VISUALIZATION WORKSHOP

Amit Chourasia

Visualization Services Group

San Diego Supercomputer Center, UCSD

AGENDA

01:30pm – 02:15pm	**SESSION 1A:**	Information visualization (Lecture) Motivation for visualization Assay of Techniques and their Application
02:15pm – 03:30pm	**SESSION 1B:**	Scientific visualization (Lecture) Assay of Techniques Application Use Cases Best Practices
03:00pm – 03:30pm	**Q&A, BREAK**	
03:30pm – 04:45pm	**SESSION 2:**	Visualization with VisIt (Hands on)
04:45pm – 05:00pm	**Q & A, Adjourn**	

Be Prepared for Session 2: Visualization Hands On

Make sure you have

VisIt (2.5.2*): http://visit.llnl.gov/executables.html

***Preferred version**

Sample Data: Unzip sample data to your Desktop

https://wci.llnl.gov/codes/visit/2.3.0/VisItClassData.zip

Sphere Data http://users.sdsc.edu/~amit/forums/sphere.zip

TUTORIAL GOALS

Session 1

Visualization concepts

Visualization use cases

Best practices in visualization

Strengths and limitation of visualization

Introduction to VisIt software – Perform basic tasks in VisIt

Session 2

Perform Basic and Intermediate tasks with VisIt

Remote visualization with VisIt on Gordon

SESSION 1A: INFORMATION VISUALIZATION

VIZ MISCONCEPTIONS

- I am not an artist thus can't do viz
- Viz is an art, not science or engineering
- Viz is a one-time task
- Viz is useful only for communication
- Viz SU's are insignificant

Why should you care about visualization?

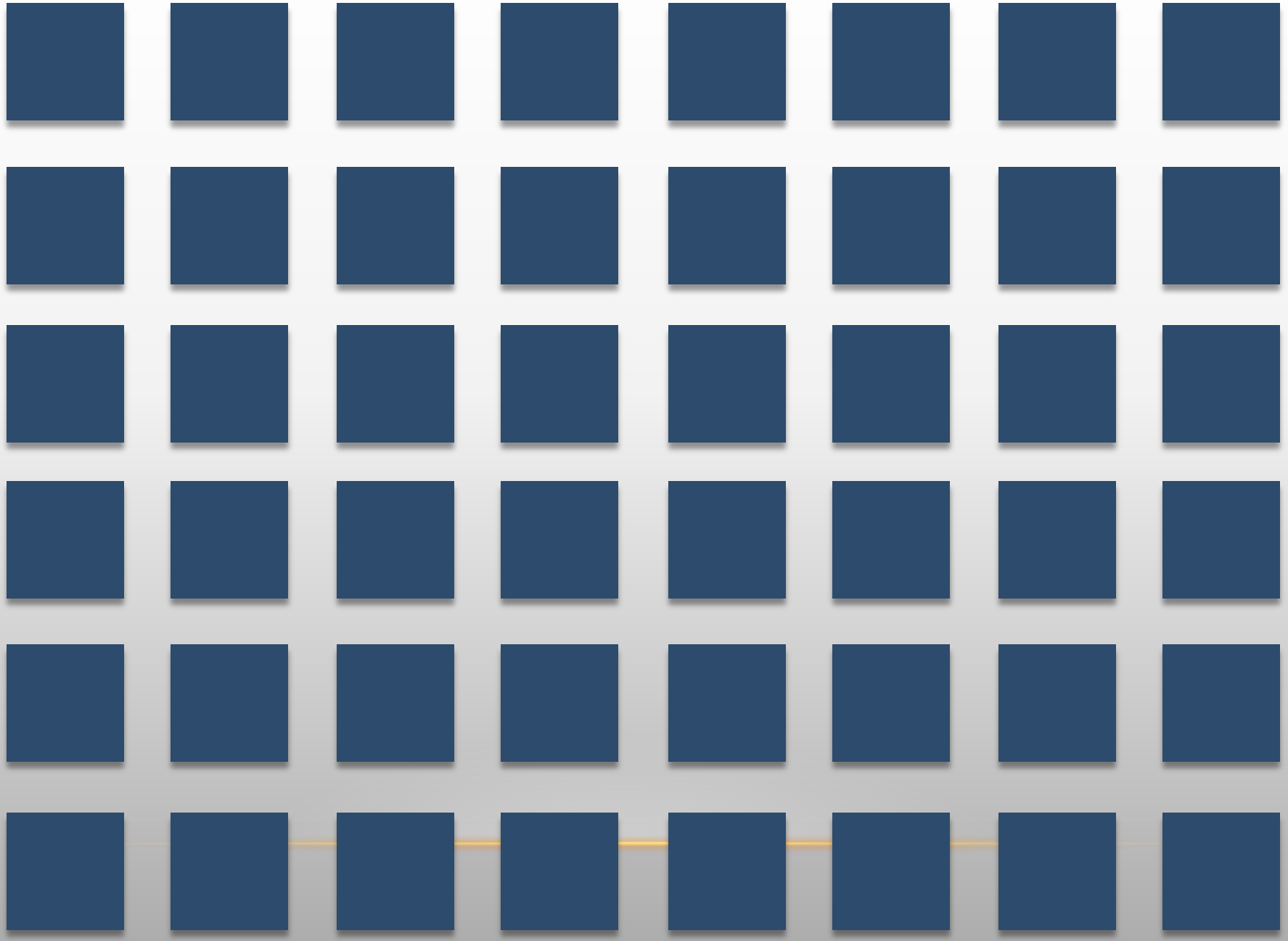
HOW MANY 3'S IN FIRST 350 NUMBERS OF PI?

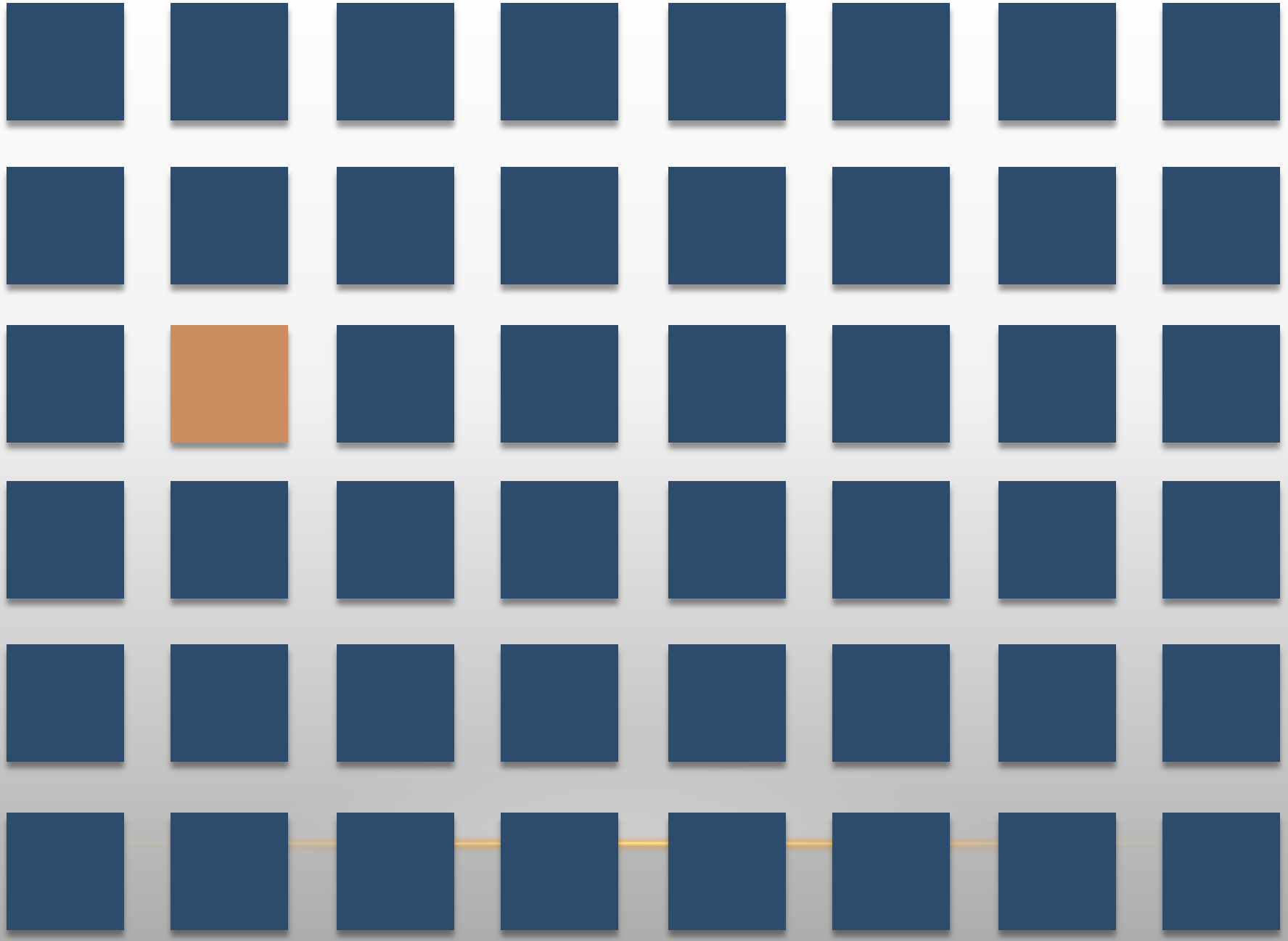
3.14159265358979323846264338327950288419716939937510582097494459230781640628620
89986280348253421170679821480865132823066470938446095505822317253594081284811174
50284102701938521105559644622948954930381964428810975665933446128475648233786
78316527120190914564856692346034861045432664821339360726024914127372458700660631
5588174881520920962829254091715364 3

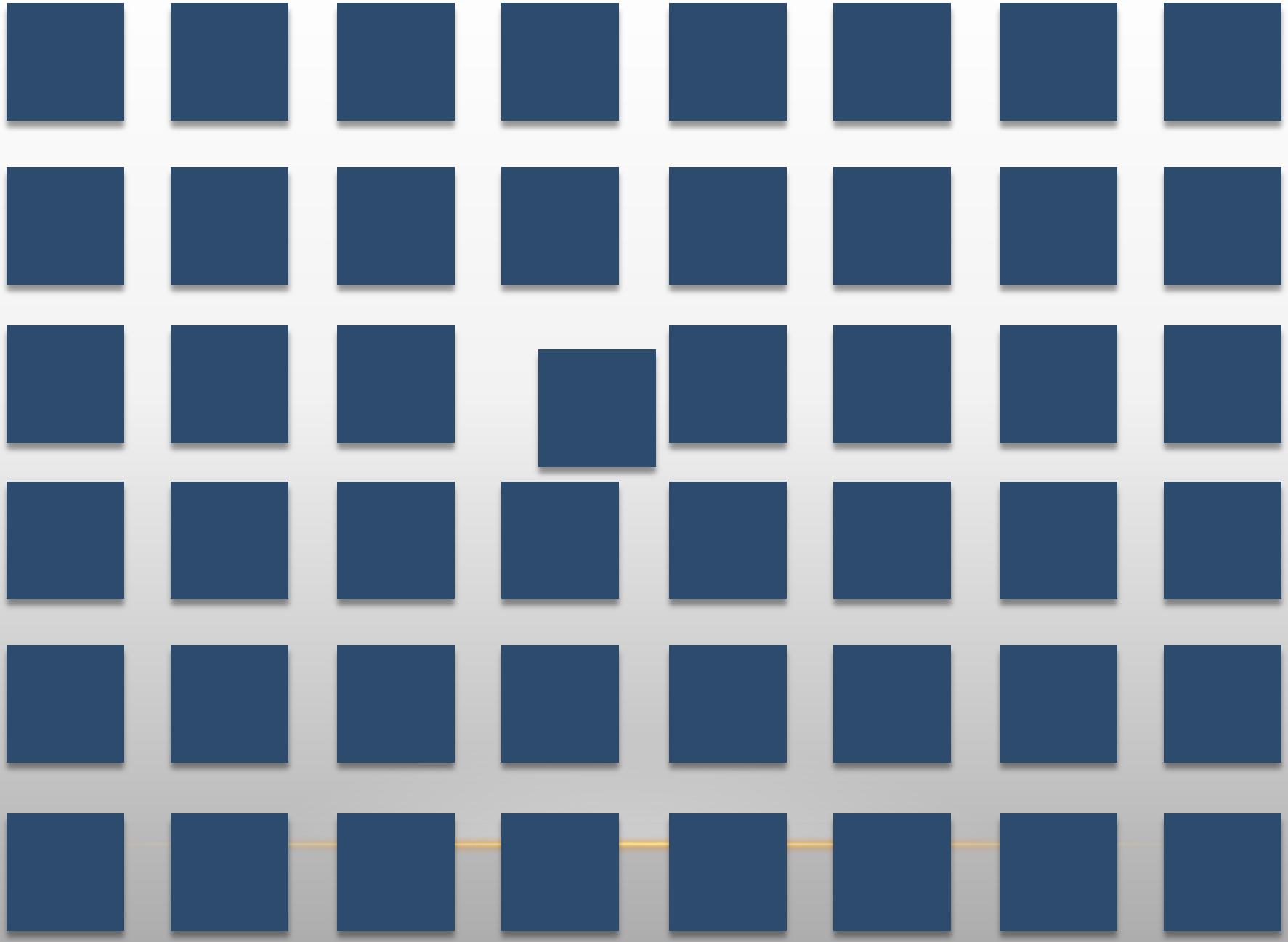
HOW MANY 3'S IN FIRST 350 NUMBERS OF PI?

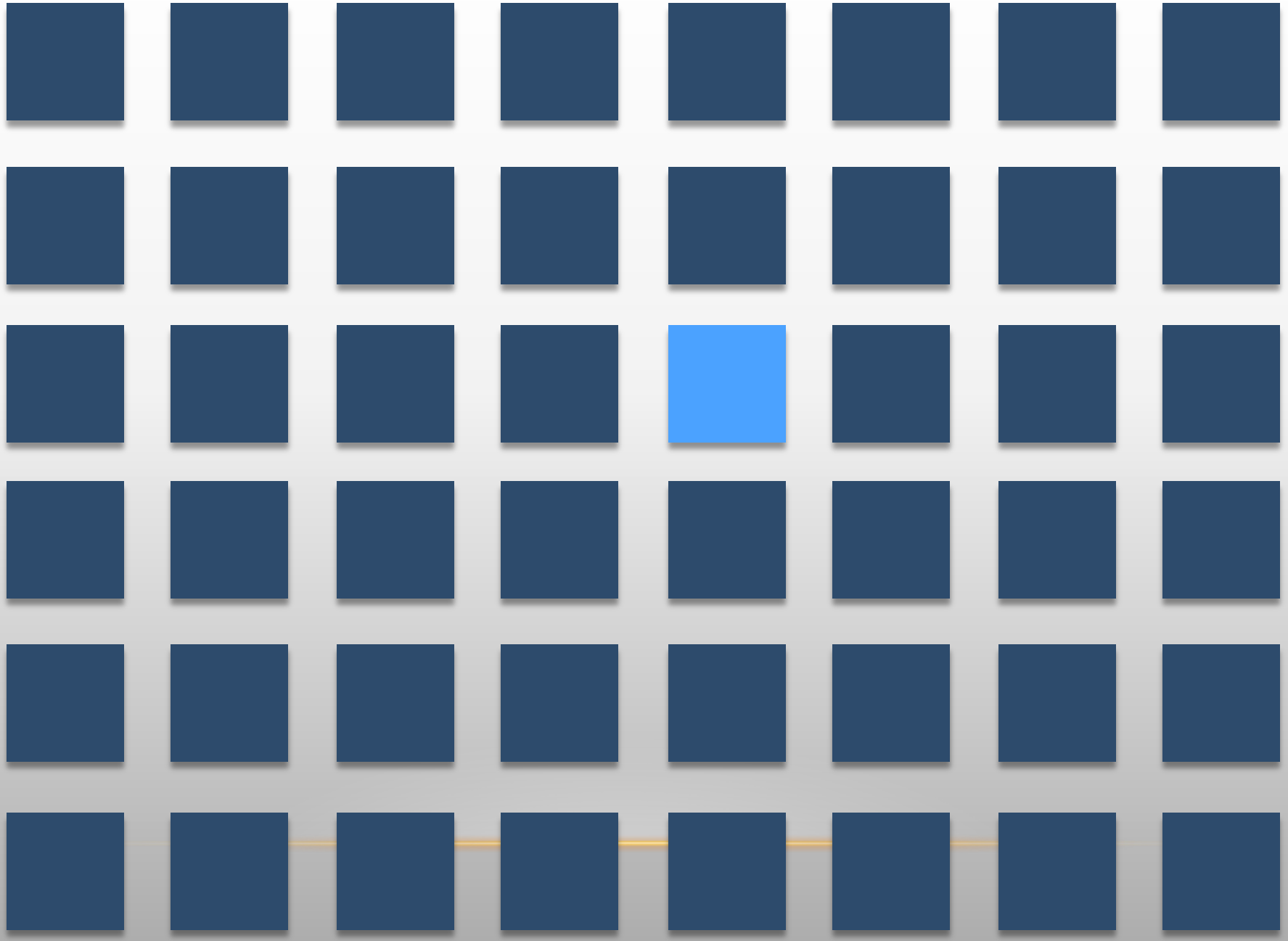
3.14159265358979323846264338327950288419716939937	8
5105820974944592307816406286208998628034825342211	3
706798214808651328230664709384460955058223172535	5
940812848111745028410270193852110555964462294895	3
493038196442881097566593344612847564823378678316	4
527120190914564856692346034861045432664821339360	6
726024914127372458700660631558817488152092096282	2
92540917153643	2

