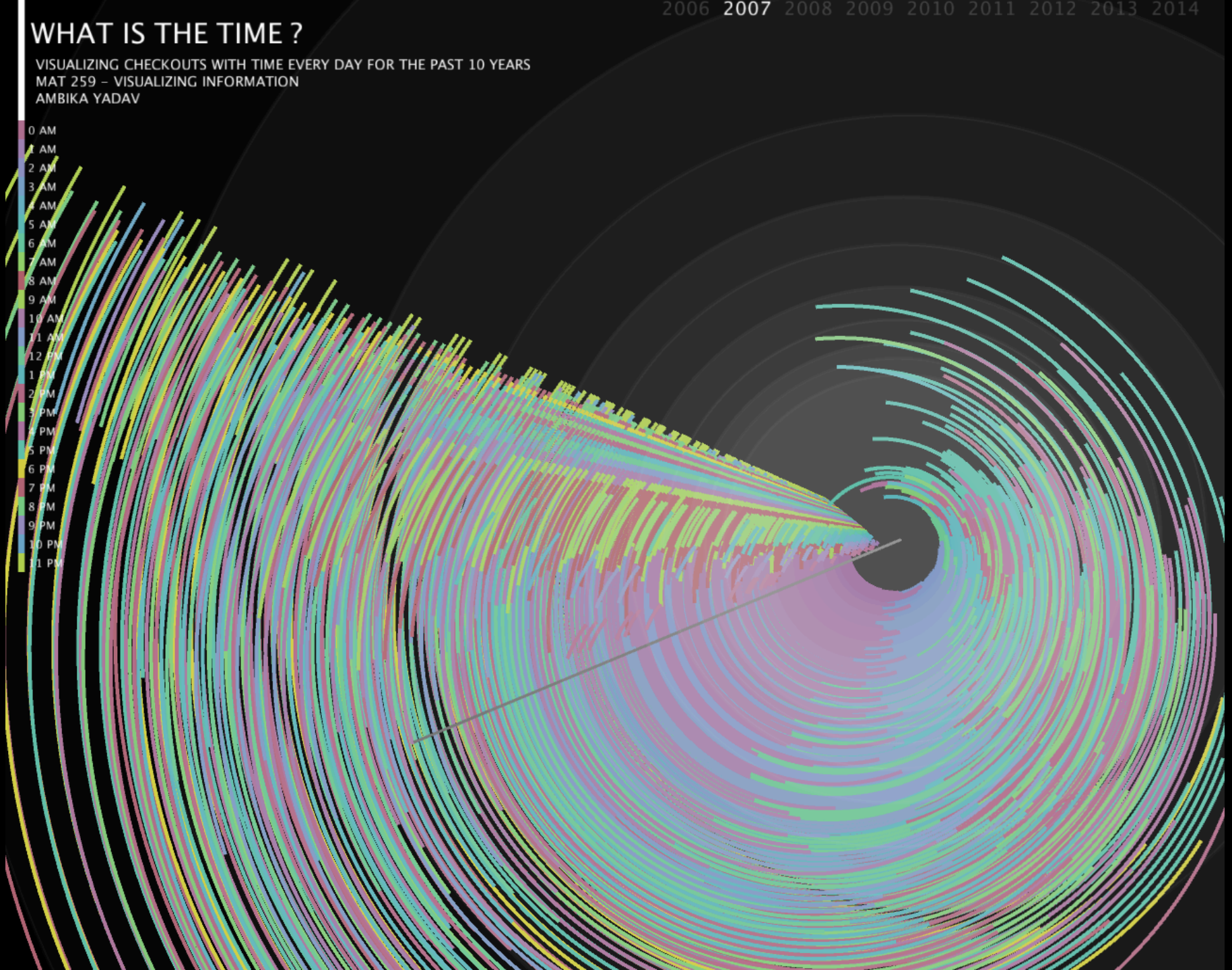


Cultural Trends



Circular Examples



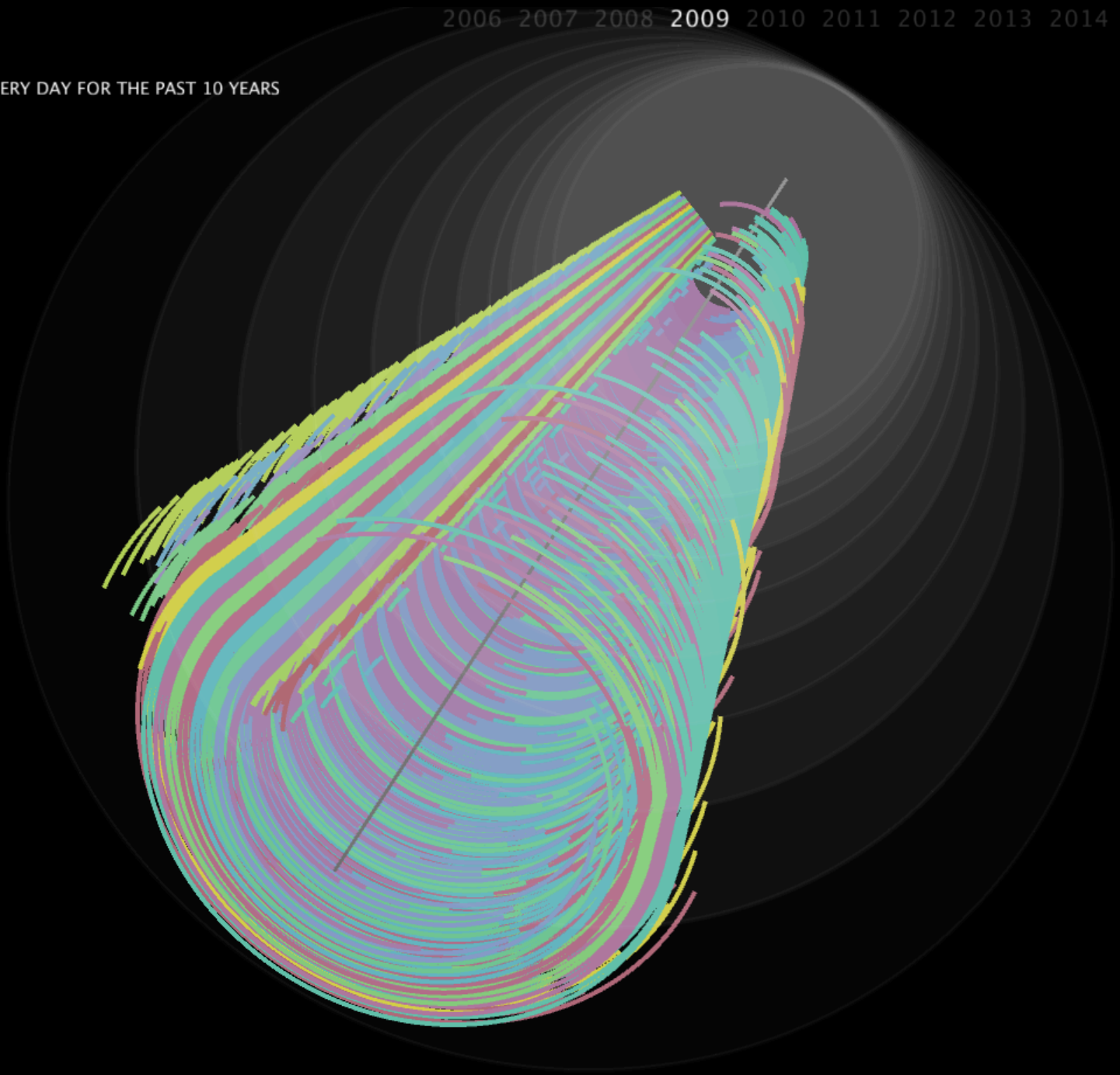

2006 2007 2008 2009 2010 2011 2012 2013 2014
WHAT IS THE TIME ?
VISUALIZING CHECKOUTS WITH TIME EVERY DAY FOR THE PAST 10 YEARS
MAT 259 – VISUALIZING INFORMATION
AMBIKA YADAV
0 AM
1 AM
2 AM
3 AM
4 AM
5 AM
6 AM
7 AM
8 AM
9 AM
10 AM
11 AM
12 PM
1 PM
2 PM
3 PM
4 PM
5 PM
6 PM
7 PM
8 PM
9 PM
10 PM
11 PM