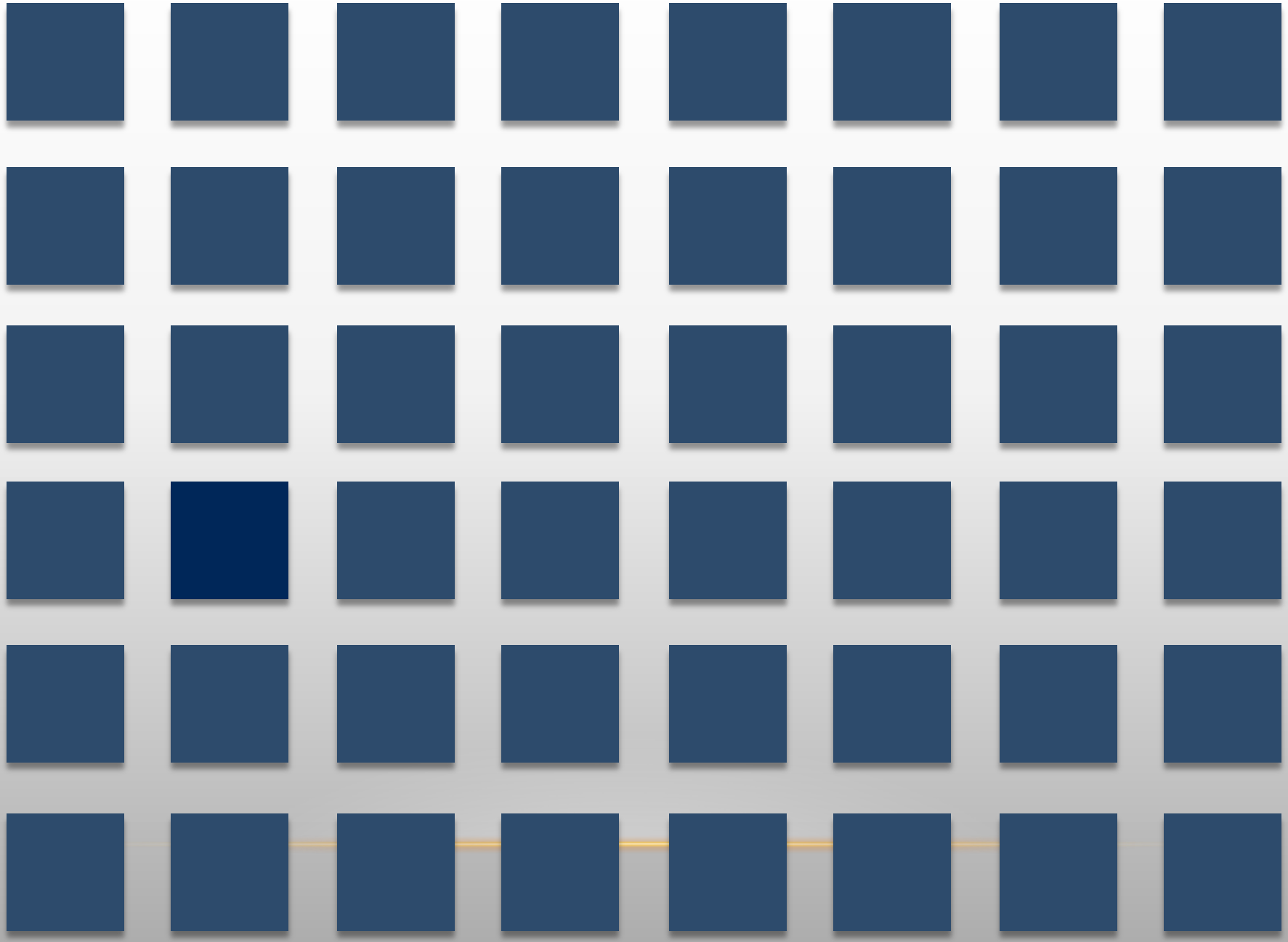
Total 33

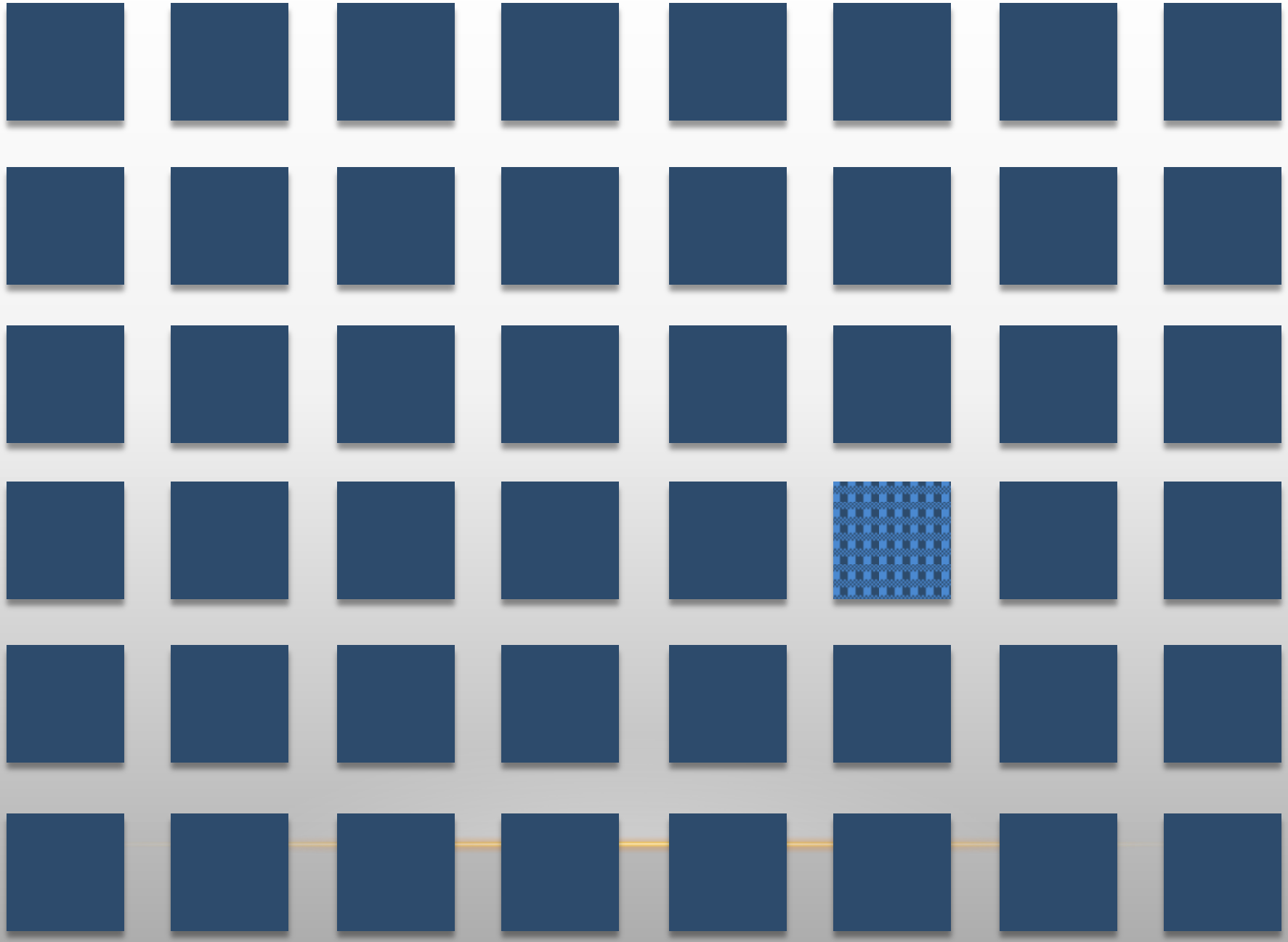


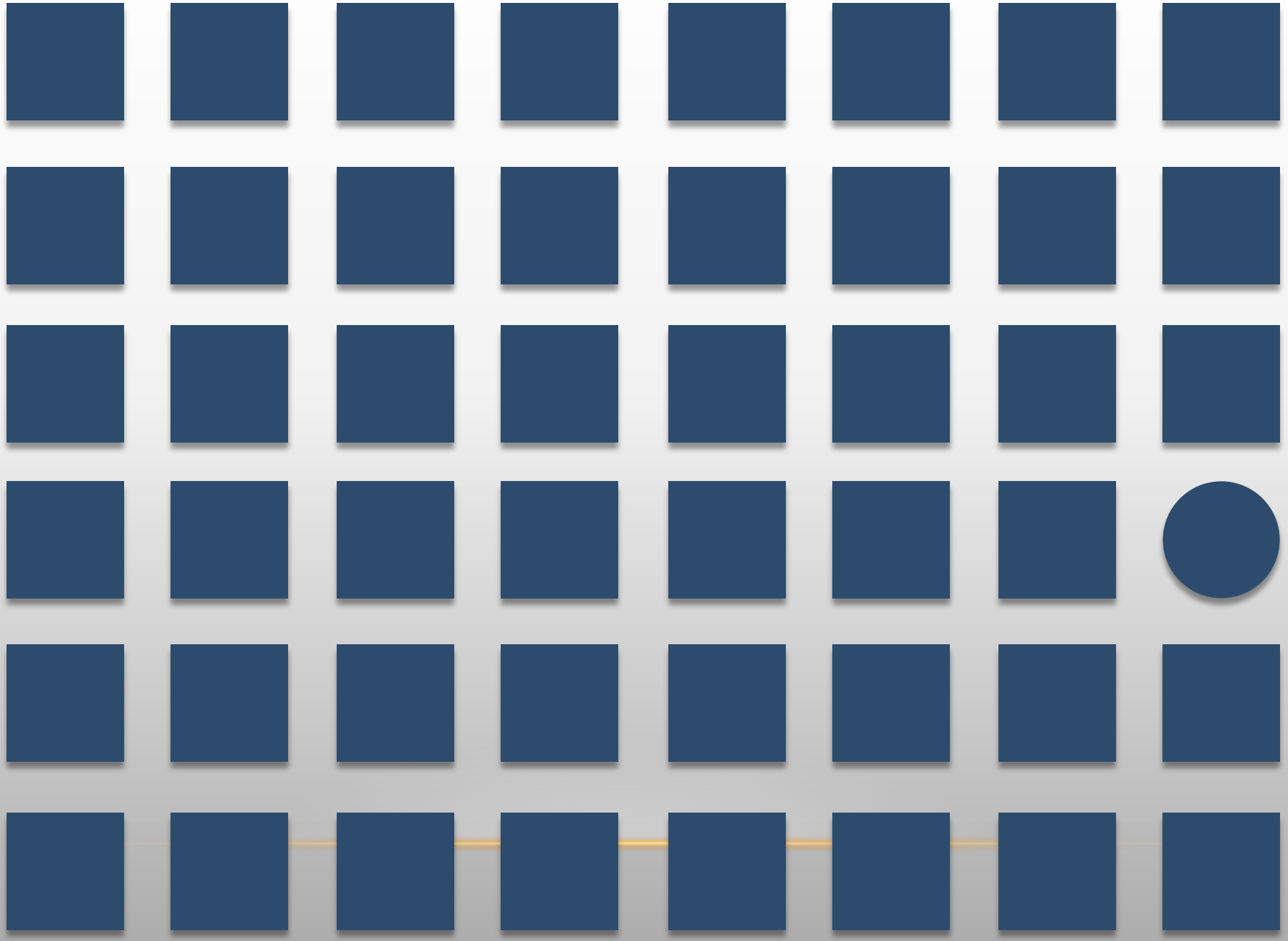












What did you observe?

PREATTENTIVE PROCESSING

Unconsciously gathering information from the environment

Preattentive Attributes(partial list):

position, orientation, scale

color, brightness, saturation

shape, texture

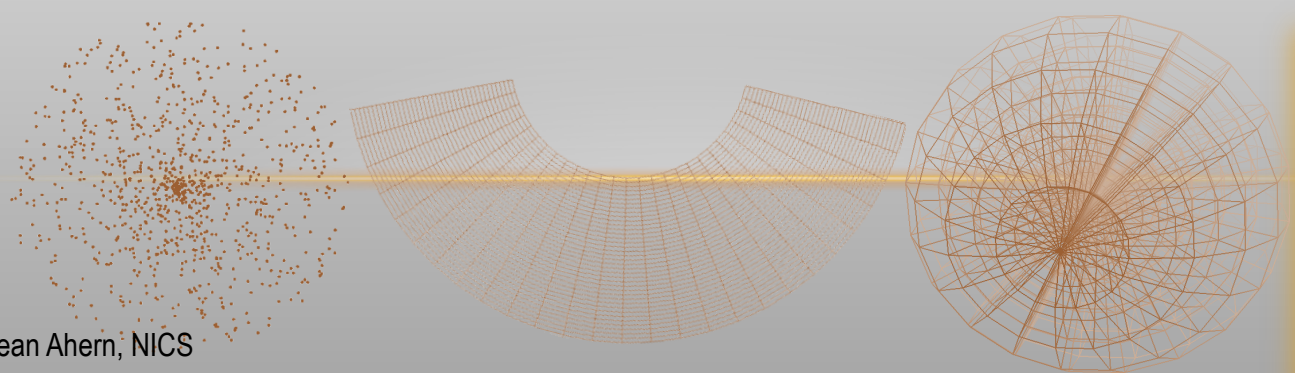
WHAT IS VISUALIZATION?

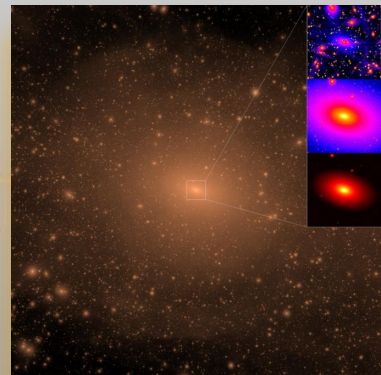
Working Definition

Encoding/mapping **data** into a visual representation to gain/extract insights

DATA

- Text (ASCII or Binary)
- Images (confocal microscopy, satellite imagery)
- High Dimensional (structured and Unstructured)
- Mesh discretizes space into points and cells -1D, 2D, 3D

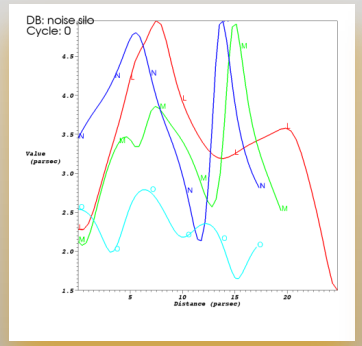


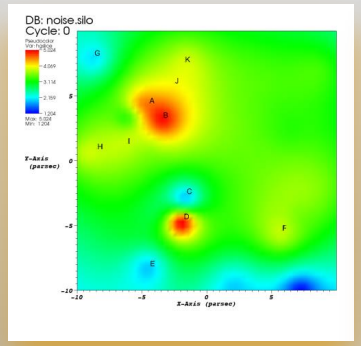


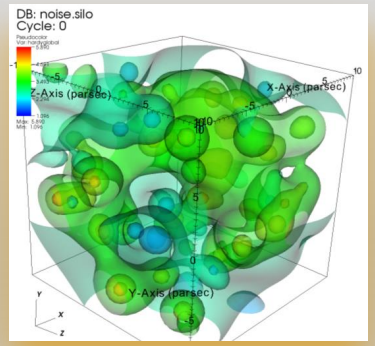
Slide: Courtesy of Sean Ahern, NICS

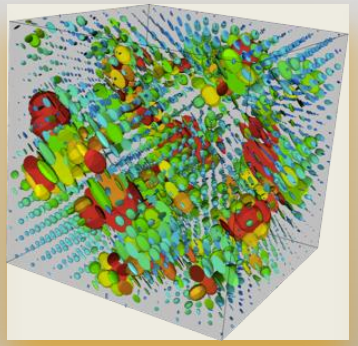
VARIABLES

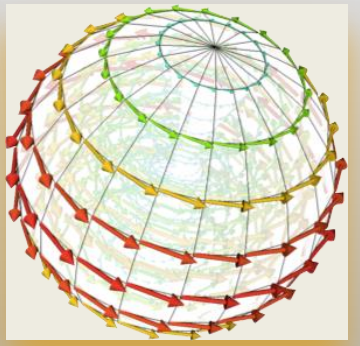
- Scalars
- Vectors
- Tensors
- Multi-dimensional











Slide: Courtesy of Sean Ahern, NICS

MOTIVATION FOR VISUALIZATION

Create visual representations based on underlying data that are

- Concise (Yes)
- Unambiguous (Preferably)
- Intuitive (Trainable)
- Interactive (Desirable)
- Scalable (We wish)

VISUALIZATION BUILDING BLOCKS

Viz Elements

- Glyphs (symbols: e.g. Alphabets, Arrows, Points)
- Lines
- Triangles
- Voxels* (volume element)

*Cannot be directly represented on displays

Viz Attributes

- Transforms (Position, Rotation, Scale)
- Color
- Opacity

View Attributes

- Viewpoint
- Projection (Orthographic, Perspective)
- Canvas

Viz Reinforcement

- Texture
- Light
- Distortion (e.g. displacement)
- Motion (e.g. Camera, time steps)
- Filter (e.g. threshold, resample, subset, slice, clip)
- Add Context (e.g. Connectivity, Map Overlay)

VISUALIZATION TECHNIQUES

Scientific Viz

- Color Map
- Contours, Isosurface And Explicit Geometry
- Volumetric
- Streamlines
- Line Integral Convolution
- Topological
- Glyphs

Information Viz

- Plots (scatter, bar, pie …)
- Heatmaps
- Parallel Coordinates
- Treemaps
- Partition Maps
- Flow Maps
- Networks

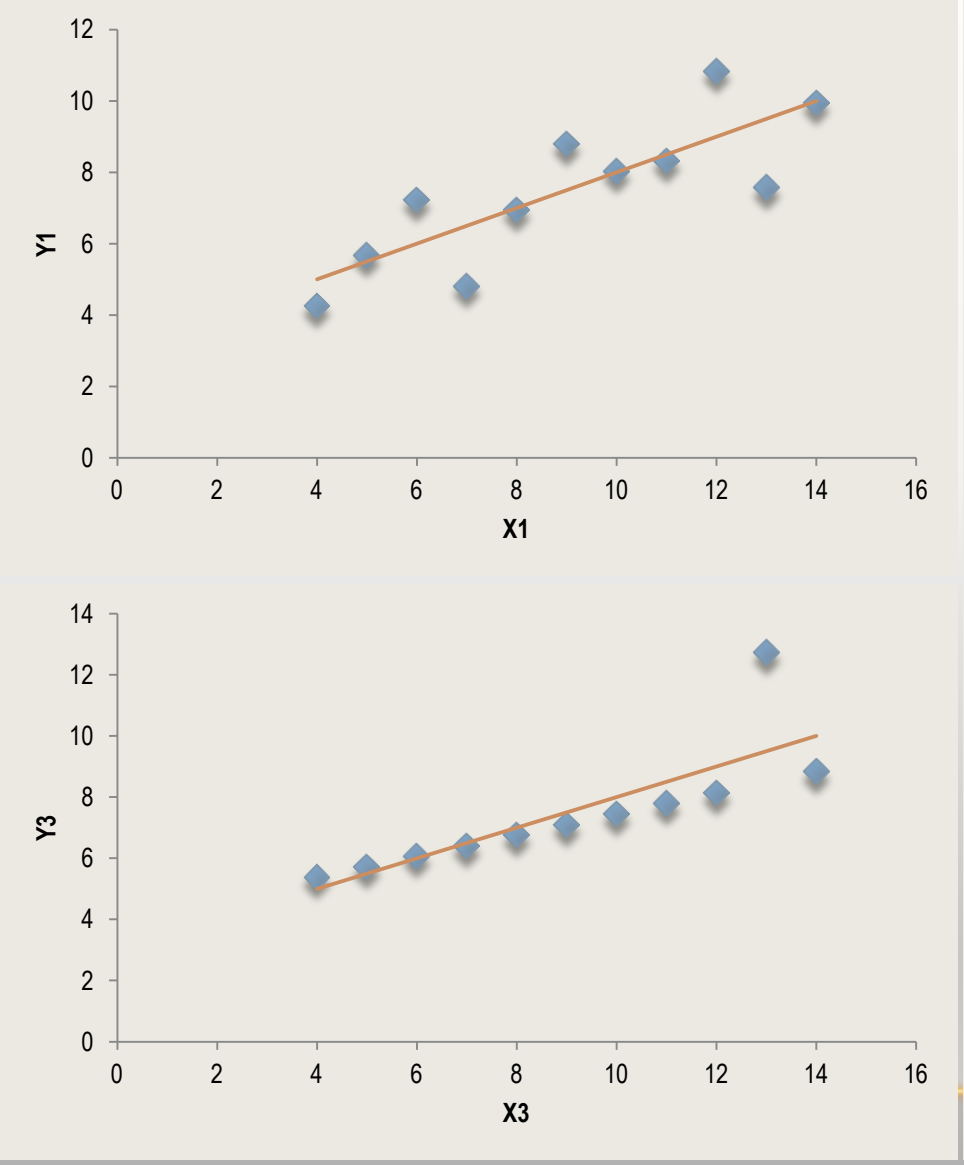
PLOTS AND CHARTS

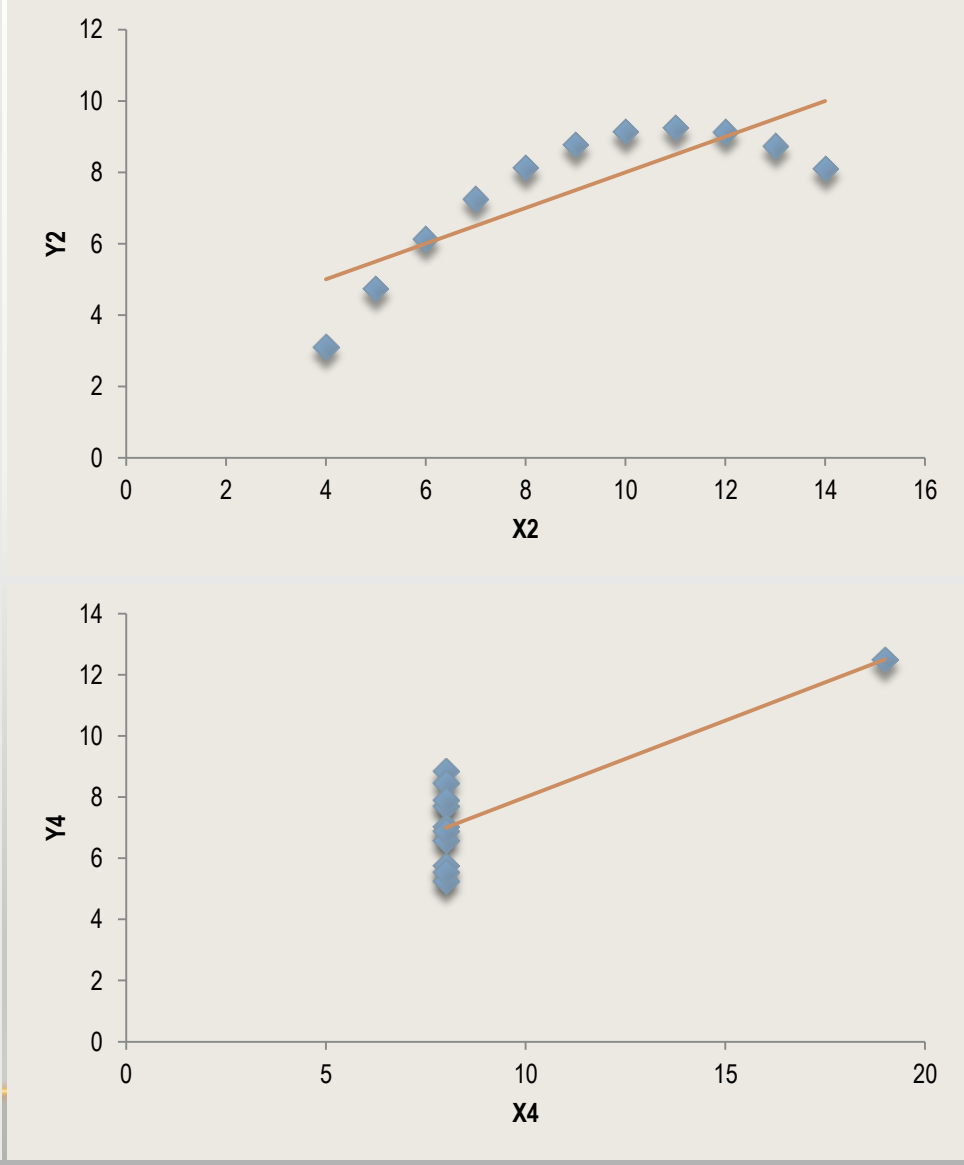
Image: d3js gallery by Michael Bostock

I		II		III		IV	
x1	y1	x2	y2	x3	y3	x4	y4
10	8.04	10	9.14	10	7.46	8	6.58
8	6.95	8	8.14	8	6.77	8	5.76
13	7.58	13	8.74	13	12.74	8	7.71
9	8.81	9	8.77	9	7.11	8	8.84
11	8.33	11	9.26	11	7.81	8	8.47
14	9.96	14	8.1	14	8.84	8	7.04
6	7.24	6	6.13	6	6.08	8	5.25
4	4.26	4	3.1	4	5.39	19	12.5
12	10.84	12	9.13	12	8.15	8	5.56
7	4.82	7	7.26	7	6.42	8	7.91
5	5.68	5	4.74	5	5.73	8	6.89

mean(X) = 9, **variance**(X) = 11
mean(Y) = 7.5, **variance**(Y) = 4.12
linear regression lineY = 3 + 0.5*X
correlation(X,Y) = 0.816

Anscombe's Quartet





Anscombe 1973,TheAmerican Statistician

HORIZON CHARTS

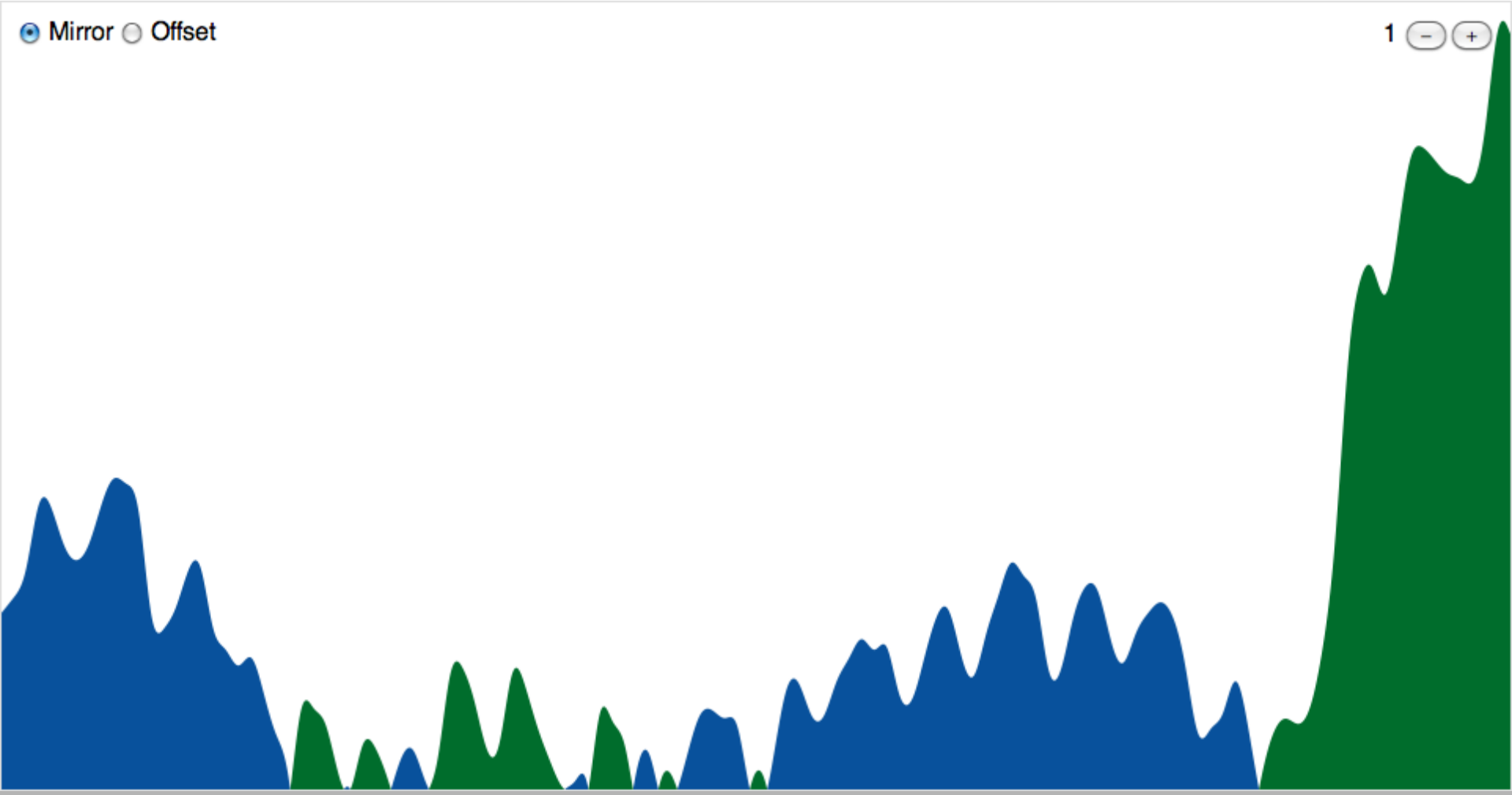
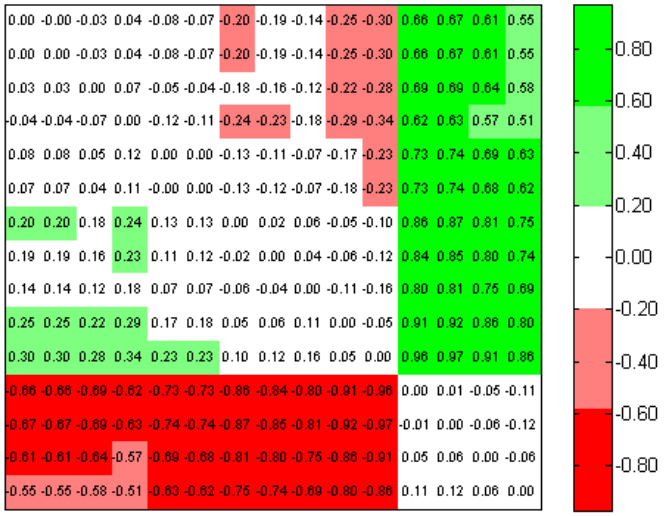


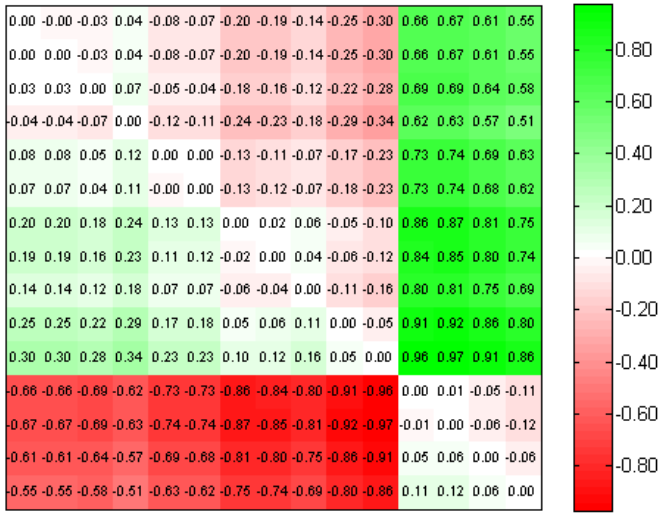
Image: horizon charts by Michael Bostock

HEATMAPS

Process: Map scalar data to a color table

Visual Validation

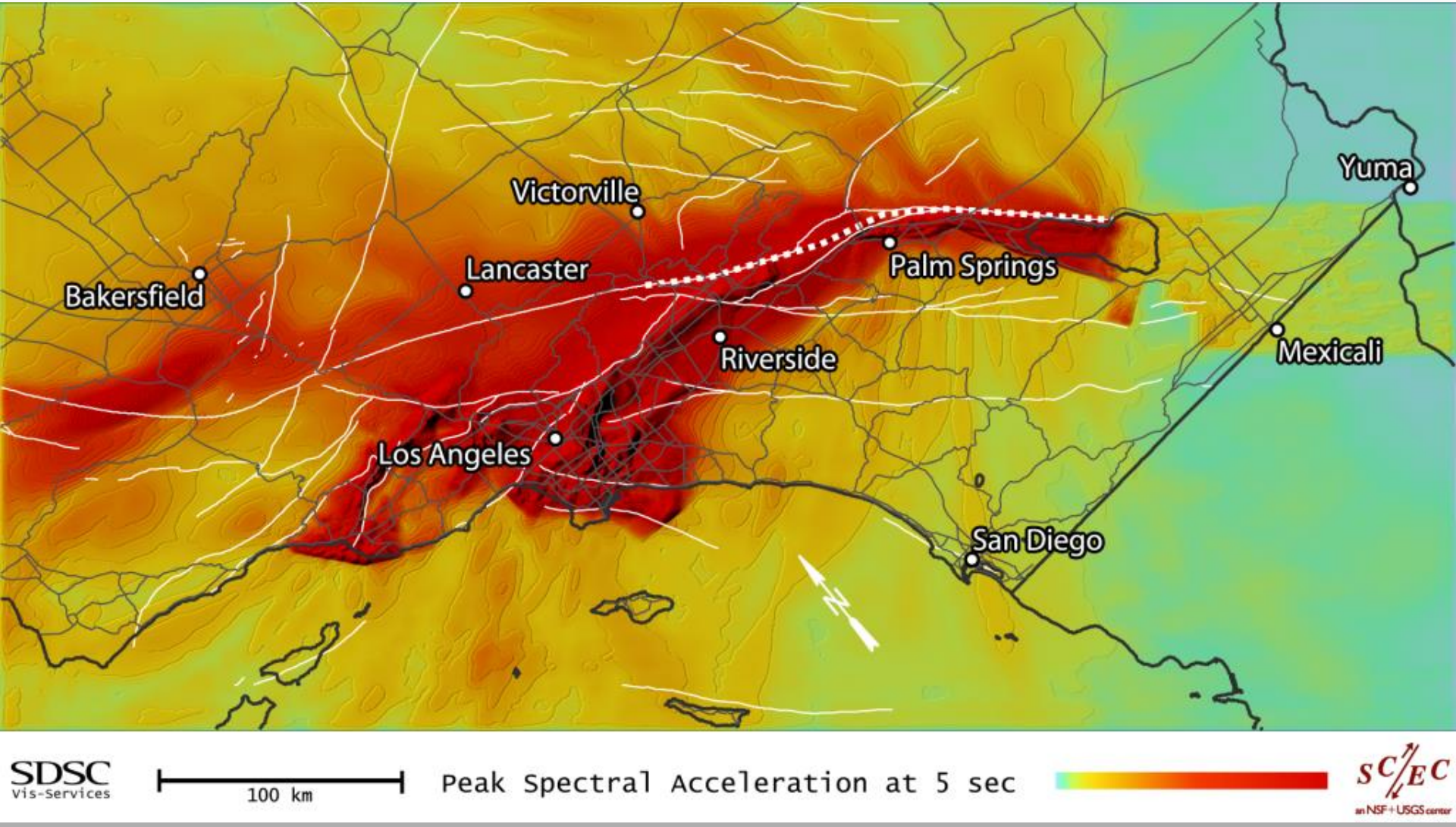




Utility: To investigate range of data
Swift error diagnostic and visual validation

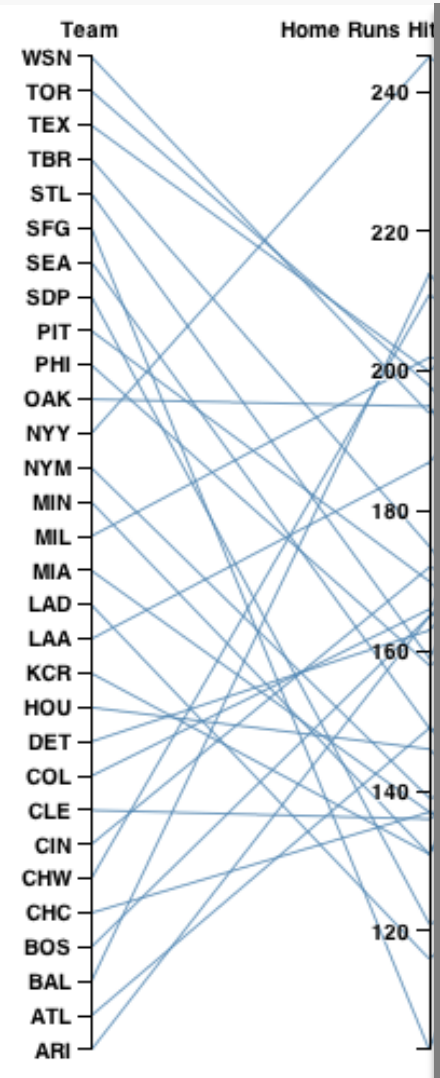
Images: Mathworks.com (Heatmap example)