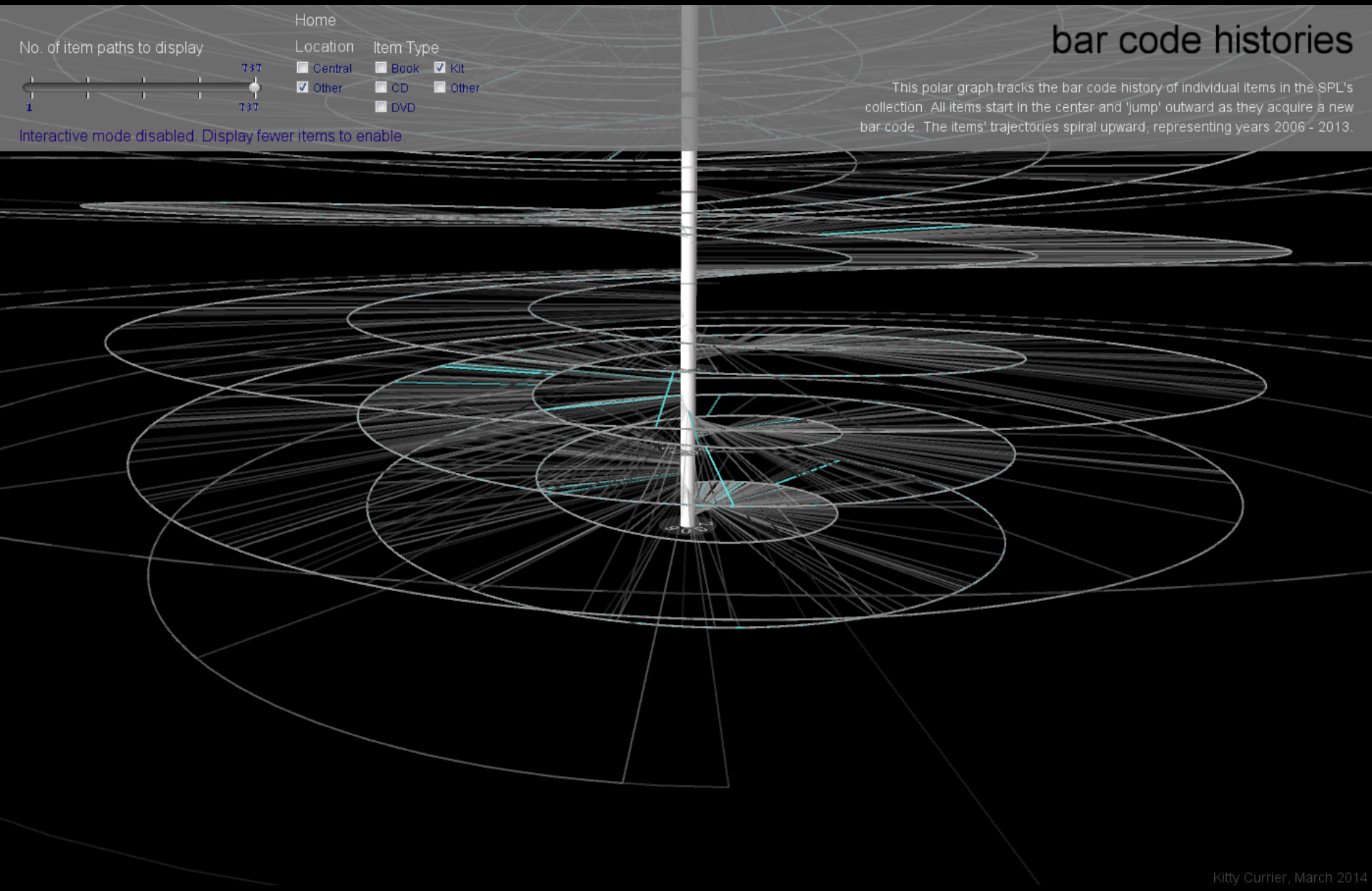
WHAT IS THE TIME ?

VISUALIZING CHECKOUTS WITH TIME EVERY DAY FOR THE PAST 10 YEARS
MAT 259 – VISUALIZING INFORMATION
AMBIKA YADAV

2006 2007 2008 2009 2010 2011 2012 2013 2014

- 0 AM
- 1 AM
- 2 AM
- 3 AM
- 4 AM
- 5 AM
- 6 AM
- 7 AM
- 8 AM
- 9 AM
- 10 AM
- 11 AM
- 12 PM
- 1 PM
- 2 PM
- 3 PM
- 4 PM
- 5 PM
- 6 PM
- 7 PM
- 8 PM
- 9 PM
- 10 PM
- 11 PM




Home
No. of item paths to display
737
1
737
Location
Central
Other
Item Type
Book
CD
DVD
Kit
Other
Interactive mode disabled. Display fewer items to enable.
bar code histories
This polar graph tracks the bar code history of individual items in the SPL's collection. All items start in the center and 'jump' outward as they acquire a new bar code. The items' trajectories spiral upward, representing years 2006 - 2013.
Kitty Currier, March 2014

No. of item paths to display

476

1 737

Home

Location

- [ ] Central
- [ ] Other

Item Type

- [ ] Book
- [x] Kit
- [ ] Other
- [ ] CD
- [ ] DVD

Interactive mode disabled. Display fewer items to enable.