HEATMAPS = COLORMAPS = PSUEDOCOLOR PLOTS



PARALLEL COORDINATES

Process: Connect data in a pair wise manner on Y-Y axes



PARALLEL COORDINATE - INTERACTIVITY

- Filter example
- Hover example
- All hit stats example
- Sophisticated example

Utility: Summarize high dimensional data
Find trends and relationships

PARALLEL SETS

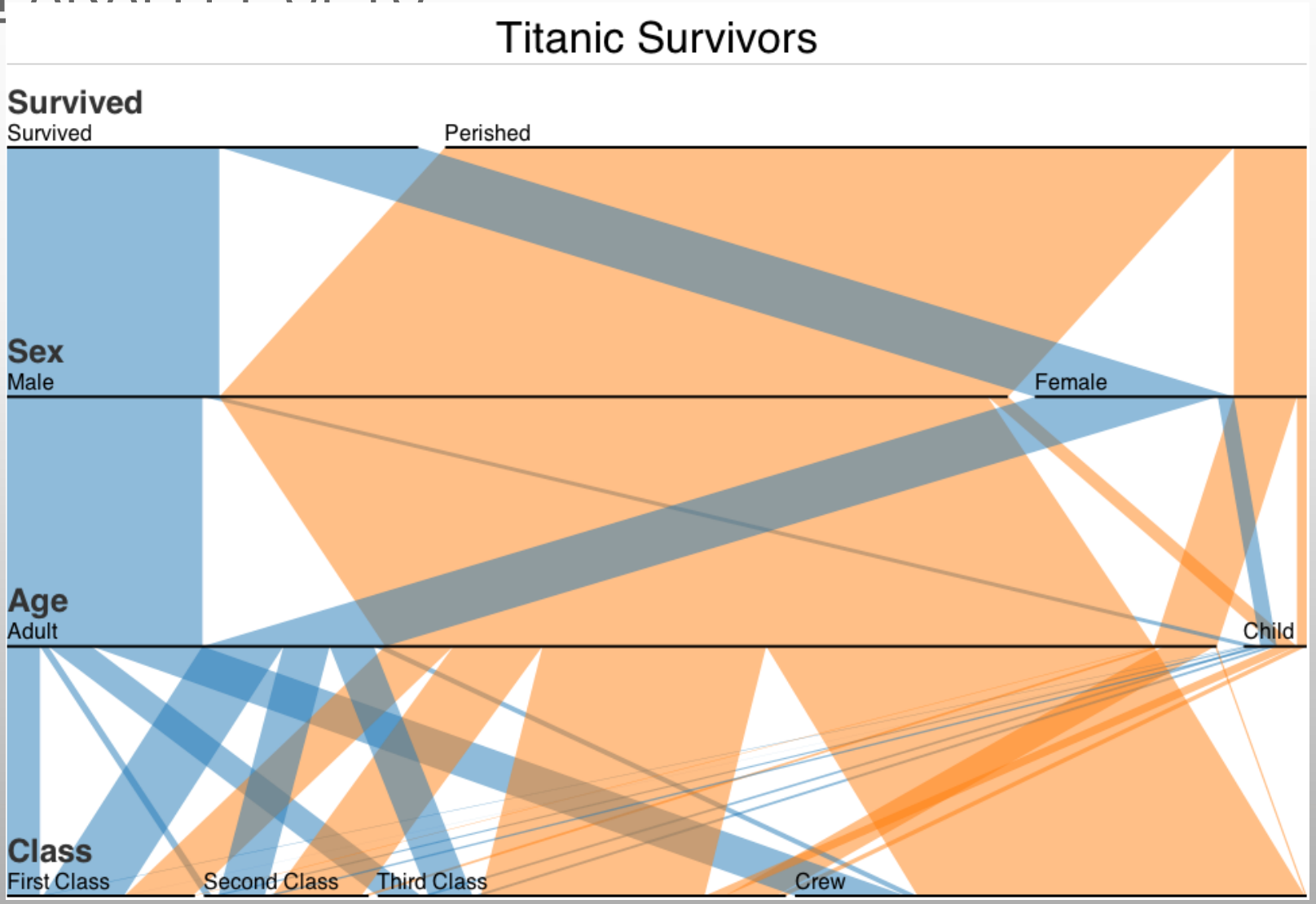


Image: Titanic Survivors by Michael Bostock

TREEMAP

Process: Recursive mapping of hierarchical data into rectangles

Treemap designed by Ben Shneiderman, UMD (1990)
History and examples

Utility:
Compare tree structures and attributes of varying depth

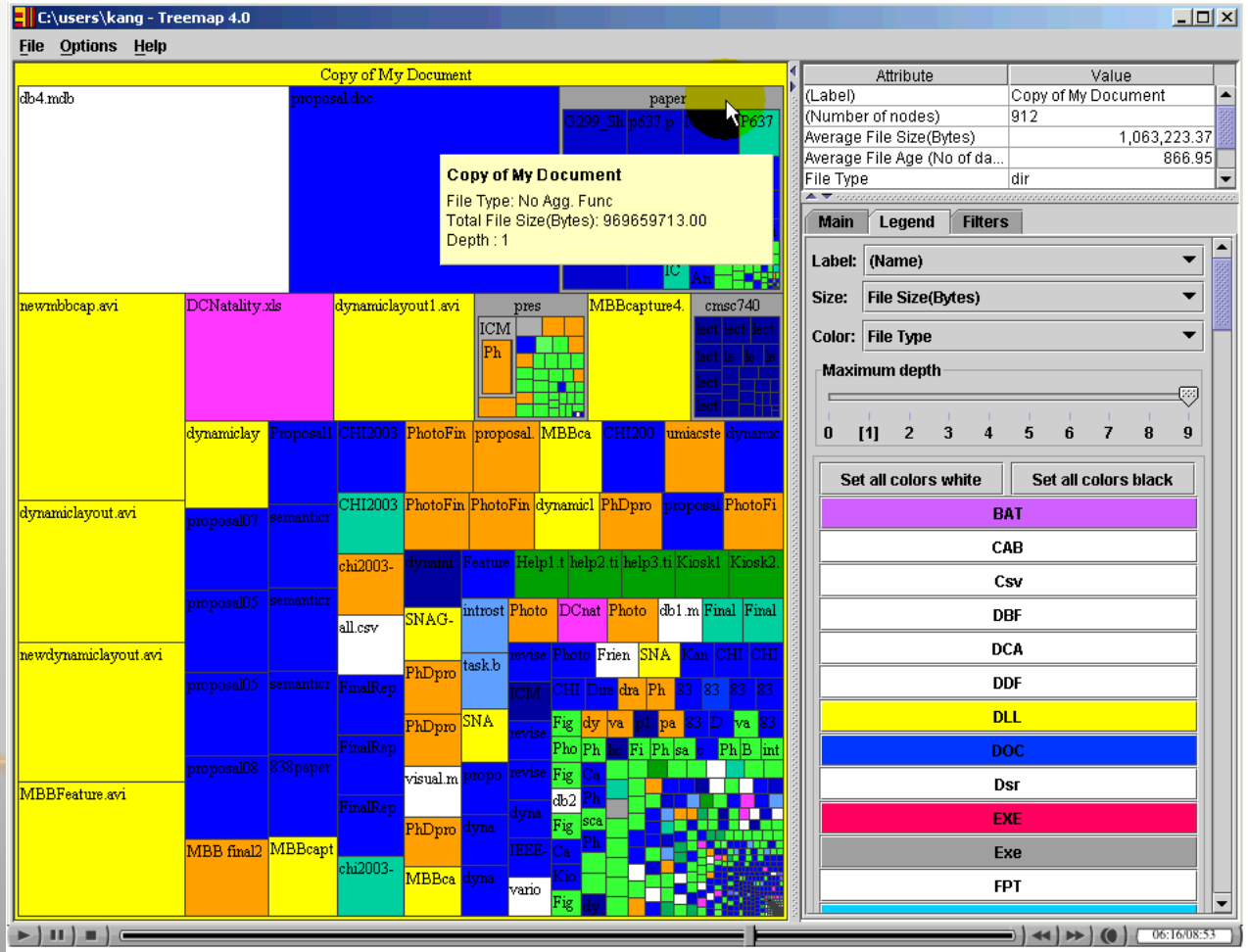


Image: Treemap Demo, UMD

TREEMAP VARIATIONS

Circular Treemap

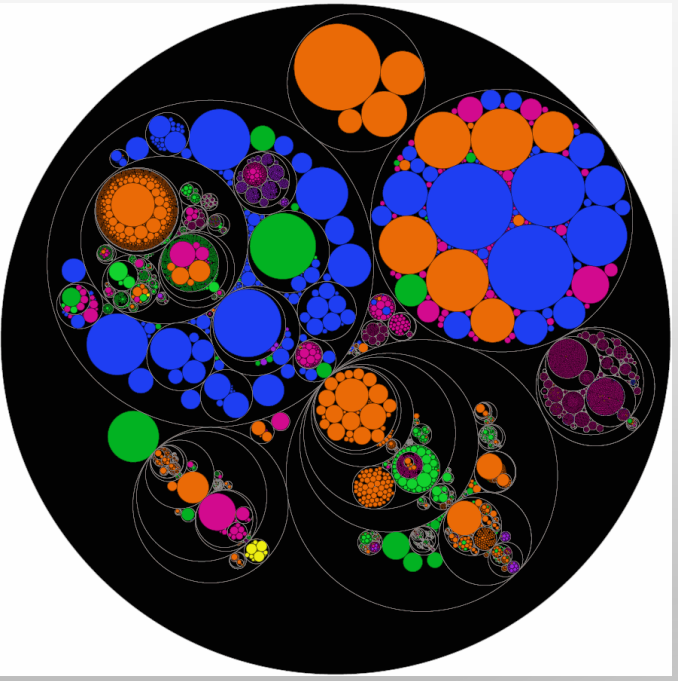
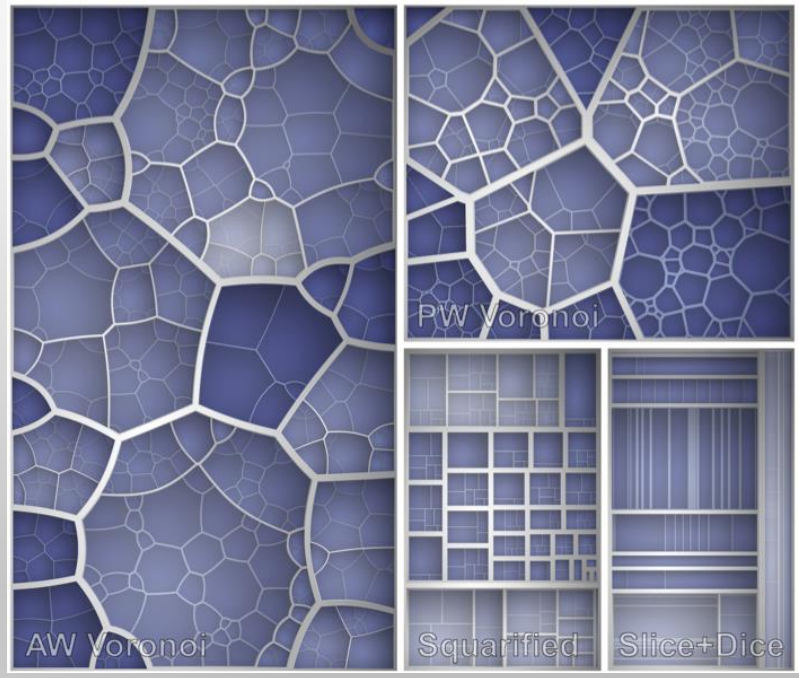


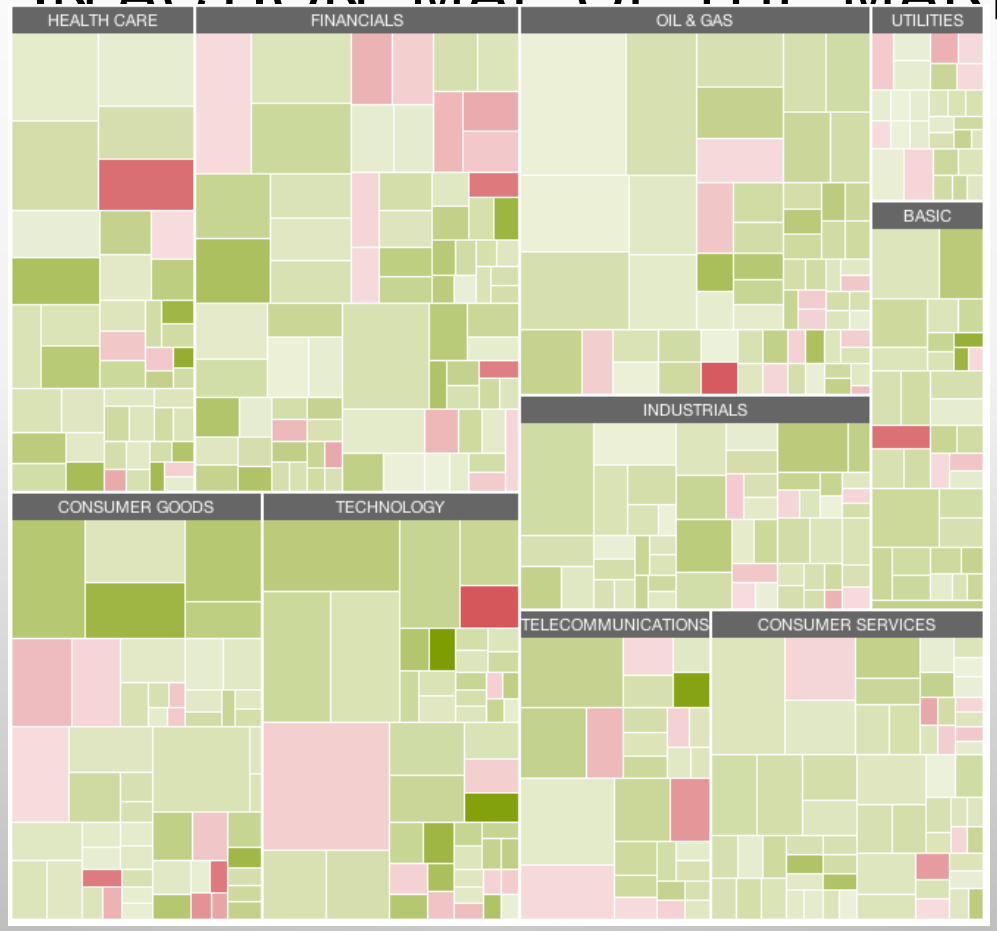
Image: Kai Wetzel

Voronoi Treemap



Circa (2005): Michael Blazer and Deussen

TREEMAP IN ACTION: MAP OF THE MARKET



WSJ's SmartMoney

TREEMAP -INTERACTION

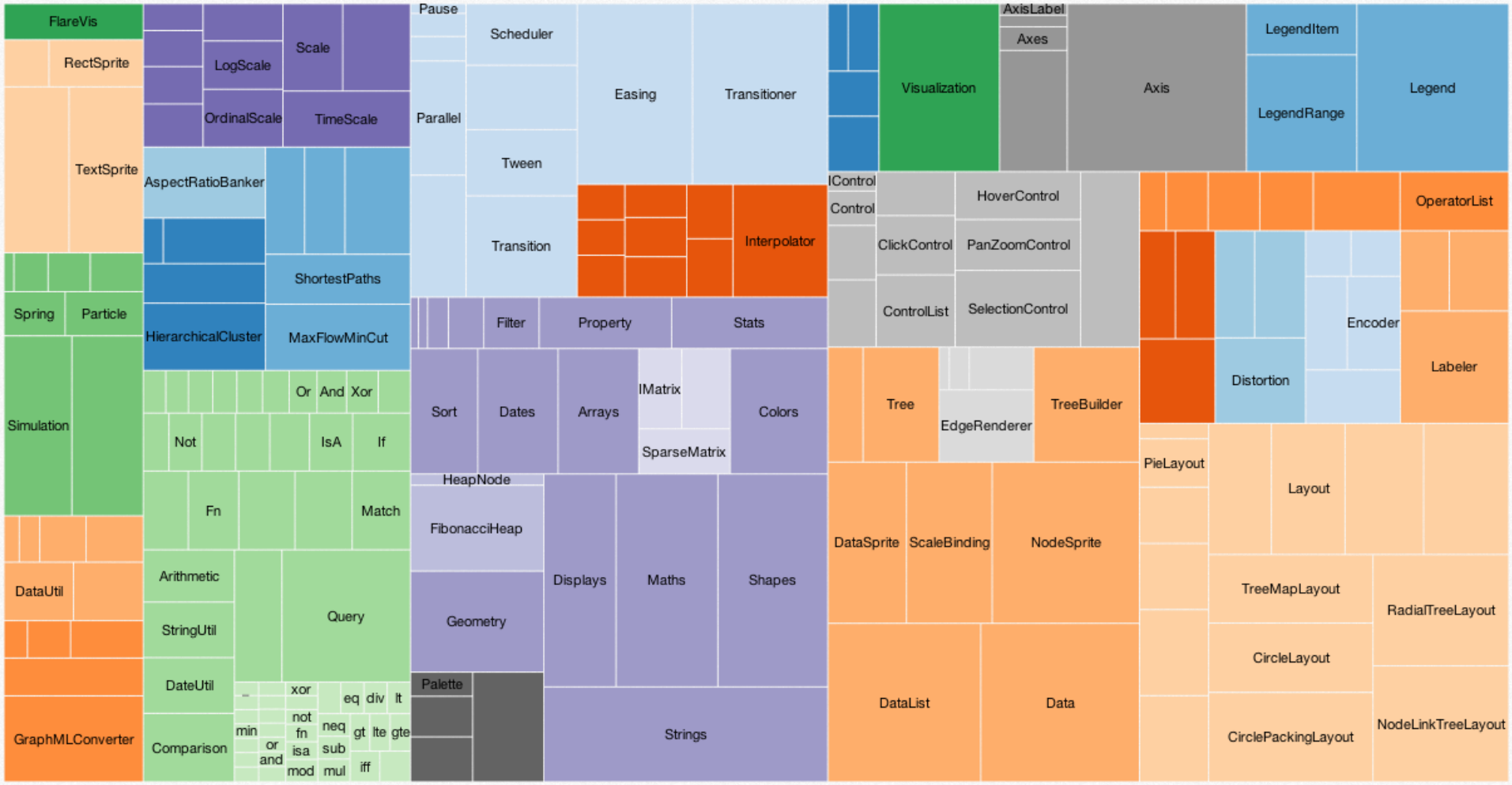
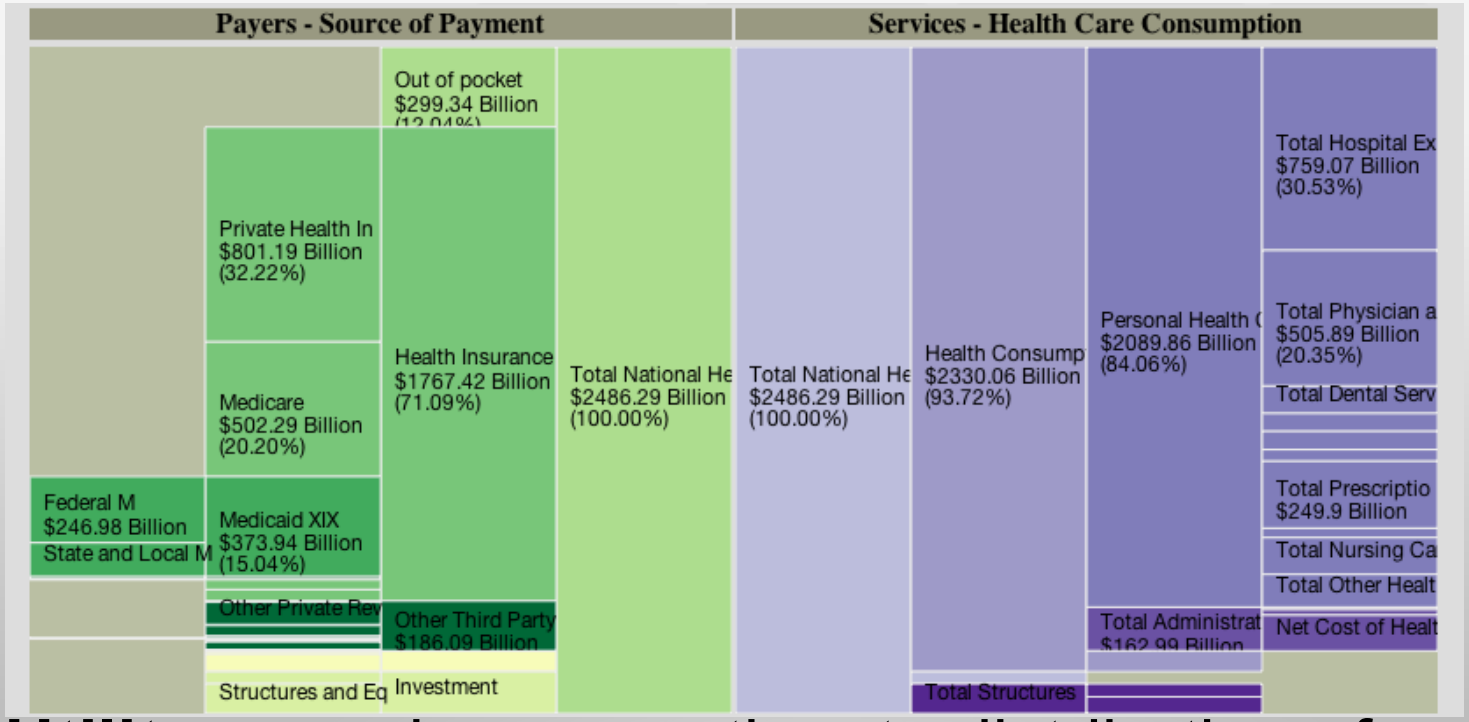


Image: Treemap example by Michael Bostock

PARTITION MAP

Process: transform a hierarchical data into a linearly proportionate rectangles

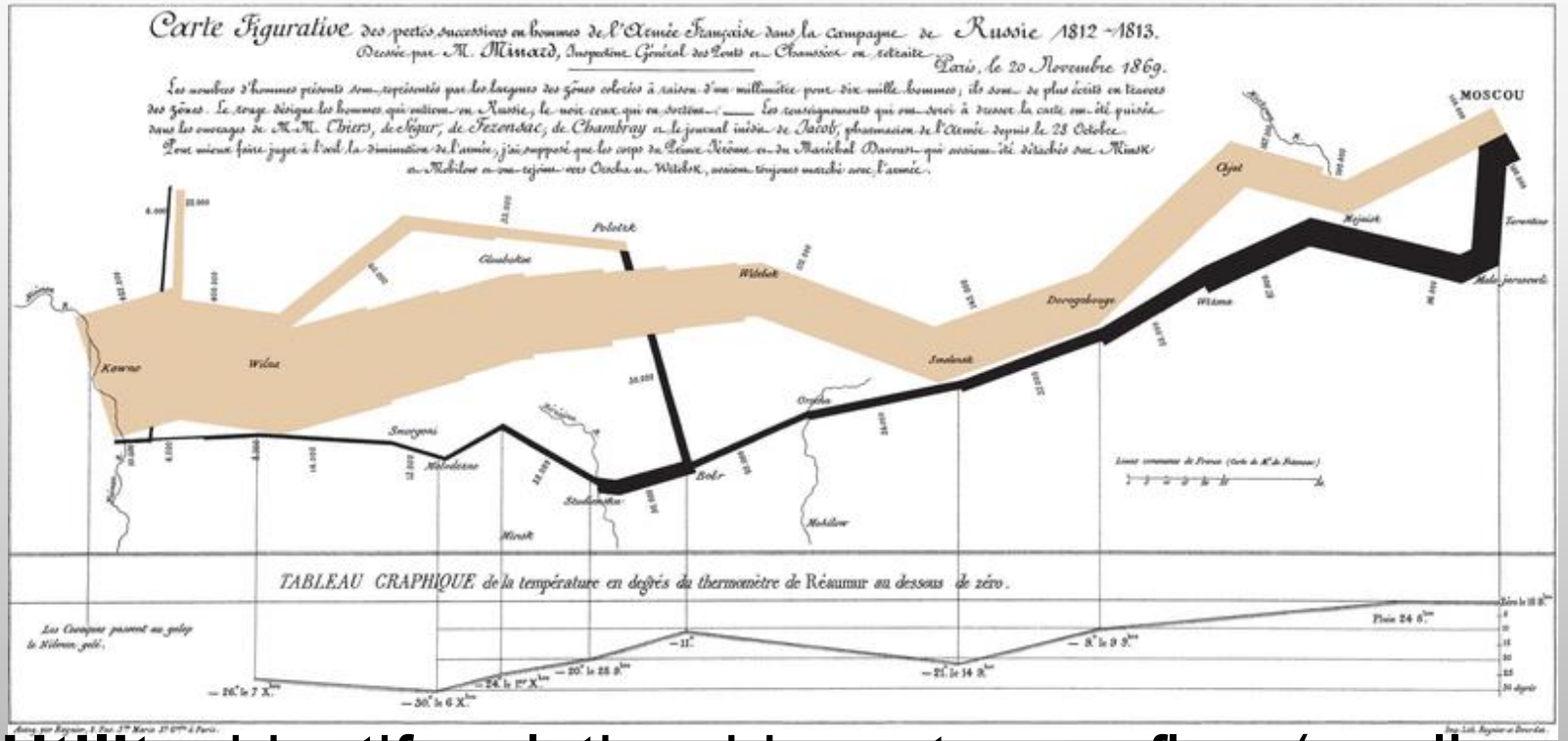


Interactive Link

Utility: examine proportionate distribution of hierarchical data

FLOW MAP

Process: connect items depicting flow in proportionate manner



Utility: identify relationship, nature or flow (swell and attrition) and corresponding events

Image: Charles Joseph Minard (1869)

FLOW DIAGRAMS

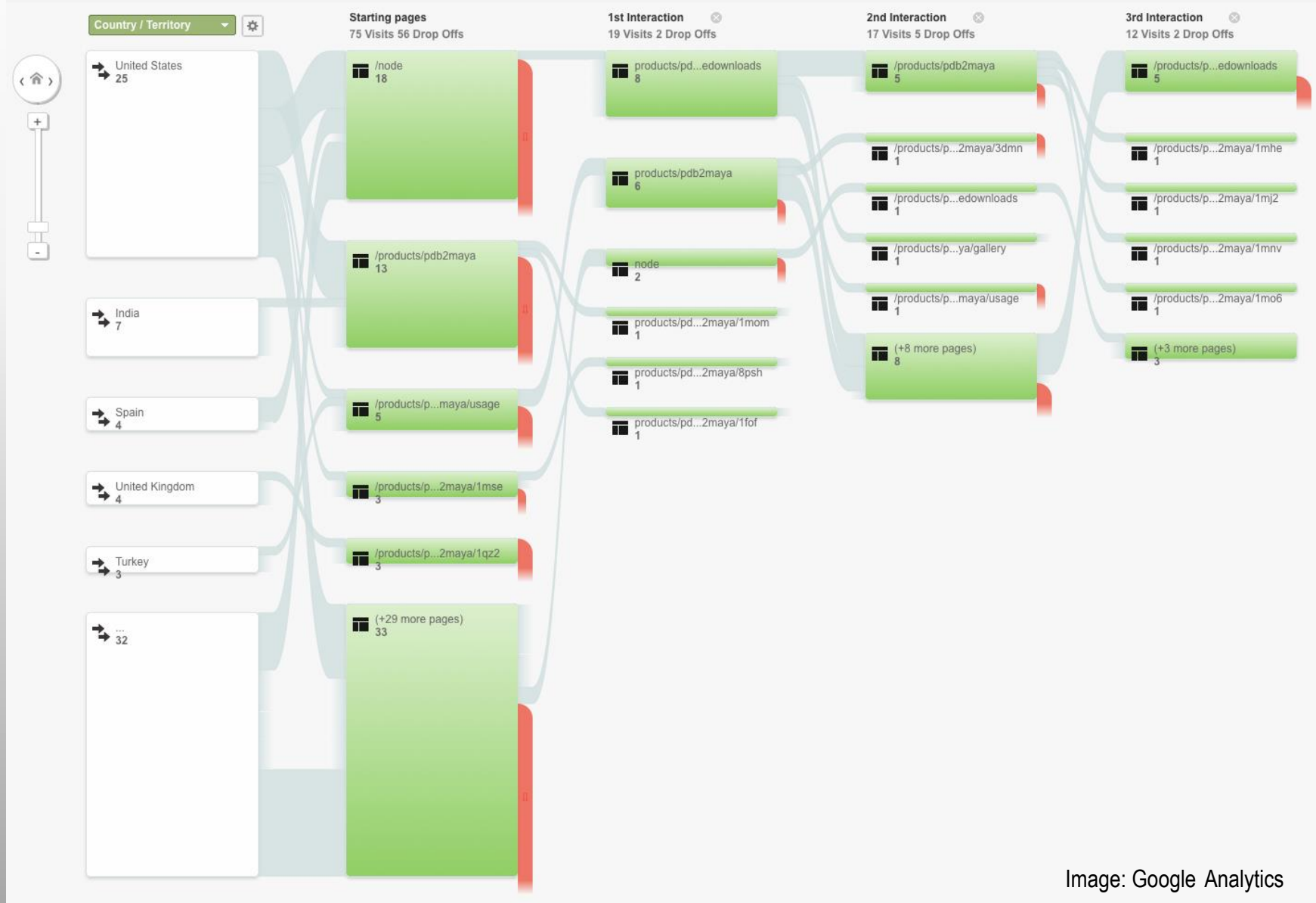


Image: Google Analytics

SANKEY DIAGRAMS

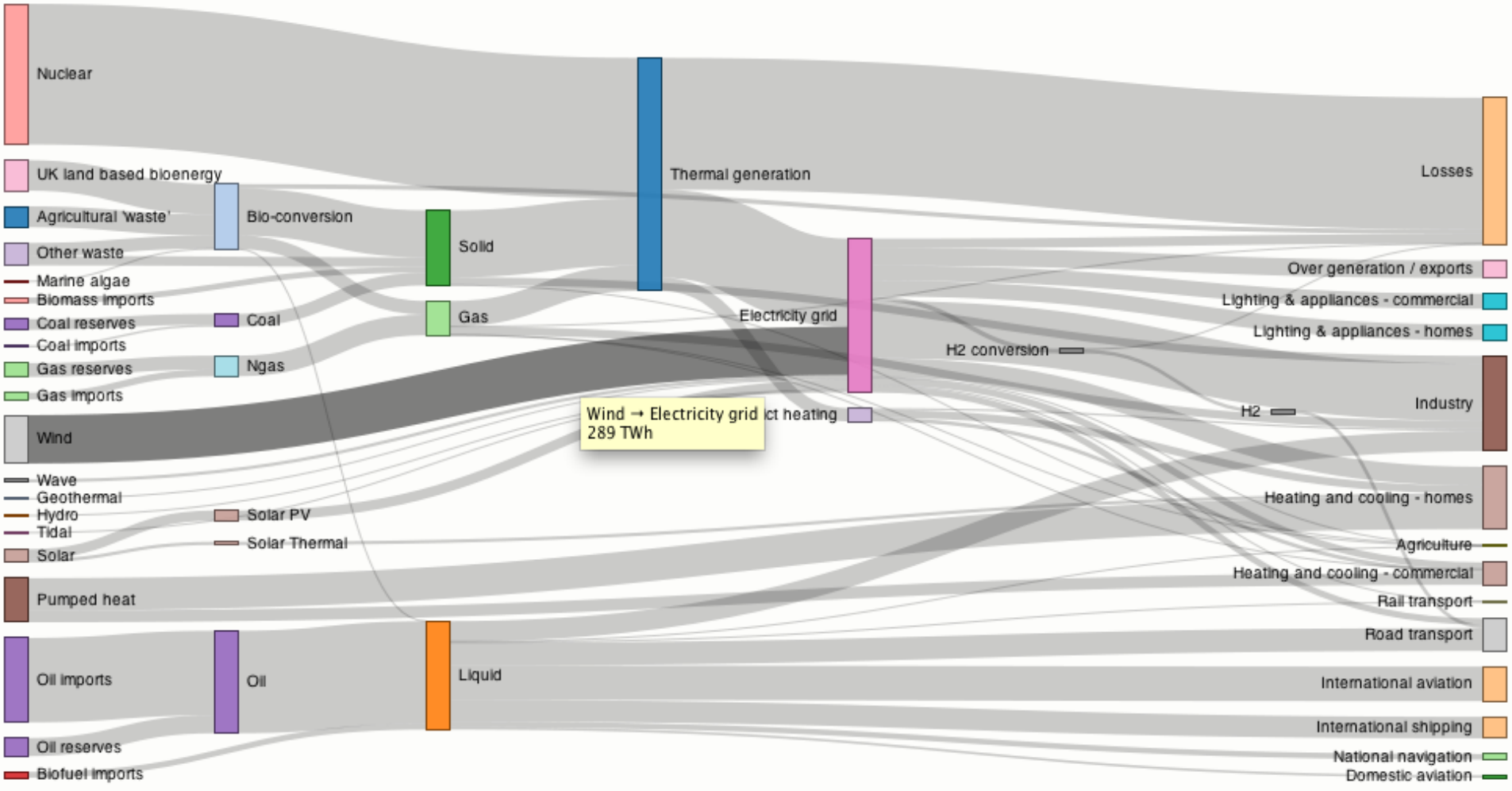
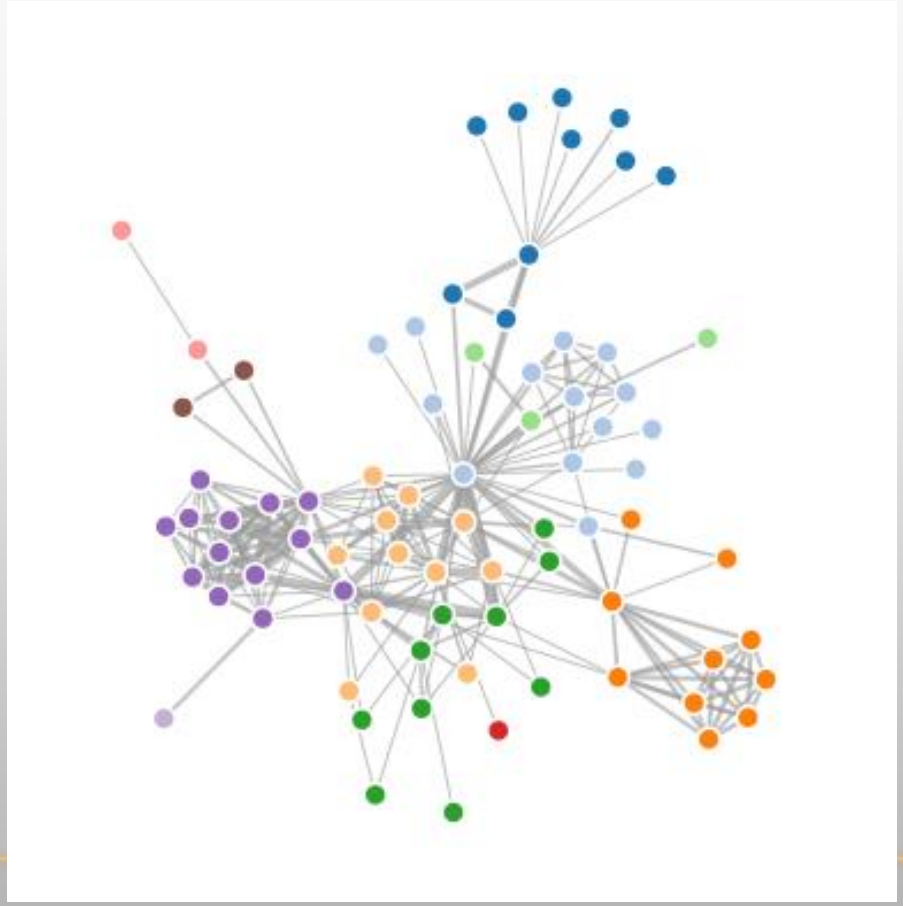