bar code histories

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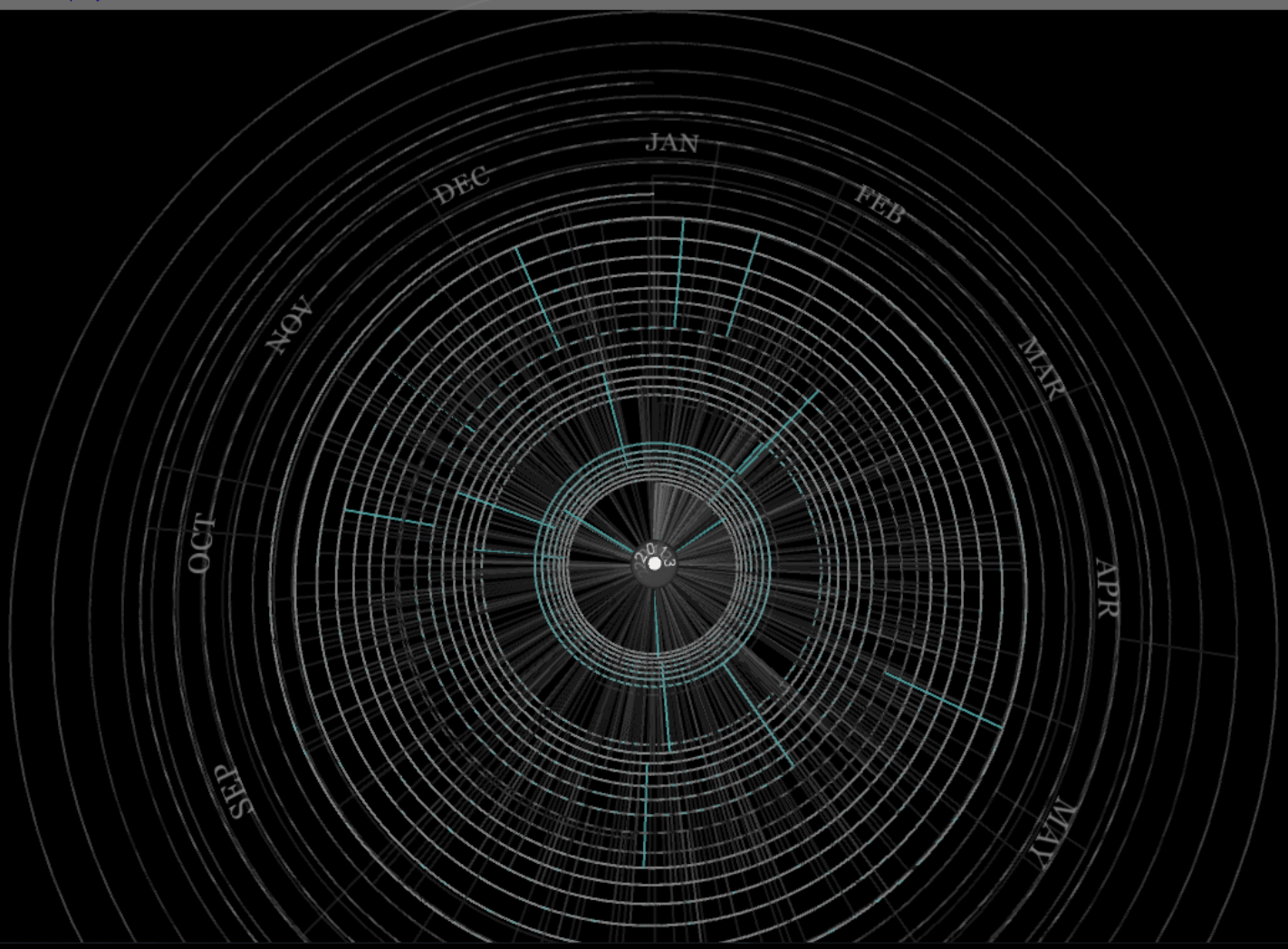
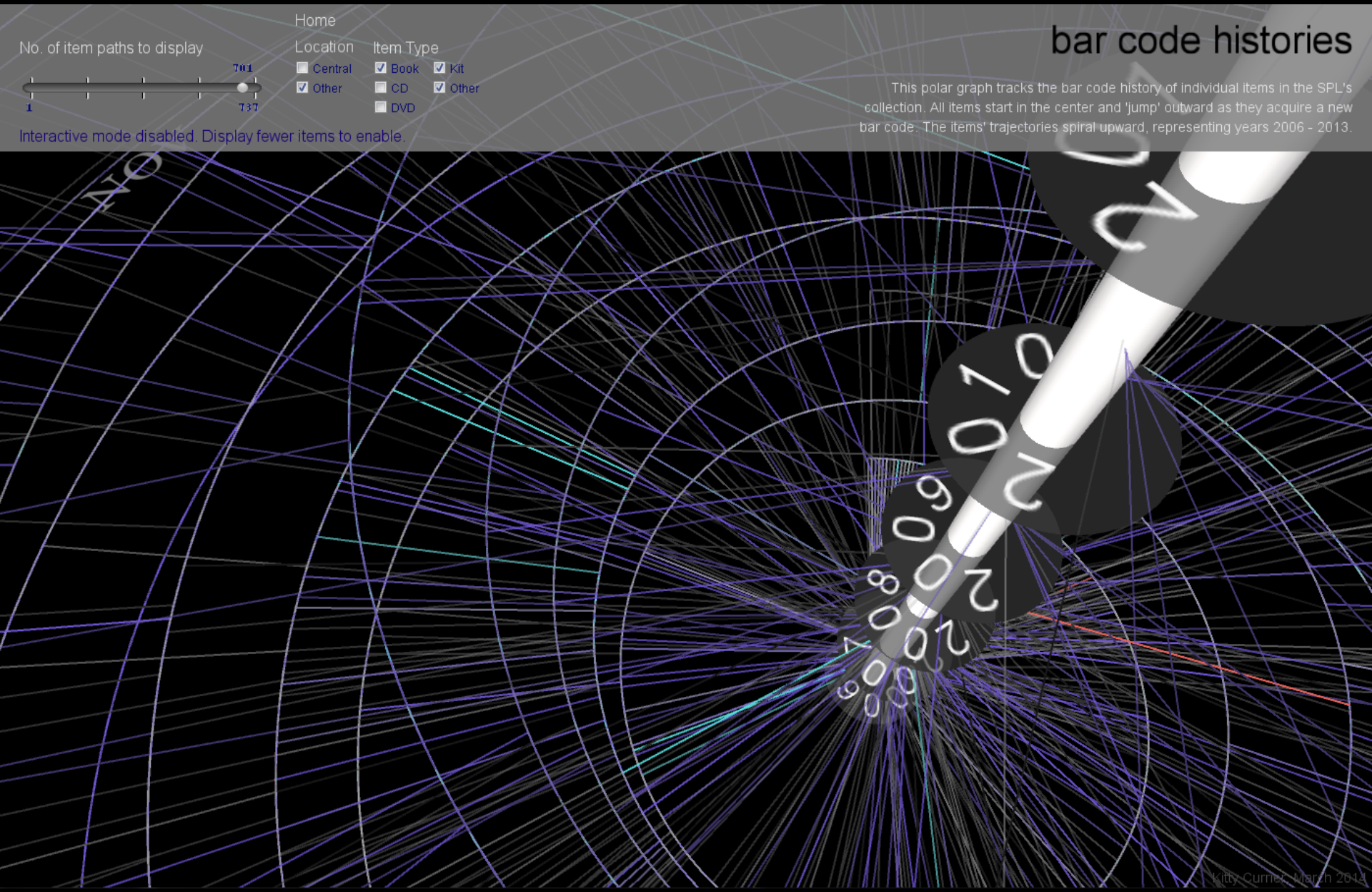


Kitty Currier, March 2014


Home
No. of item paths to display
701
1
737
Location
Central
Other
Item Type
Book
CD
DVD
Kit
Other
Interactive mode disabled. Display fewer items to enable.
bar code histories
This polar graph tracks the bar code history of individual items in the SPL's collection. All items start in the center and 'jump' outward as they acquire a new bar code. The items' trajectories spiral upward, representing years 2006 - 2013.
2006
2007
2008
2009
2010
2011
2012
2013
Kitty Currier, March 2013

Earth

Data mining from Seattle Public Library 2005-2011

Dewey Class Color

000 - 99 : Information & Computer Science
100 - 199 : Philosophy & Psychology
200 - 299 : Religion
300 - 349 : Social Sciences
350 - 399 : Social Sciences
400 - 449 : Languages
450 - 499 : Languages
500 - 599 : Science & Mathematics
600 - 699 : Technology & Applied Science
700 - 799 : Arts & Recreation
800 - 899 : Literature
900 - 999 : History & Geography & Biography

Press key 1-5
1 : Full sphere, 2 : Lines, 3: Spheres
4: Spheres with Dates text, 5: Book title texts

MAT259, Data Visualization
Final Project: 3D Visualization
By Yoon Chung Han

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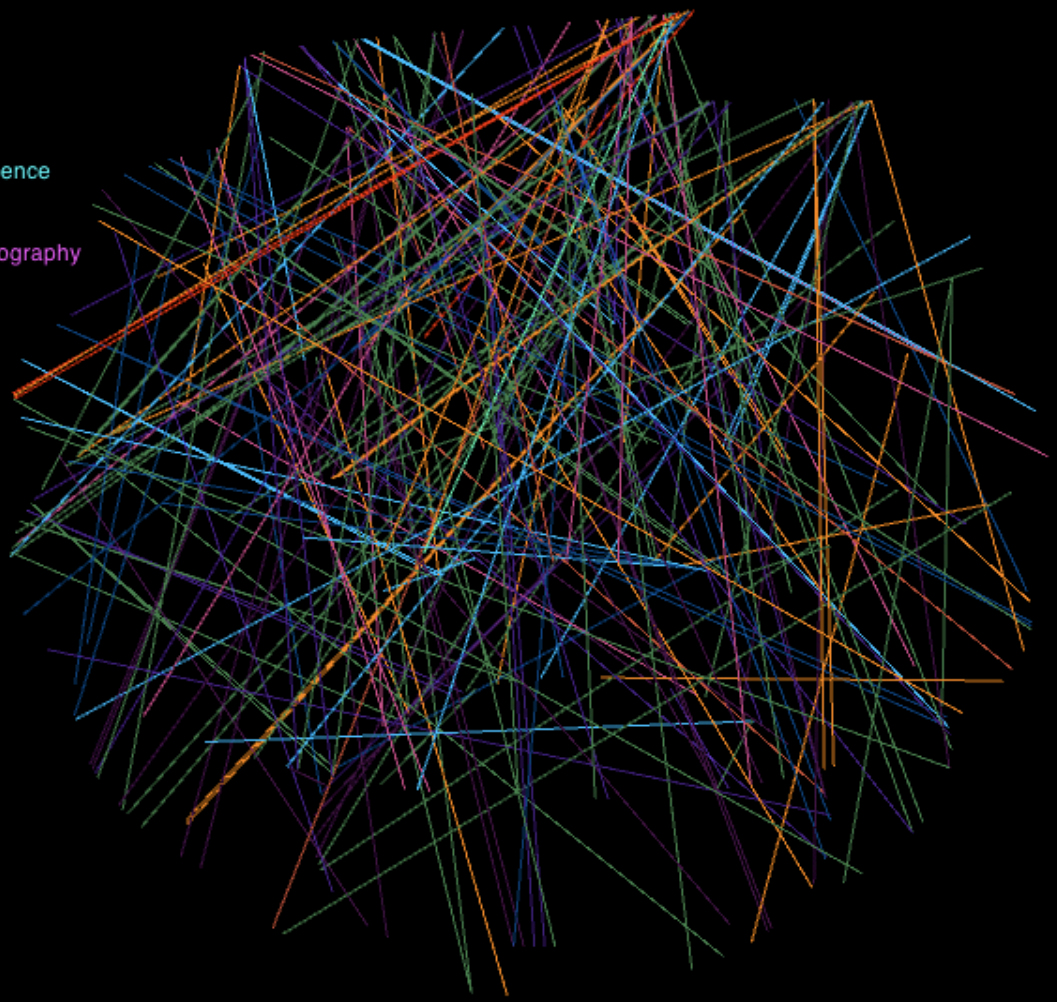