Image: Sankey Diagram by Michael Bostock

NETWORKS

Process: topologically represent hierarchical data



Utility: Show and investigate relationships

Image: Force Directed Layout by Michael Bostock

LONDON UNDERGROUND MAP 1932

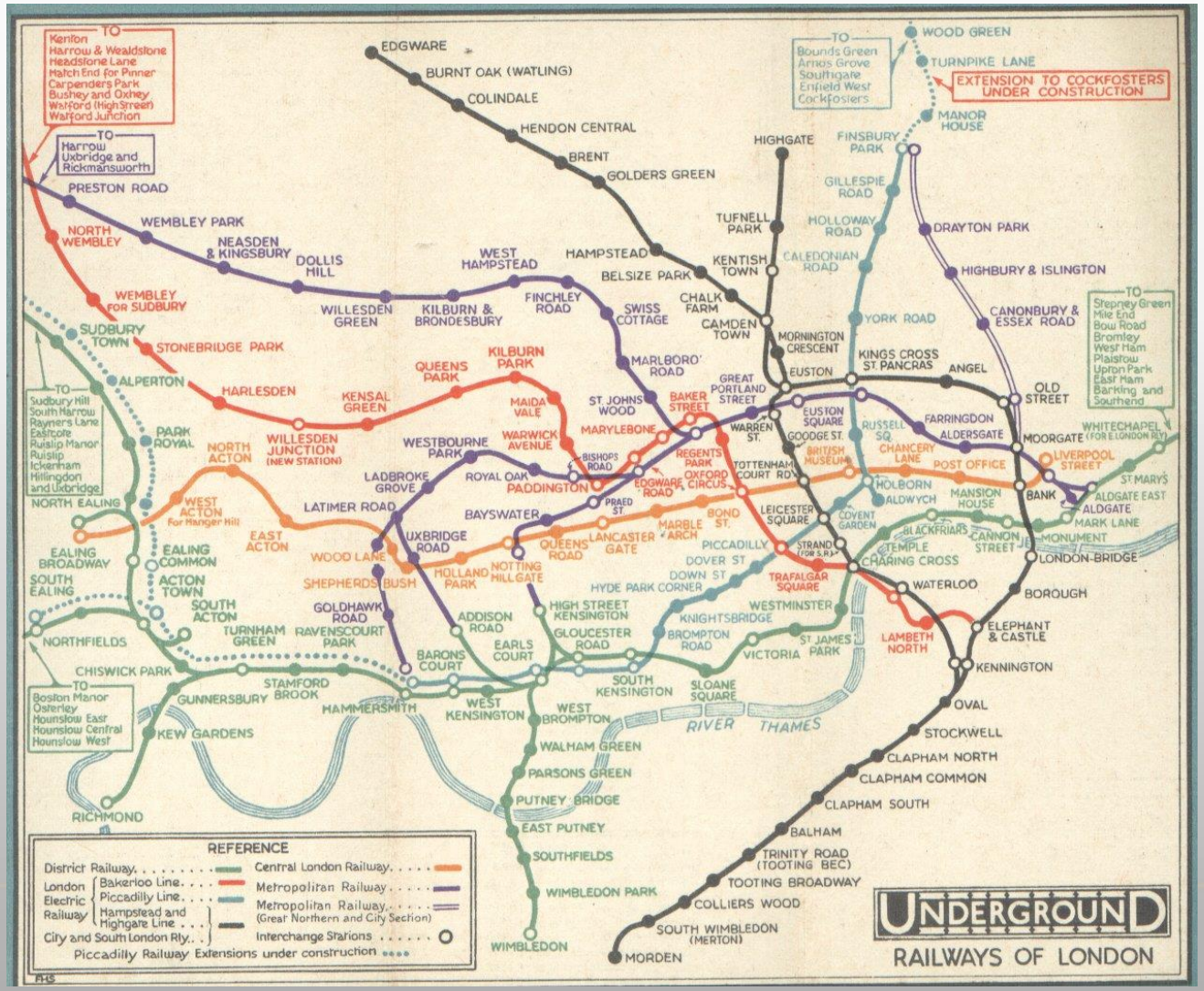


Image: A History of the London Tube Maps

LONDON UNDERGROUND MAP 1933

Image: London Transport website

DECISION TREE

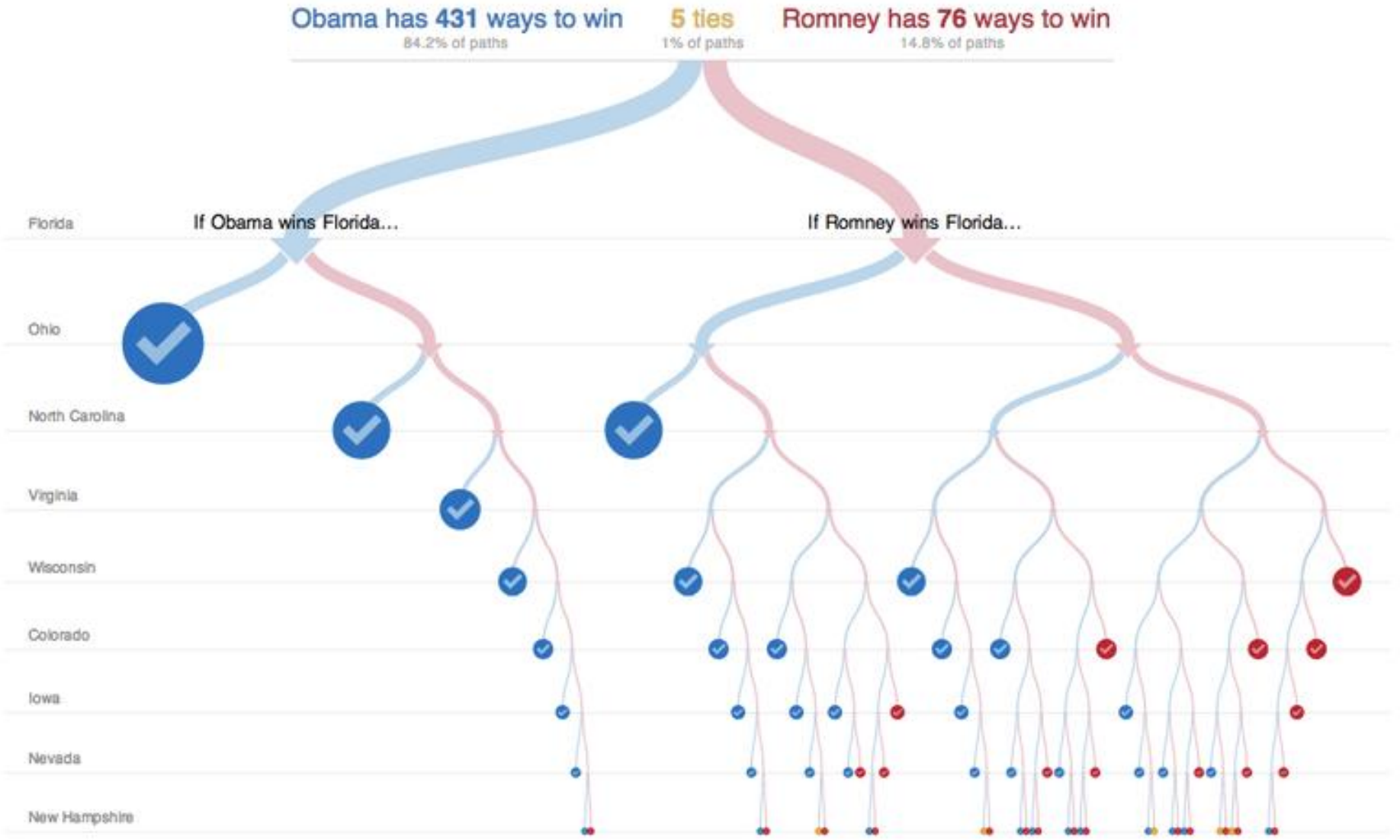
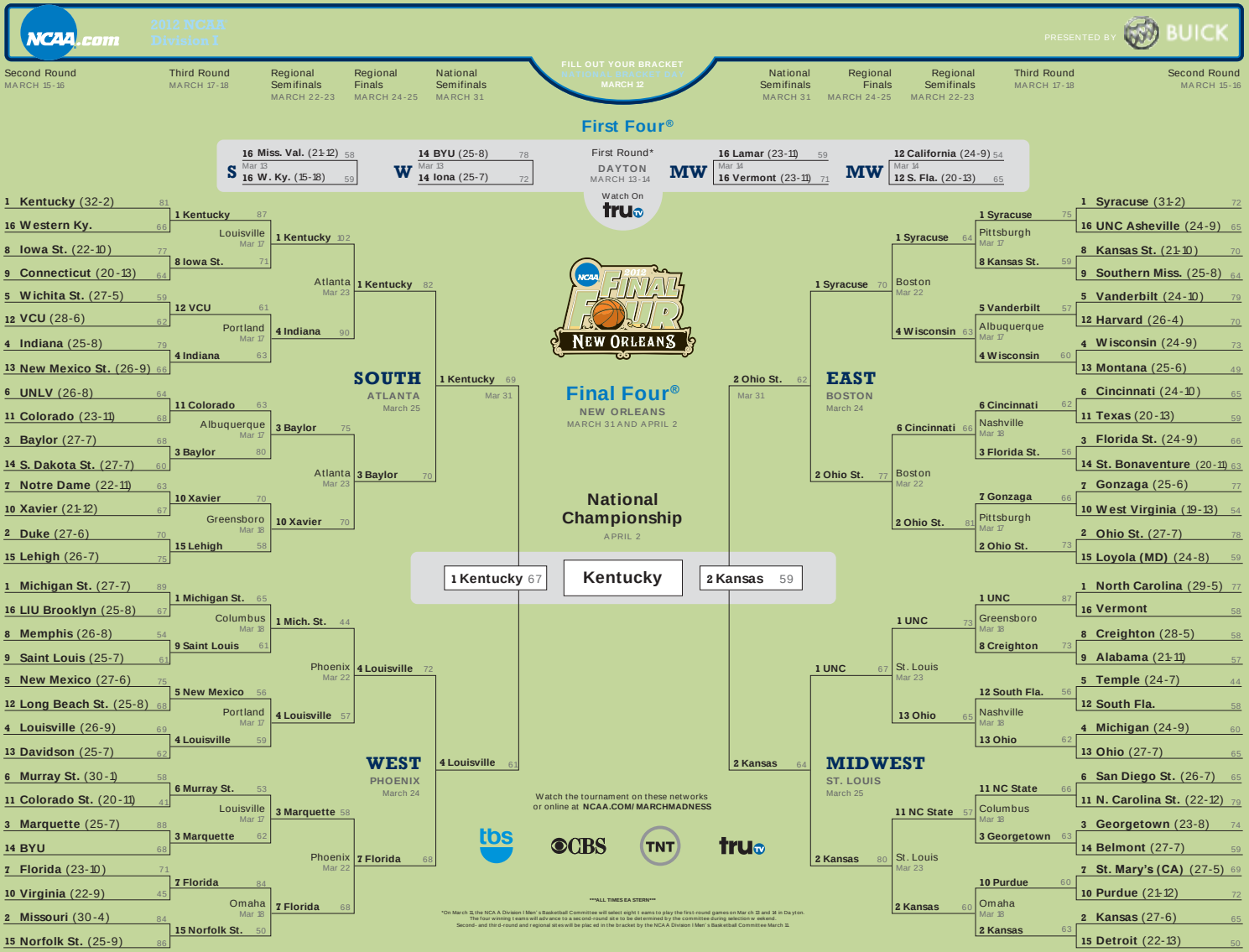


Image: “512 Paths to the White House” by Mike Bostock and Shan Carter, New York Times

HIERARCHICAL NETWORK



CIRCULAR NETWORK

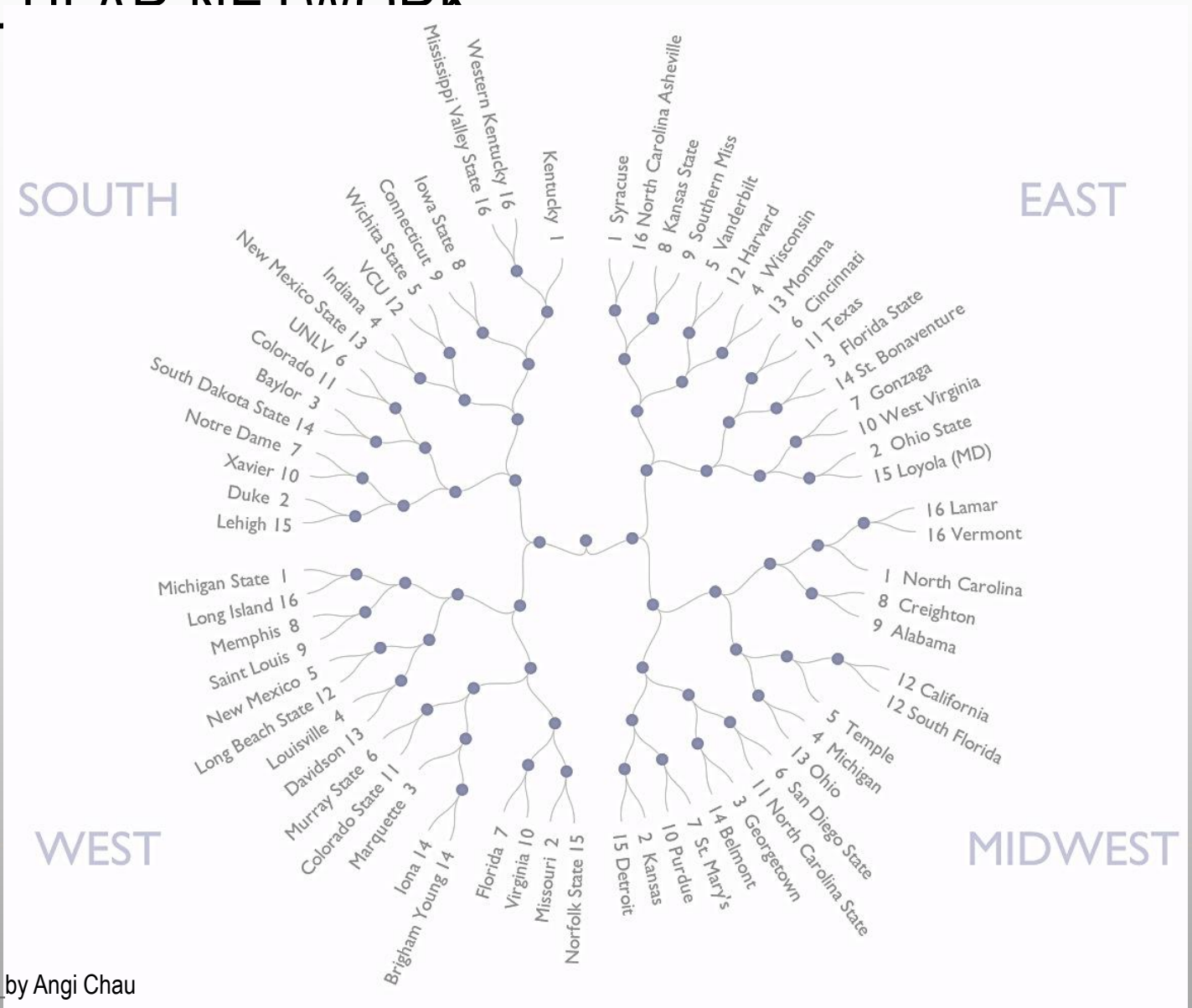


Image: Visualization by Angi Chau

CHORD DIAGRAMS

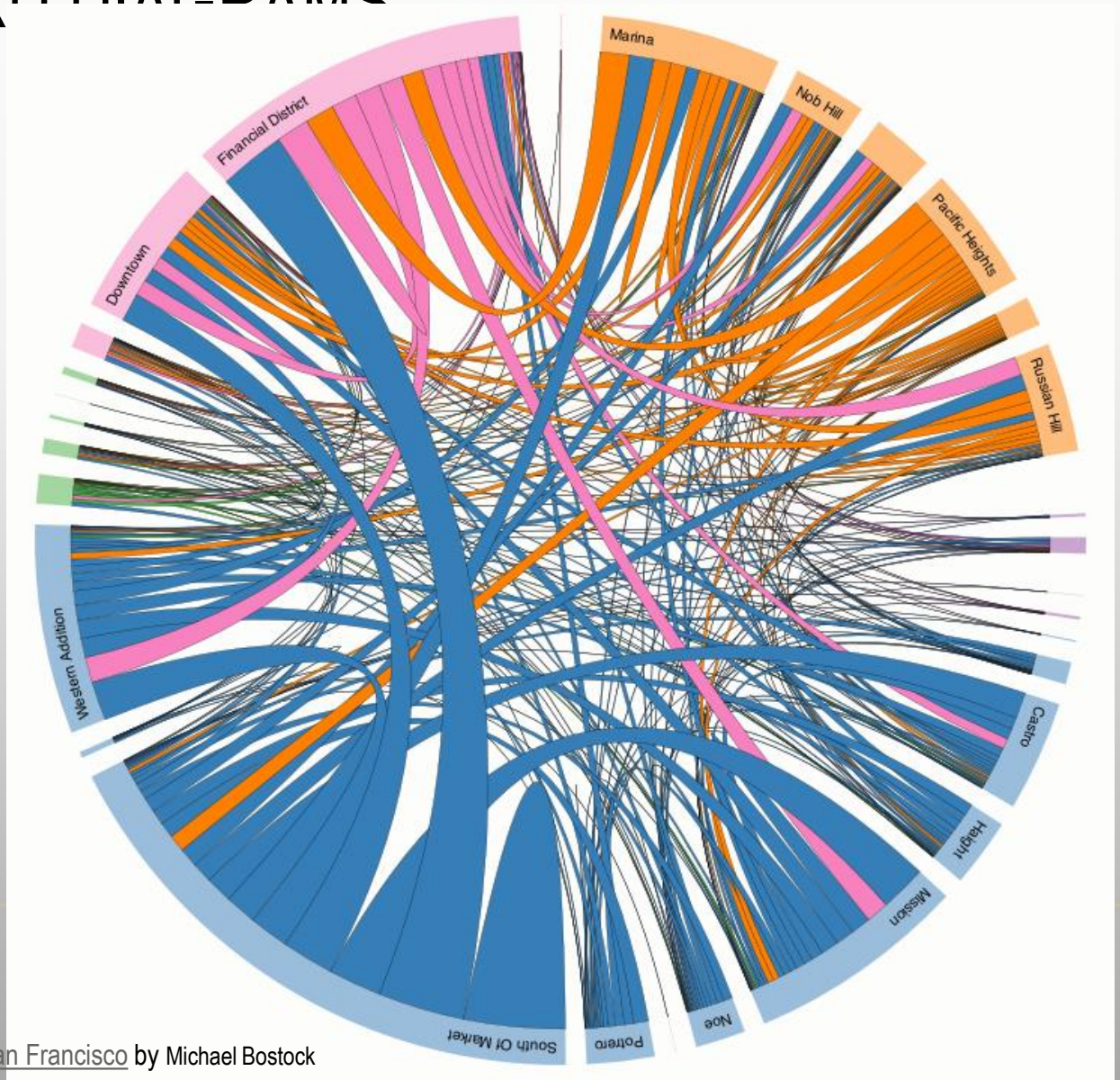
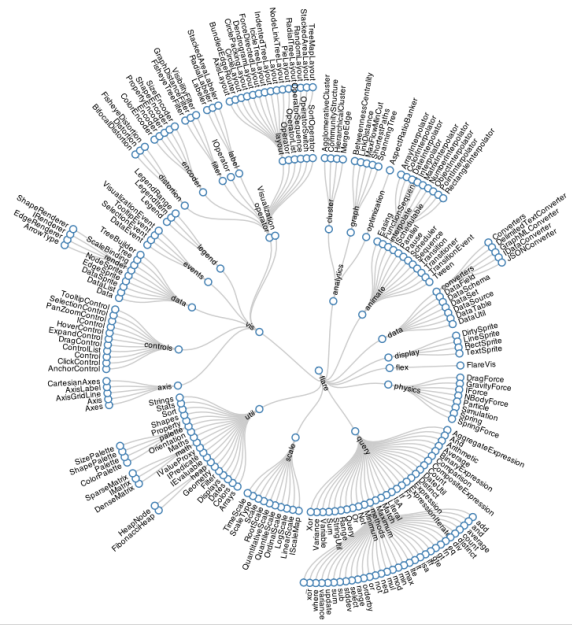


Image: Uber taxi rides in San Francisco by Michael Bostock

HYPERBOLIC MAP AND MAY OTHERS



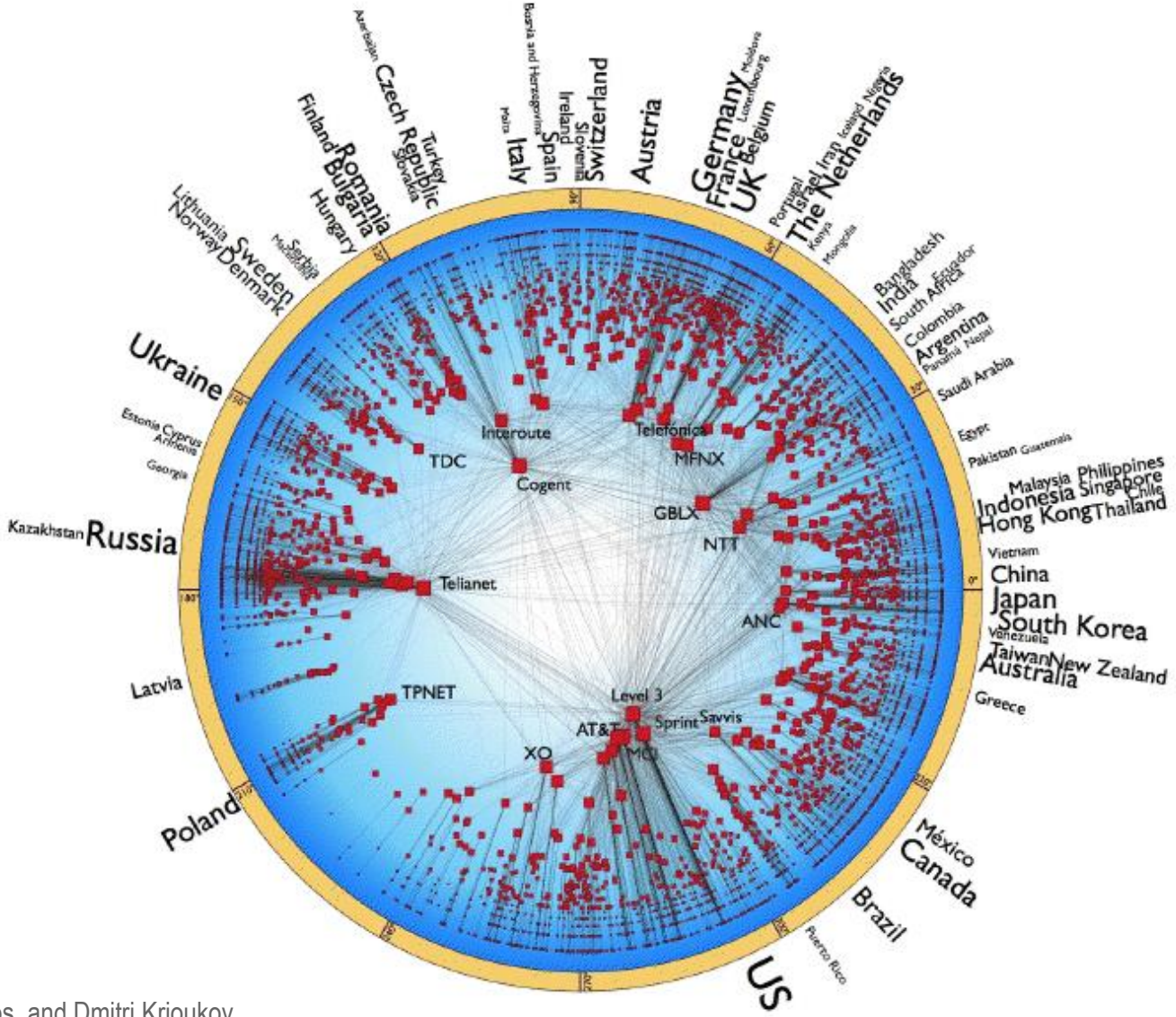


Image: Reingold-Tilford Tree by Michael Bostock

Marian Boguna, Fragkiskos Papadopoulos, and Dmitri Krioukov

TOOLS

(ALPHABETIC LISTING)

Open	Proprietary
Cytoscape	Cognos
Circos	Matlab
Data-Driven Documents(D3.JS)	Tableau
Gephi	
ggobi	
Leaflet	
R	
Processing	

Many More …

Figure 3 Forrester Wave™: Advanced Data Visualization (ADV) Platforms, Q3 '12

Source: Forrester Research, Inc.

REFERENCES

- Readings in Information Visualization: Using Vision to Think

  Stuart K. Card, Jock Mackinlay, Ben Shneiderman

- Interactive Data Visualization: Foundations, Techniques, and Applications

  Matthew O. Ward; Georges Grinstein; Daniel Keim

Continue to learn and apply viz ...

Collaborate and **consult** with us at SDSC

amit [@] sdsc.edu

Acknowledgements

PACE Boot Camp organization team

Q & A

SESSION 1B: SCIENTIFIC VISUALIZATION

WHAT IS SCIENTIFIC VISUALIZATION?

Working Definition

Visually gaining/extracting insight from a scientific data

or

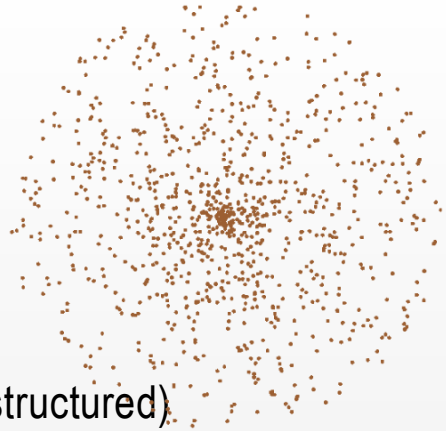
Creating a visual representation of data

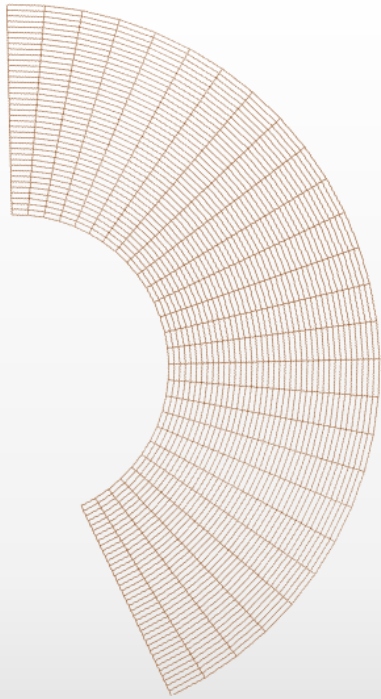
Questions

Are charts visualizations?

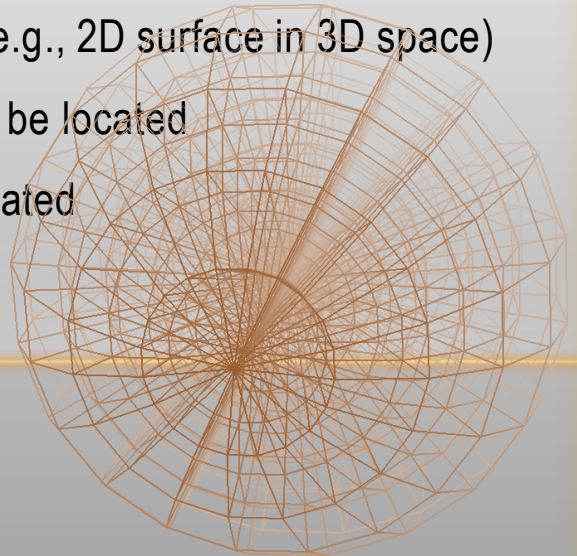
Are illustrations visualizations?

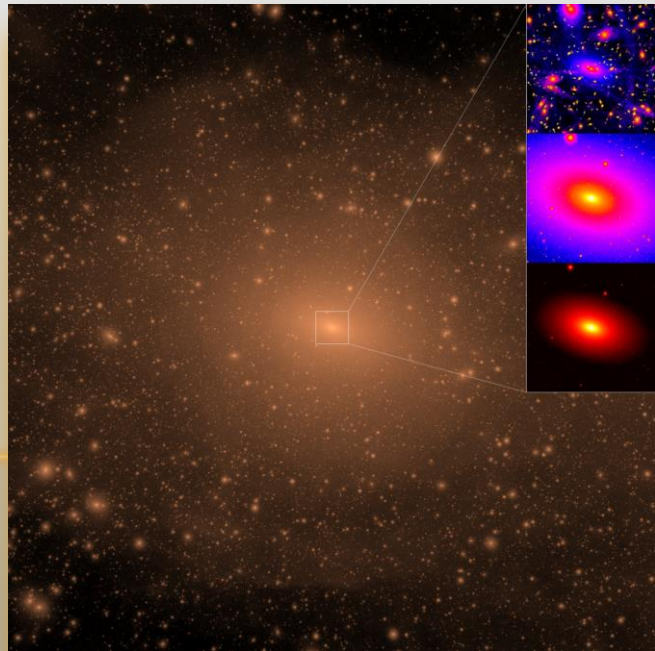
DATA





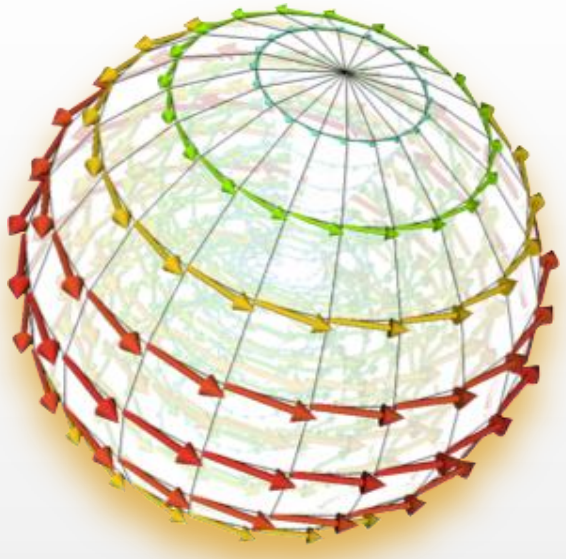
- Data
  - High Dimensional (structured and unstructured)
  - Mesh
- Meshes discretize space into points and cells
  - 1D, 2D, 3D
  - All of these over time (up to 4D)
  - Can have lower-dimensional meshes in a higher-dimensional space (e.g., 2D surface in 3D space)
  - Provides a place for data to be located
  - Defines how data is interpolated



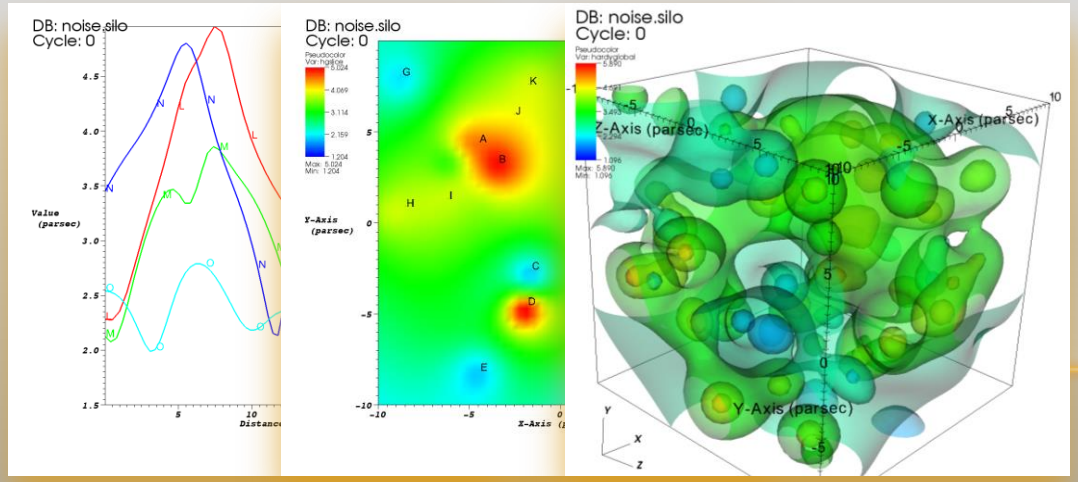


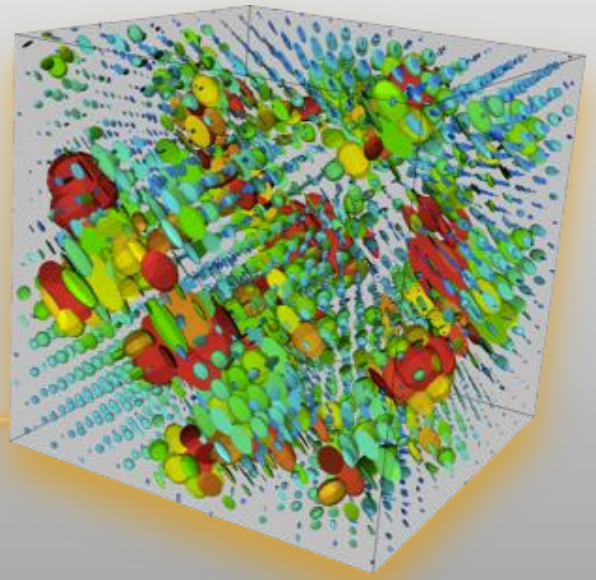
Slide: Courtesy of Sean Ahern, NICS

VARIABLES



- Scalars, Vectors, Tensors
- Sits on points or cells of a mesh
  - Points: linear interpolation
  - Cells: piecewise constant
- Could have different dimensionality than the mesh (e.g., 3D vector data on a 2D mesh)





Slide: Courtesy of Sean Ahern, NICS

MOTIVATION FOR VISUALIZATION

Create visual representations based on underlying data that are

- Concise (Yes)
- Unambiguous (Preferably)
- Intuitive (Trainable)
- Interactive (Desirable)
- Scalable (Often)

VISUALIZATION TECHNIQUES

VISUALIZATION TECHNIQUES

- **COLOR MAP (Pseudocolor)***
- **CONTOURS***, **ISOSURFACE*** AND EXPLICIT GEOMETRY
- **VOLUMETRIC***
- STREAMLINES
- LINE INTEGRAL CONVOLUTION
- GLYPHS
- TOPOLOGICAL (advanced)
- **PARALLEL COORDINATES***, NETWORKS, ETC.

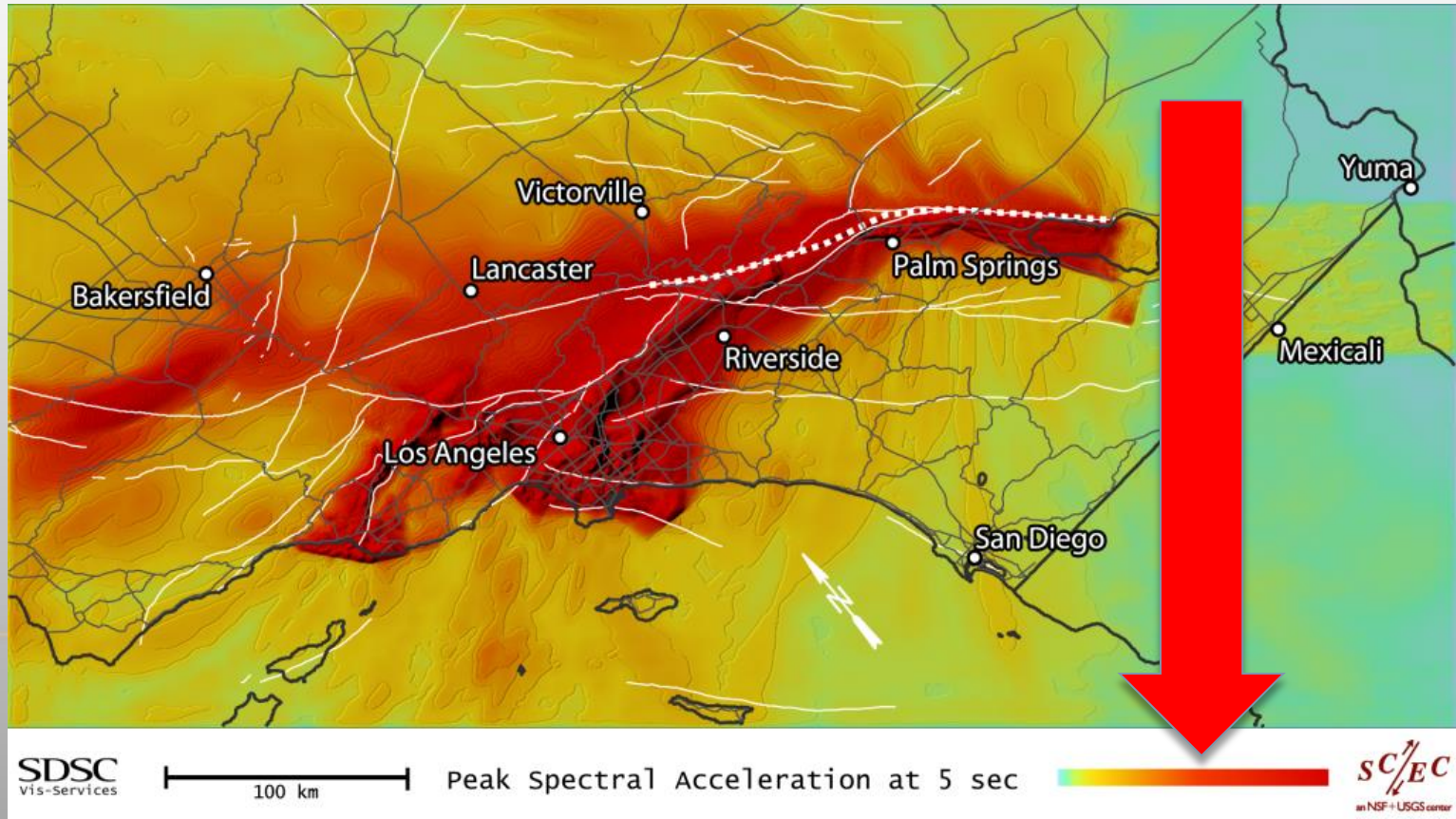
* We will create these plots using VisIt in the hands-on session.

VIZ TECHNIQUES: COLOR MAP (PSUEDOCOLOR PLOT)

Process: Map scalar data to a color table

Utility: To investigate range of data

Fast and great for Error Diagnostics and Visual Validation



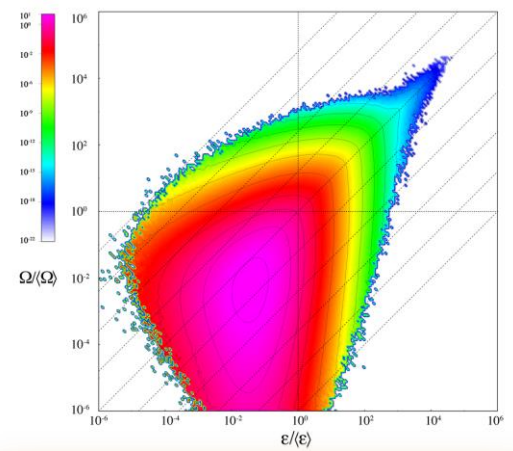
VIZ TECHNIQUES: GEOMETRIC

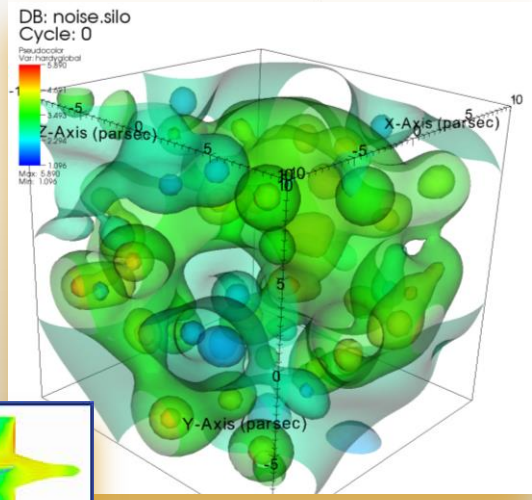
Process & Utility: Identify regions of same scalar value

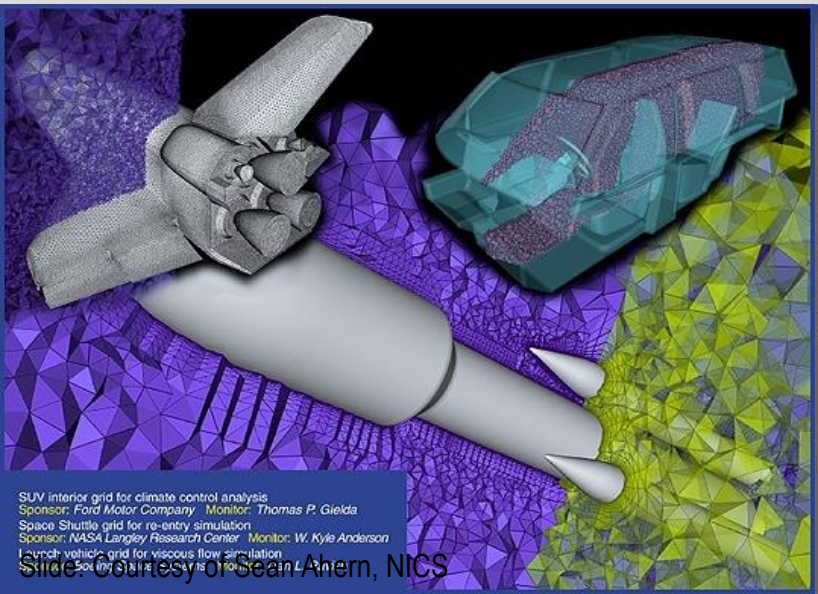
2D: Contours

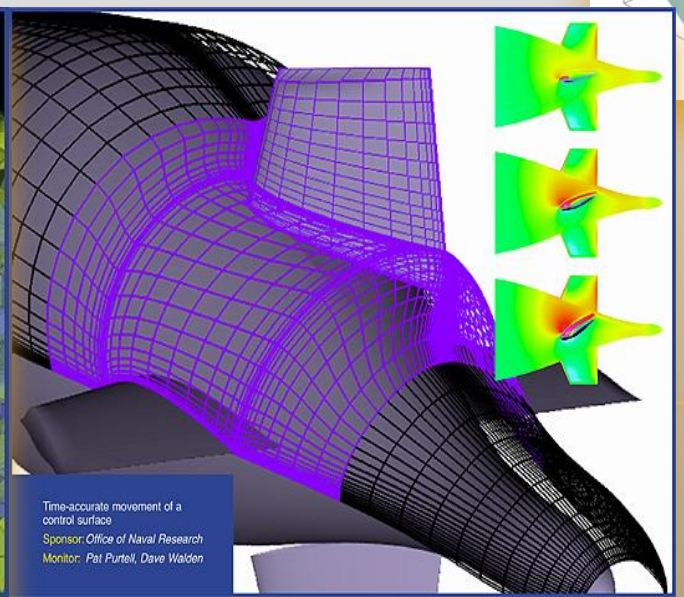
3D: Isosurface (Marching cubes, Marching tetra)

Process: Draw Explicit Geometry (Tri Mesh, Tet Mesh)









Slide: courtesy of Sean Ahern, NICS

VIZ TECHNIQUES: VOLUMETRIC

Process: Volumetrically map scalar data to a transfer function (Color + Opacity)

Utility: To investigate interior/density of scalar volumetric data

Results are very sensitive to

- Transfer Function
- Sampling Interval
- Output Resolution

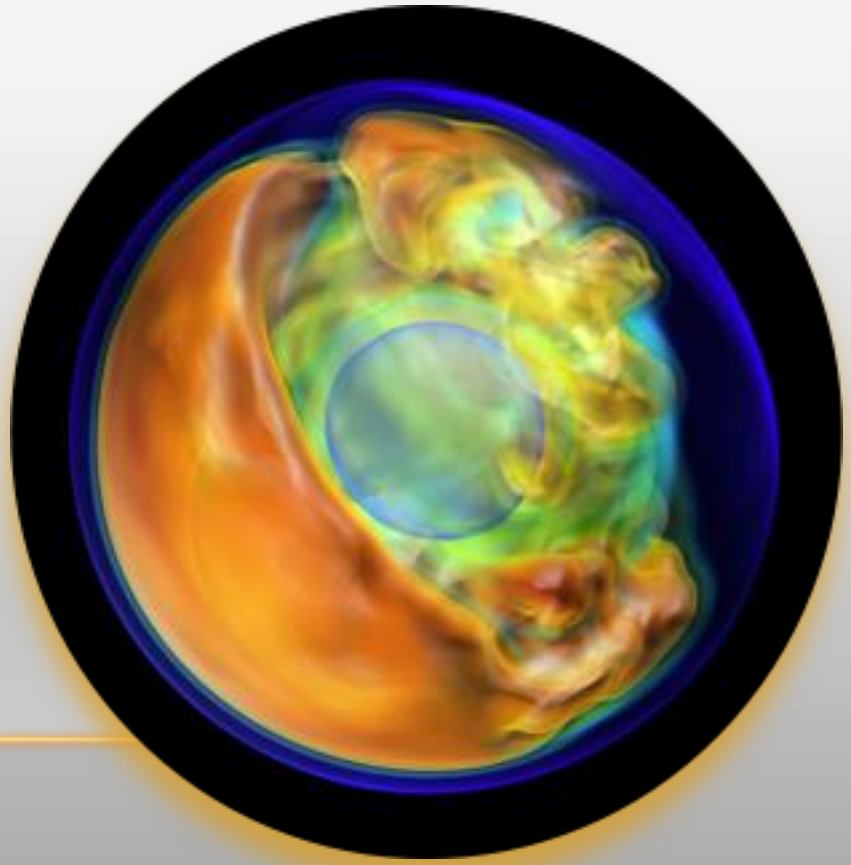


Image: Courtesy of Sean Ahern, NICS

VIZ TECHNIQUES: STREAMLINES

Process: Find curves that are instantaneously tangent to the velocity vector of the flow