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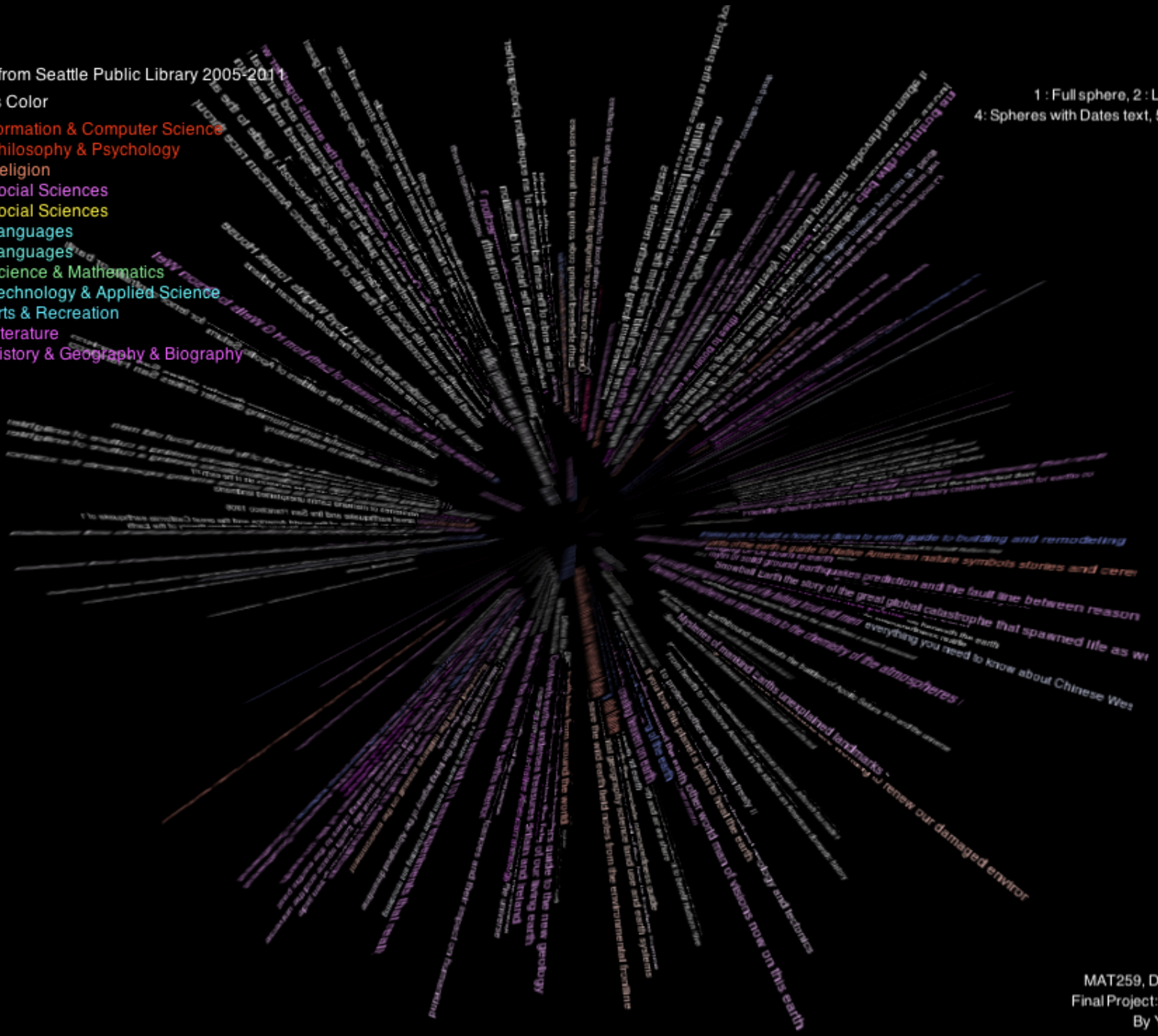

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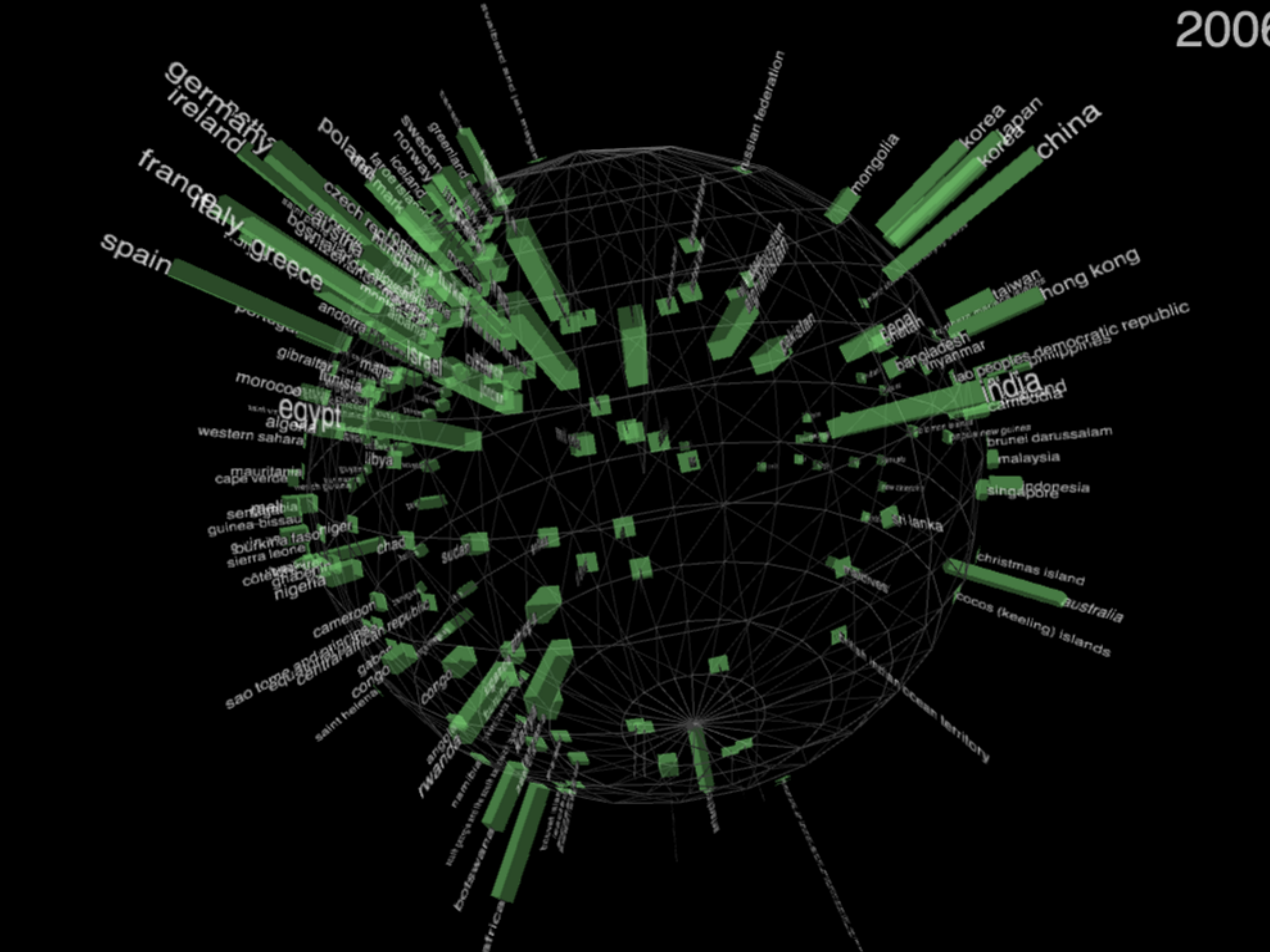

germany
ireland
poland
sweden
norway
iceland
denmark
faroe islands
greenland
russian federation
mongolia
korea
japan
korea
china
france
italy
spain
greece
austria
czech republic
hungary
romania
portugal
andorra
israel
gibraltar
malta
tunisia
morocco
egypt
algeria
western sahara
libya
mauritania
cape verde
senegal
guinea-bissau
burkina faso
niger
sierra leone
chad
sudan
nigeria
cameroon
central african republic
sao tome and principe
gabon
congo
congo
saint helena
angola
rwanda
namibia
botswana
pakistan
nepal
bhutan
bangladesh
myanmar
taiwan
hong kong
lao peoples democratic republic
philippines
india
cambodia
papua new guinea
brunei darussalam
malaysia
indonesia
singapore
sri lanka
maldives
christmas island
australia
cocos (keeling) islands

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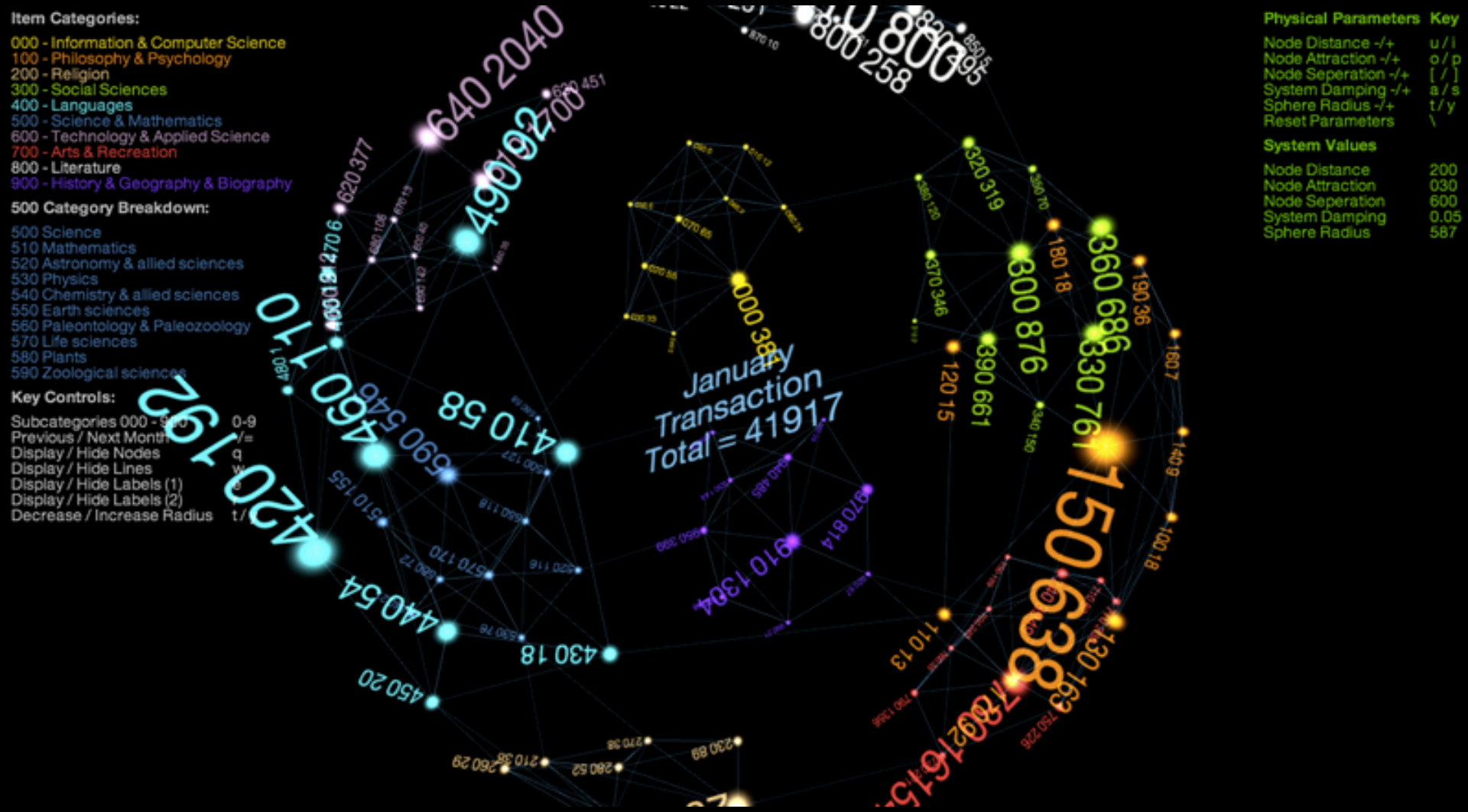
Dewey Category Breakdown:

000 Computer science & Information
010 Bibliographies
020 Library & information sciences
030 Encyclopedias & books of facts
040 [Unassigned]
050 Magazines, journals & serials
060 Associations, organizations & museums
070 News media, journalism & publishing
080 Quotations
090 Manuscripts & rare books


Item Categories:
000 - Information & Computer Science
100 - Philosophy & Psychology
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400 - Languages
500 - Science & Mathematics
600 - Technology & Applied Science
700 - Arts & Recreation
800 - Literature
900 - History & Geography & Biography
500 Category Breakdown:
500 Science
510 Mathematics
520 Astronomy & allied sciences
530 Physics
540 Chemistry & allied sciences
550 Earth sciences
560 Paleontology & Paleozoology
570 Life sciences
580 Plants
590 Zoological sciences
Key Controls:
Subcategories 000 - 900 0-9
Previous / Next Month /=
Display / Hide Nodes q
Display / Hide Lines w
Display / Hide Labels (1) e
Display / Hide Labels (2)
Decrease / Increase Radius t /
January
Transaction
Total = 41917
Physical Parameters Key
Node Distance -/+ u / i
Node Attraction -/+ o / p
Node Seperation -/+ [/]
System Damping -/+ a / s
Sphere Radius -/+ t / y
Reset Parameters \
System Values
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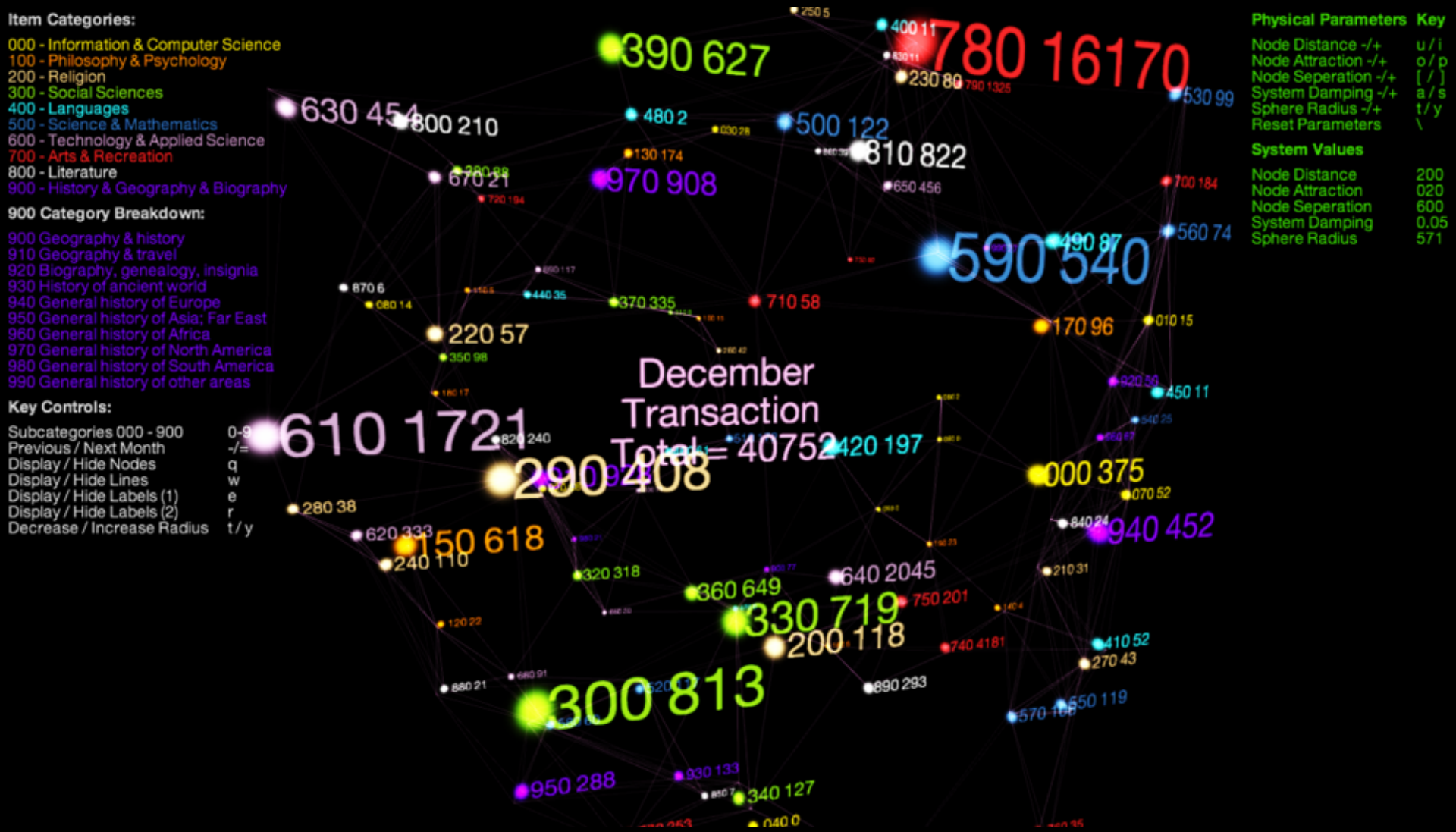
Node Attraction 030
Node Seperation 600
System Damping 0.05
Sphere Radius 587


Item Categories:
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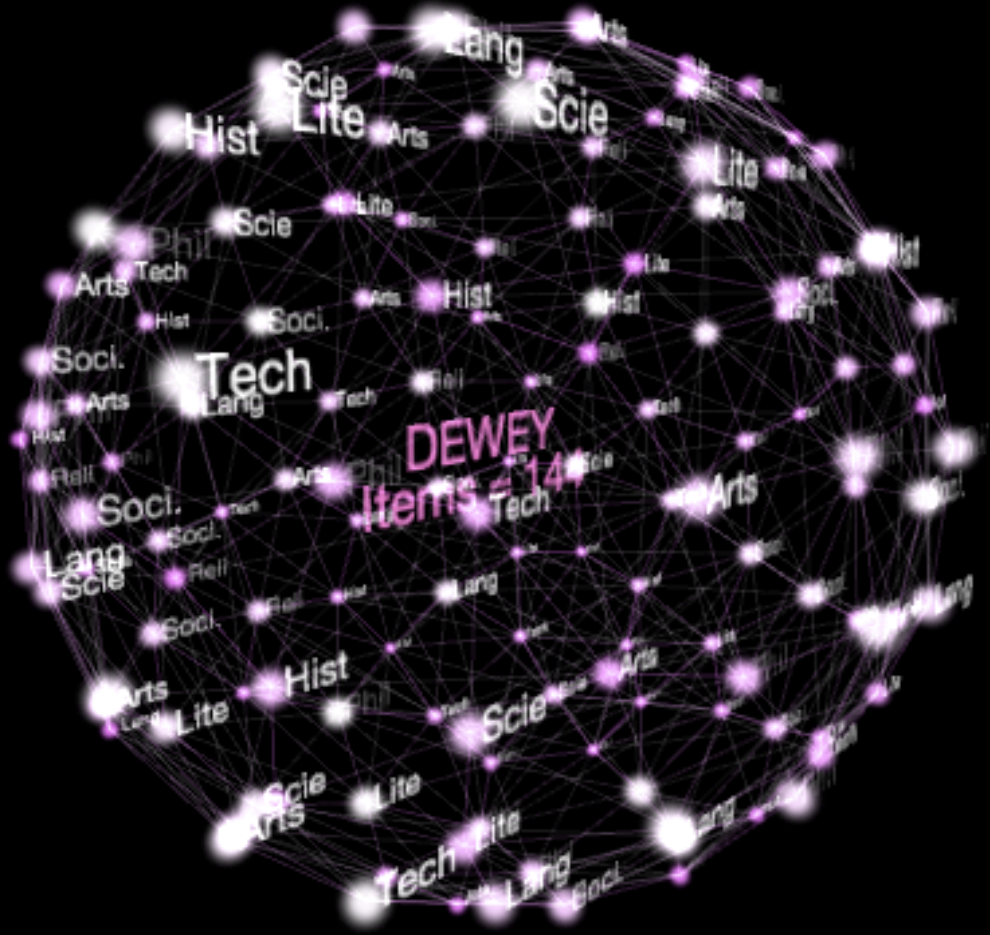
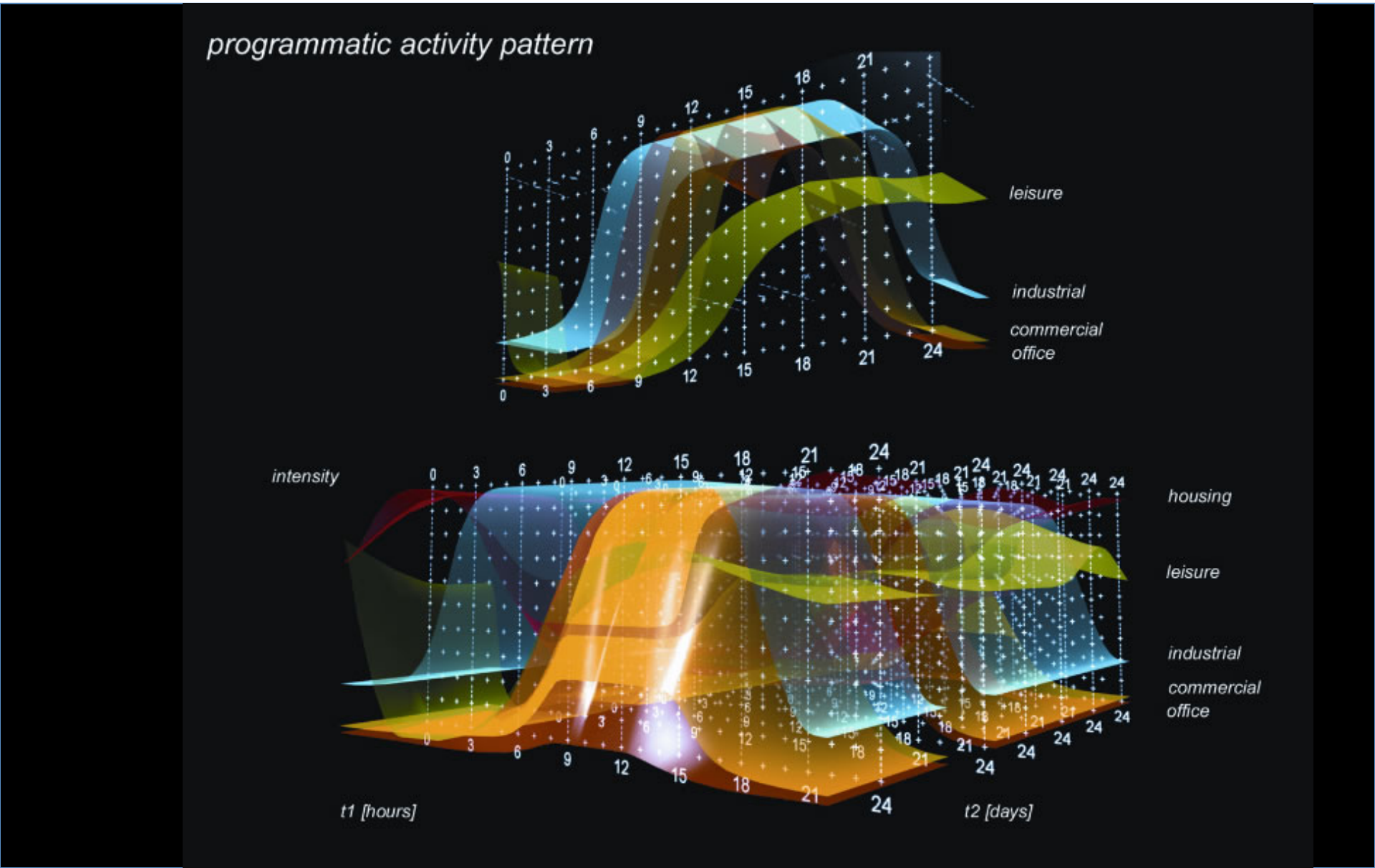
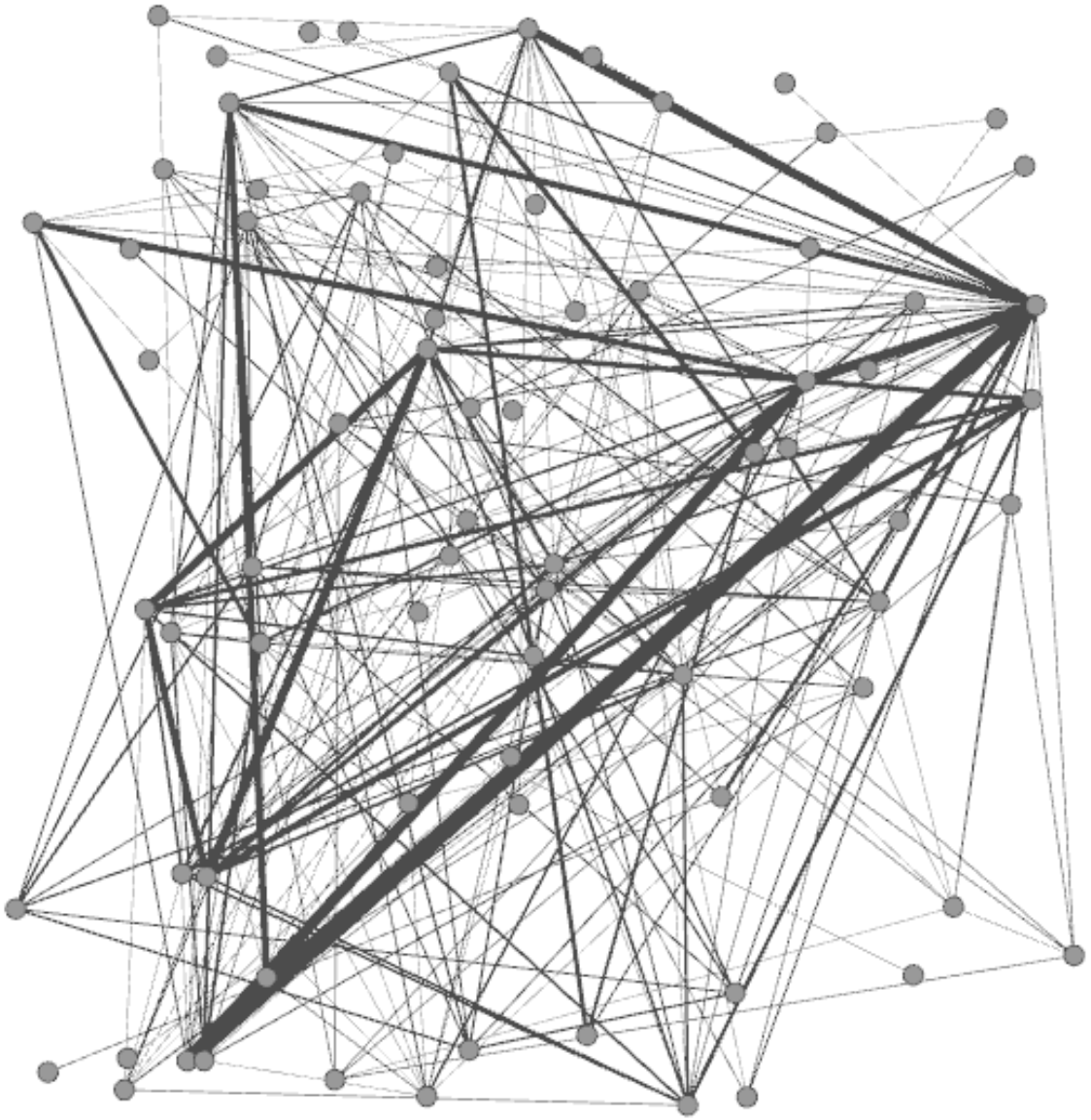
200 - Religion
300 - Social Sciences
400 - Languages
500 - Science & Mathematics
600 - Technology & Applied Science
700 - Arts & Recreation
800 - Literature
900 - History & Geography & Biography
900 Category Breakdown:
900 Geography & history
910 Geography & travel
920 Biography, genealogy, insignia
930 History of ancient world
940 General history of Europe
950 General history of Asia; Far East
960 General history of Africa
970 General history of North America
980 General history of South America
990 General history of other areas
Key Controls:
Subcategories 000 - 900 0-9
Previous / Next Month -/=
Display / Hide Nodes q
Display / Hide Lines w
Display / Hide Labels (1) e
Display / Hide Labels (2) r
Decrease / Increase Radius t / y
December
Transaction
Total = 40752
780 16170
390 627
630 454
800 210
480 2
500 122
810 822
970 908
590 540
610 1721
290 408
300 813
330 719
150 618
940 452
000 375
220 57
710 58
370 335
200 118
640 2045
360 649
320 318
Physical Parameters Key
Node Distance -/+ u / i
Node Attraction -/+ o / p
Node Seperation -/+ [/]
System Damping -/+ a / s
Sphere Radius -/+ t / y
Reset Parameters \
System Values
Node Distance 200
Node Attraction 020
Node Seperation 600
System Damping 0.05
Sphere Radius 571


DEWEY
Items
Lang
Scie
Lite
Hist
Arts
Tech
Soci.
Phil
Reli

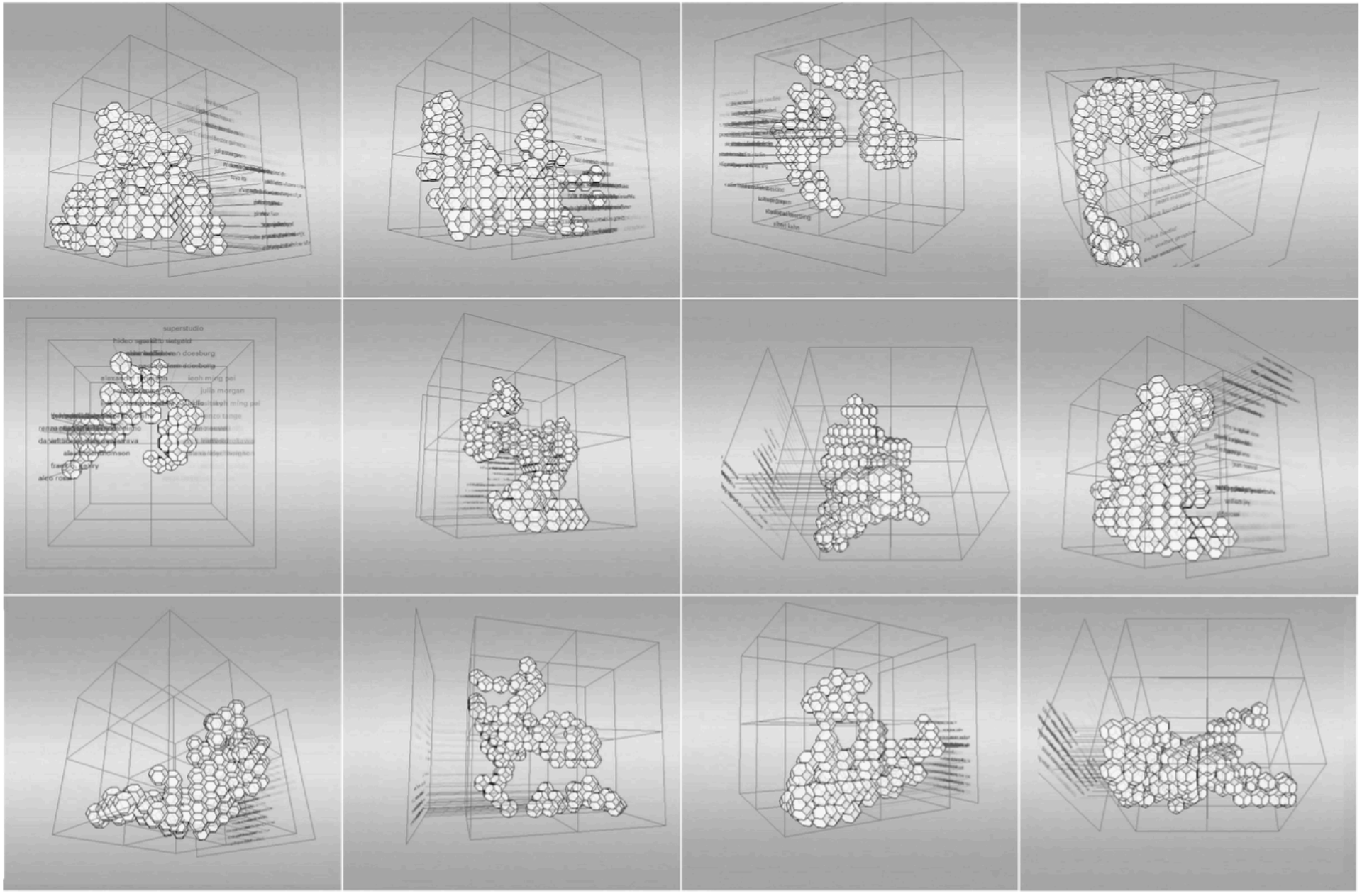
Labeling: How much?



Nodes

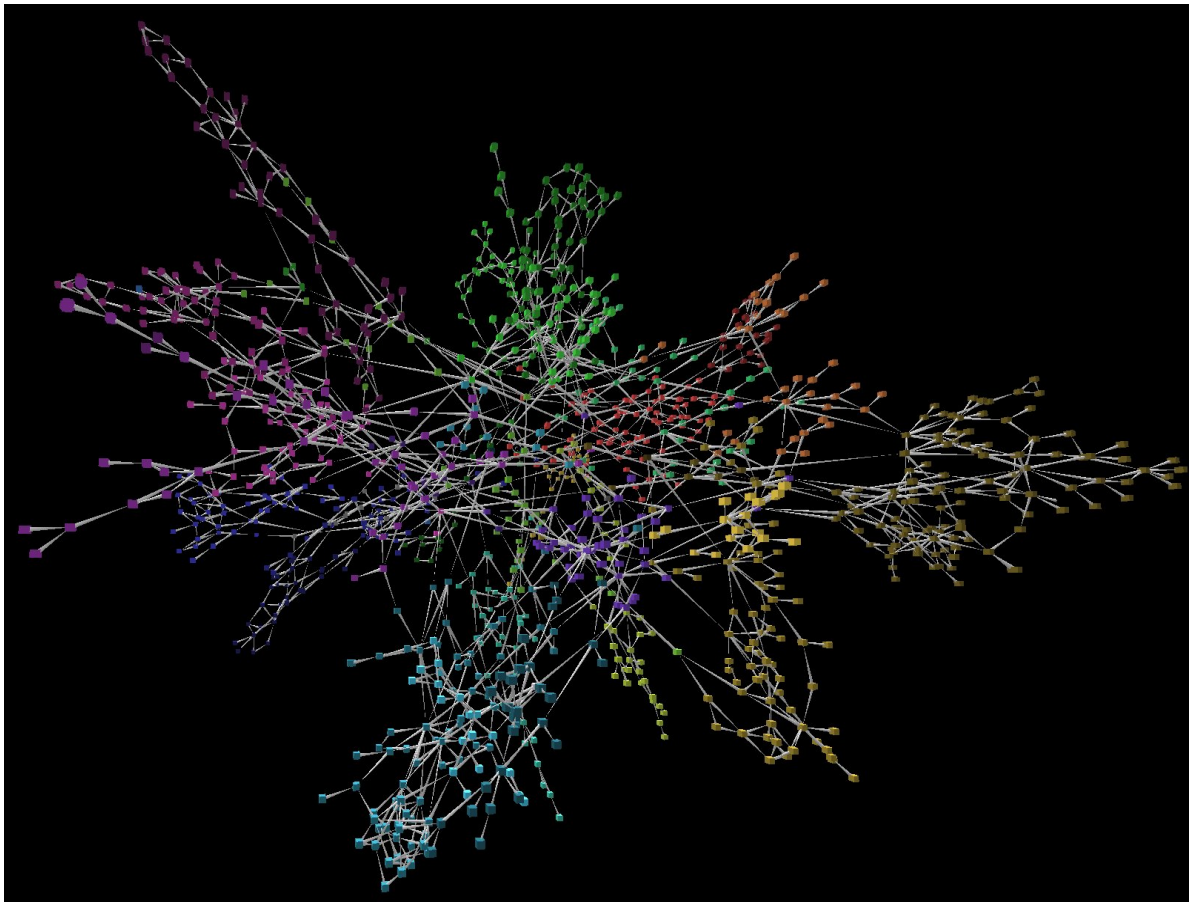


Cuboctahedrons interConnected Nodes



Nodes & Links

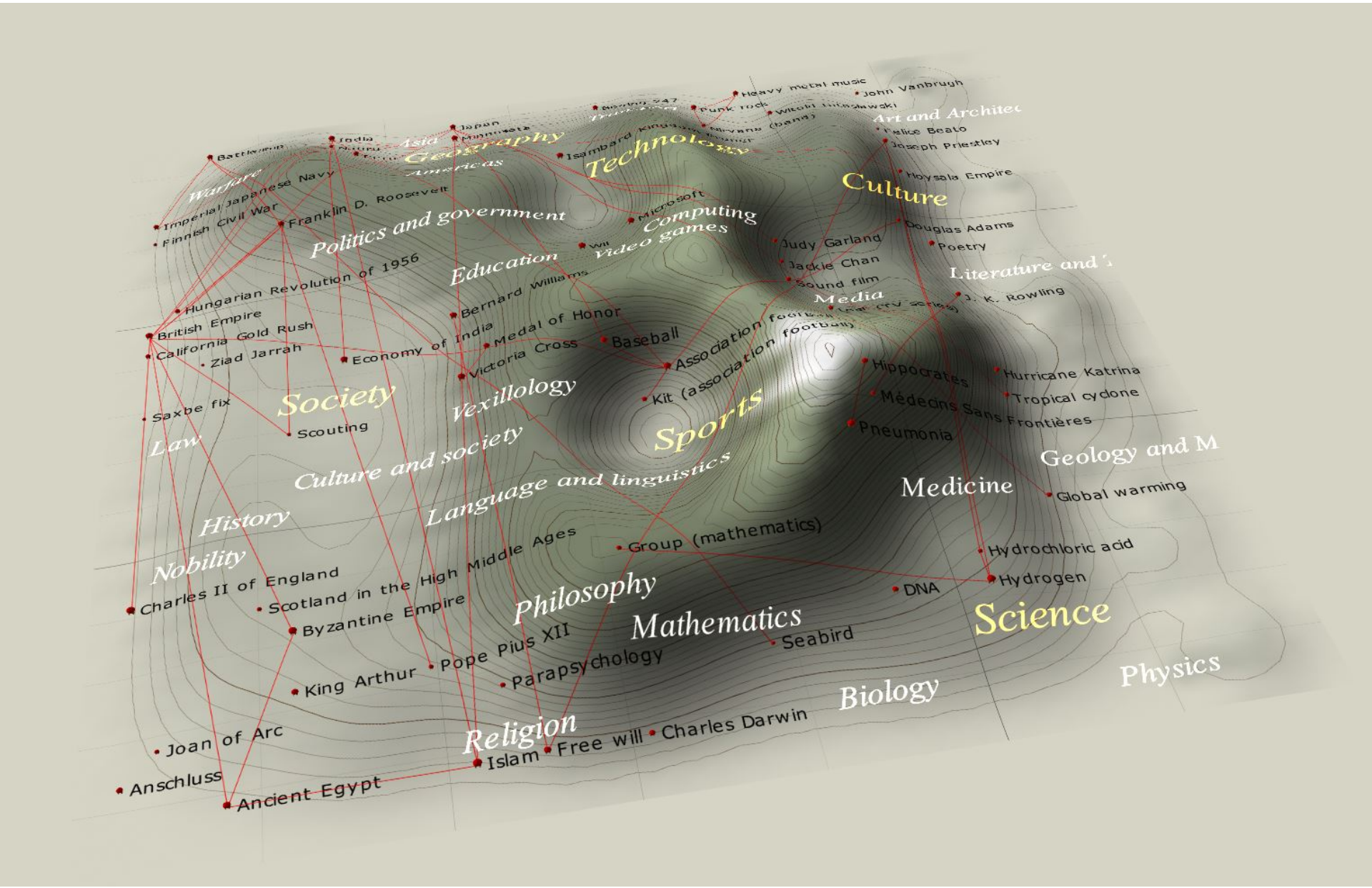
Can be top down hierarchical, or independent, spatially distributed and clustered to highlight relationships



Data Mapping

- **Literal** – one-to-one relation from data to pixel
- **Adjust proximal placement**:
  - Statistical, mean, average, etc.
  - Self-organizing map algorithm (Kohonen, neural network)

Self-Organizing Map: Proximity based on metadata



Recommendations

- Let the data define the shape of the outcome
- Do not use pre-existing, predetermining forms (like a map)
- The data needs to be granular (detailed) to get interesting results