Utility: To investigate nature of flow

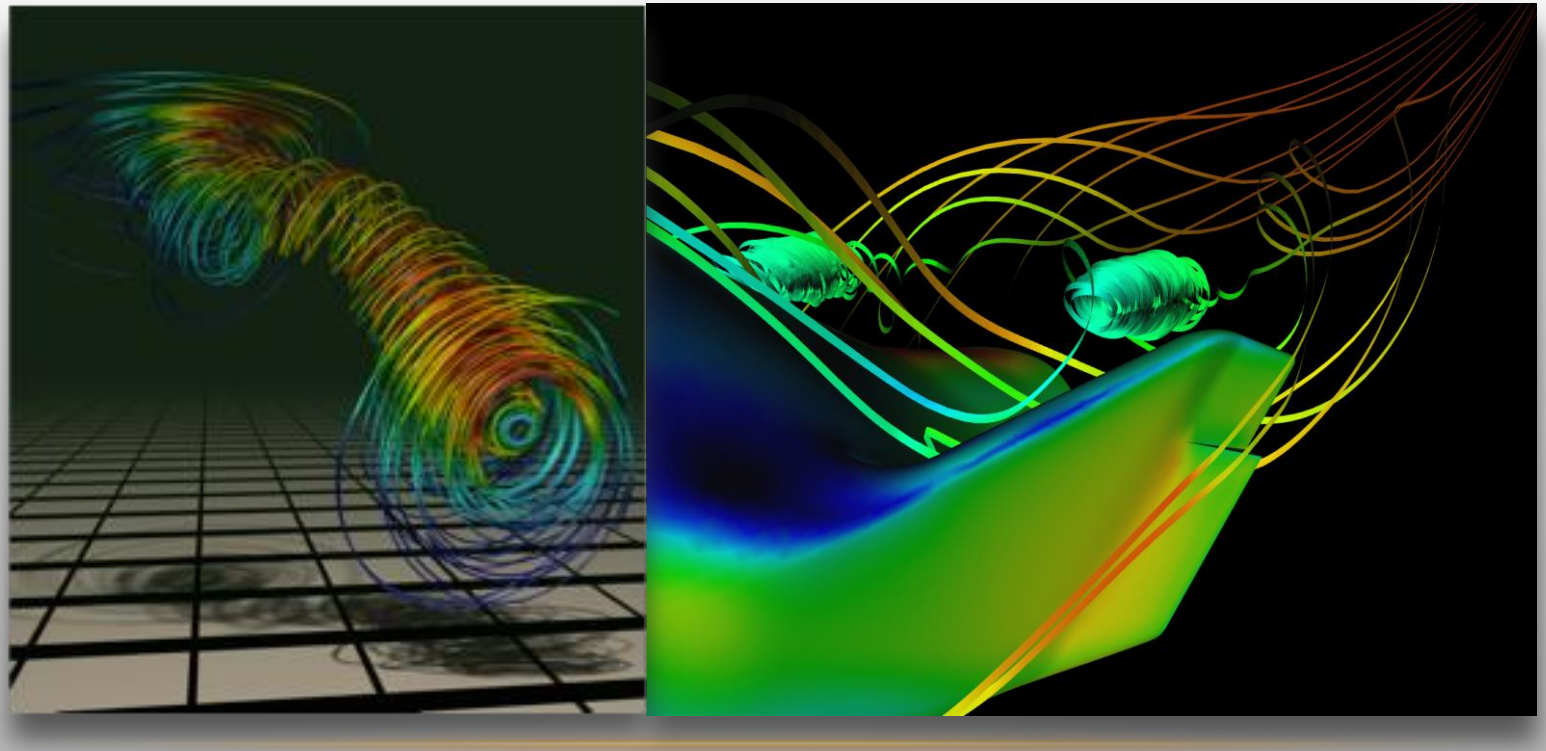
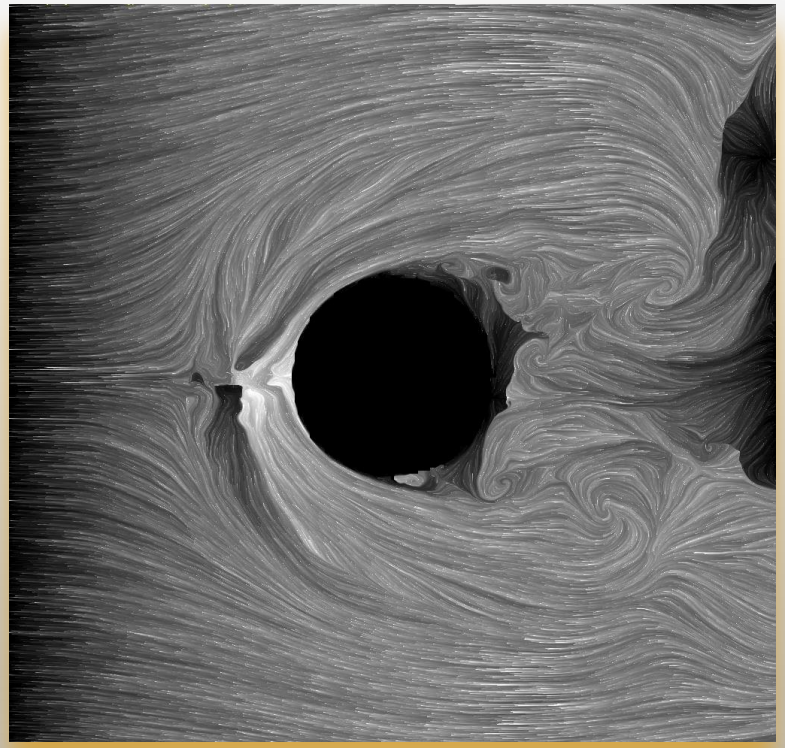


Image: Courtesy of Sean Ahern, NICS

VIZ TECHNIQUES: LIC

Line Integral Convolution

Utility: To investigate nature of flow

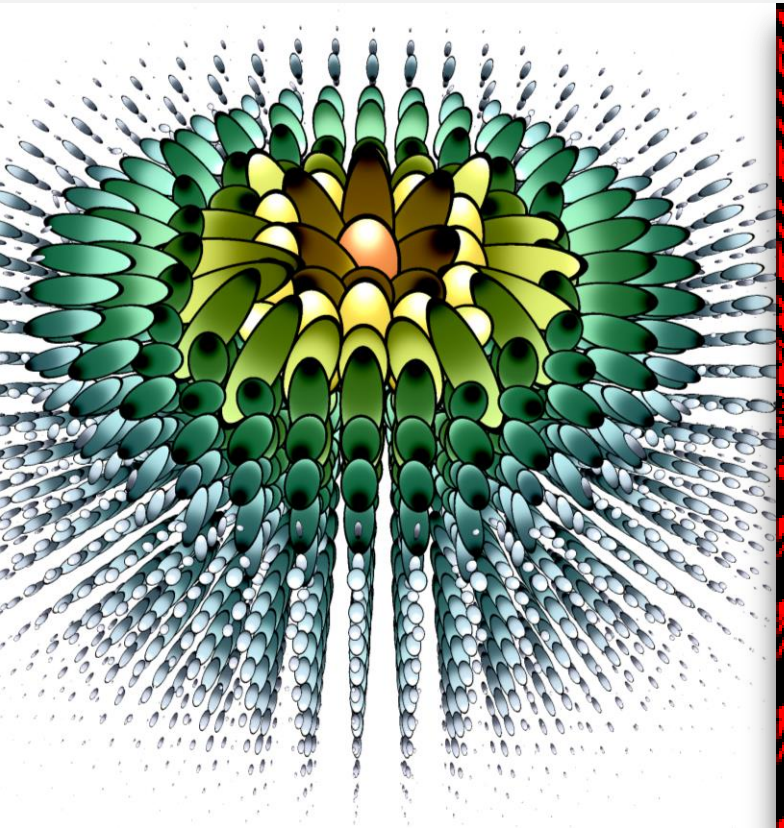


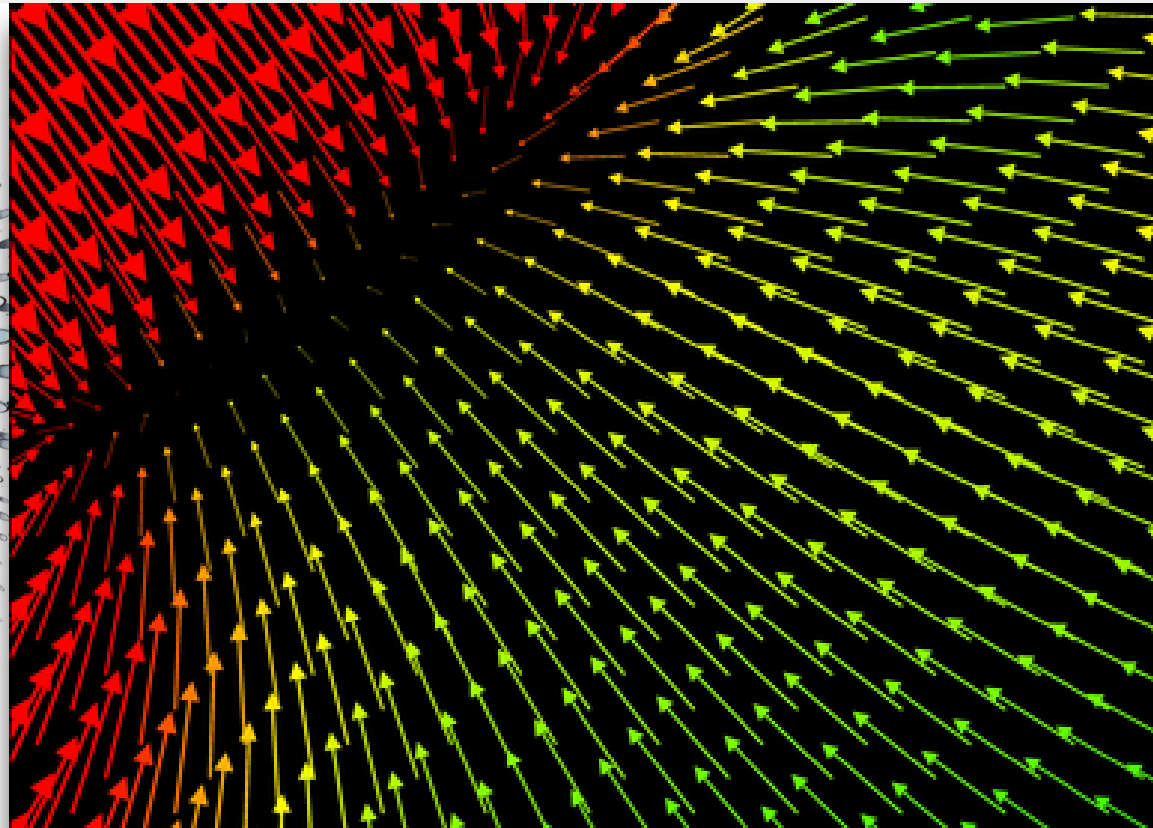
Image/movie: Courtesy of Sean Ahern, NICS

VIZ TECHNIQUES:
GLYPHS

Map the scalar or vector data to a shape

Utility: To investigate flow of vector data or distribution of scalar/vector data

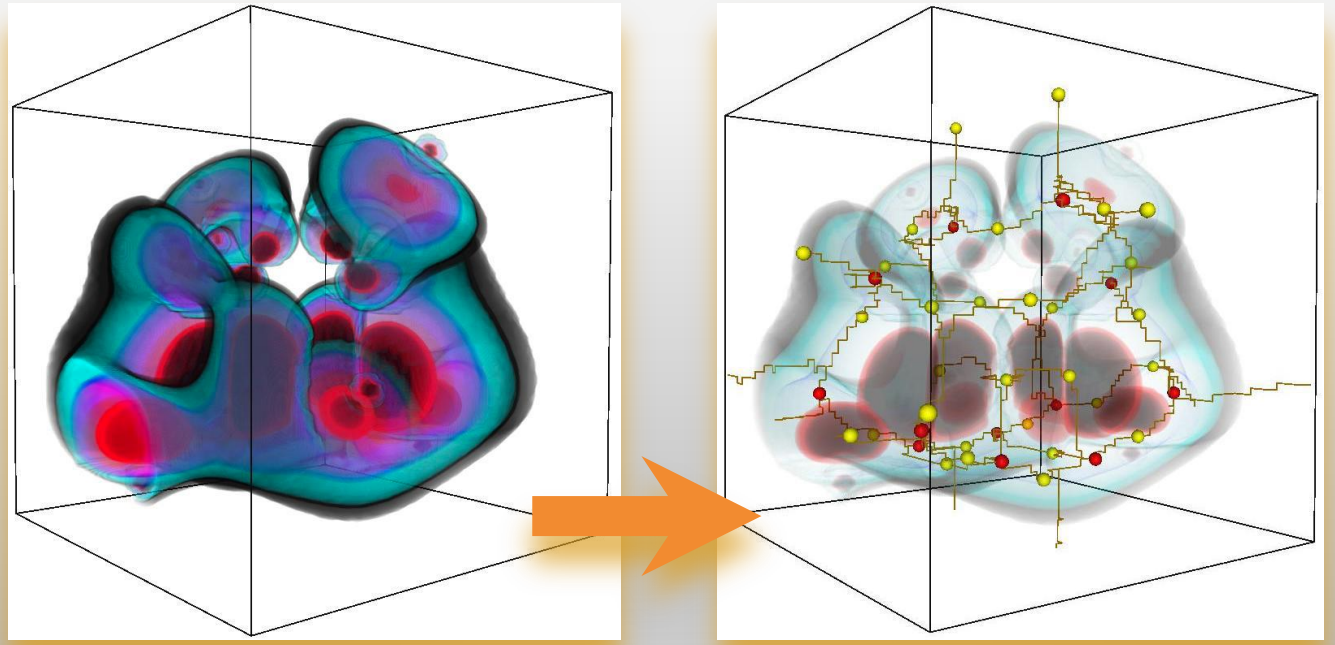




VIZ TECHNIQUES: TOPOLOGICAL

Process: Compute topology of underlying data

Utility: To investigate local maxima, minima, saddle points, etc.



Images: Courtesy of Sean Ahern, NICS

VIZ TECHNIQUES: TENSOR ANALYSIS

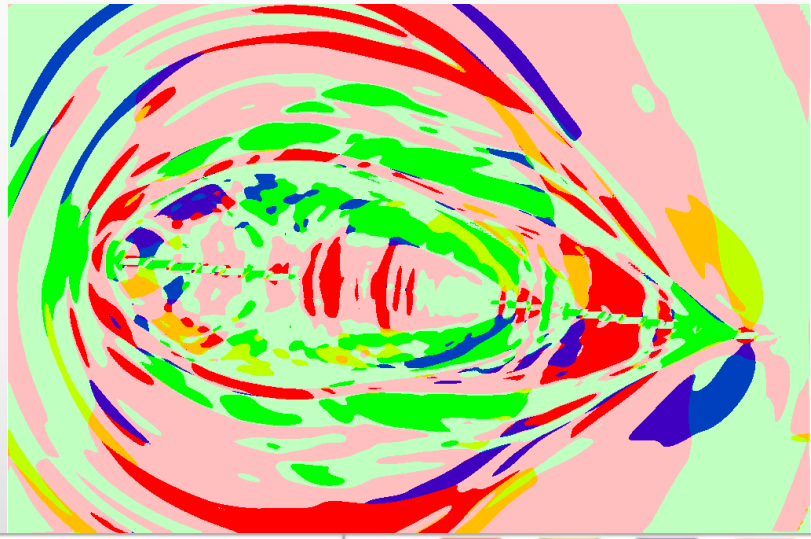
References

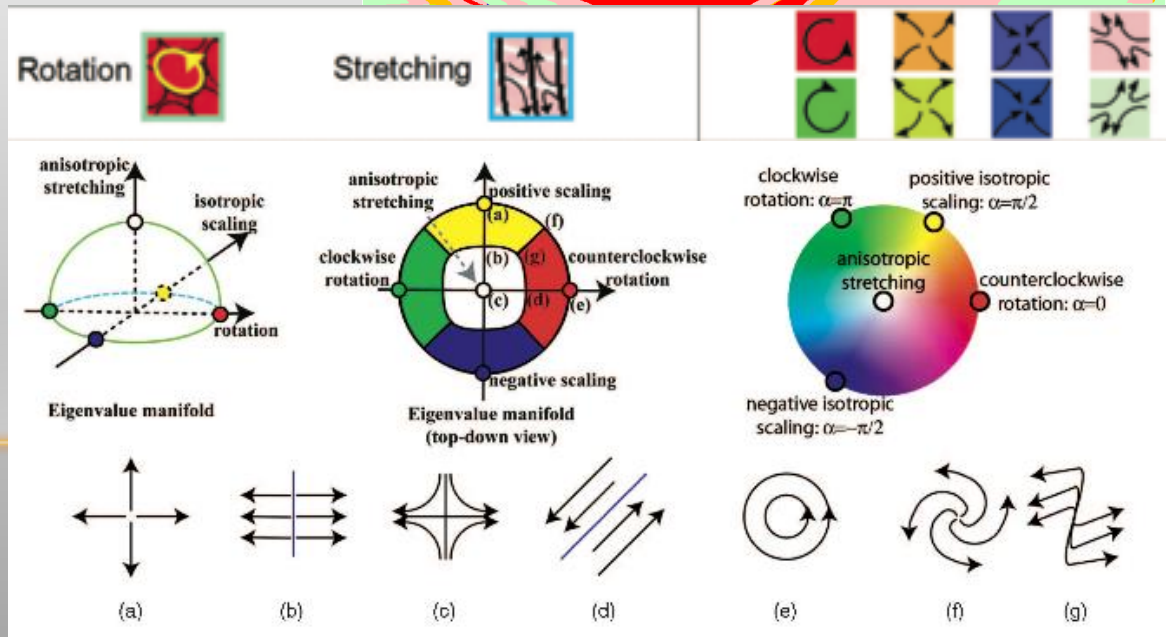
Asymmetric Tensor Analysis for Flow Visualization

Eugene Zhang, Harry Yeh, Zhongzang Lin, and Robert S. Laramee

Asymmetric Tensor Field Visualization for Surfaces

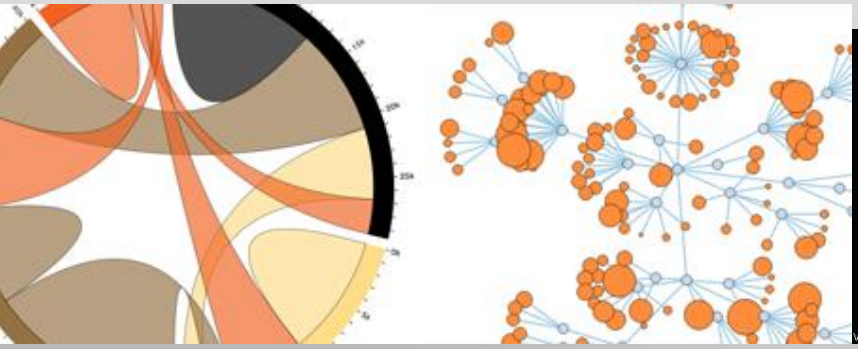
Guoning Chen, Darrel Palke, Zhongzang Lin, Harry Yeh, Paul Vincent, Robert S. Laramee and Eugene Zhang

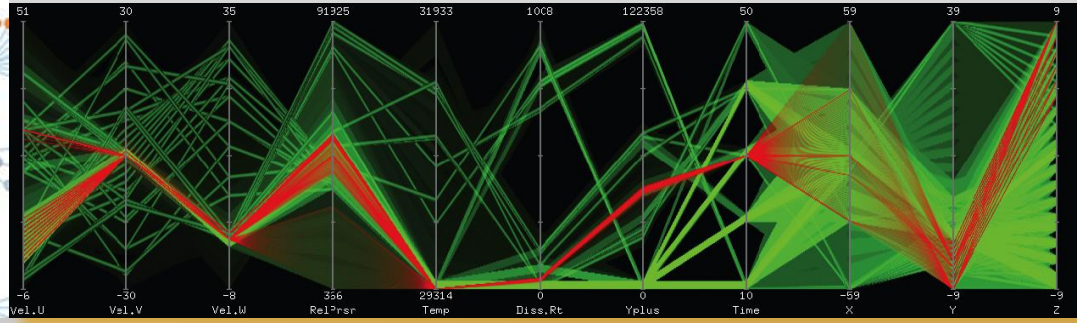




OTHER VIZ TECHNIQUES

- **Parallel Coordinates**
- Chord
- Tree (e.g., Dendograms, Sunbursts, Treemaps, etc.)
- Many others



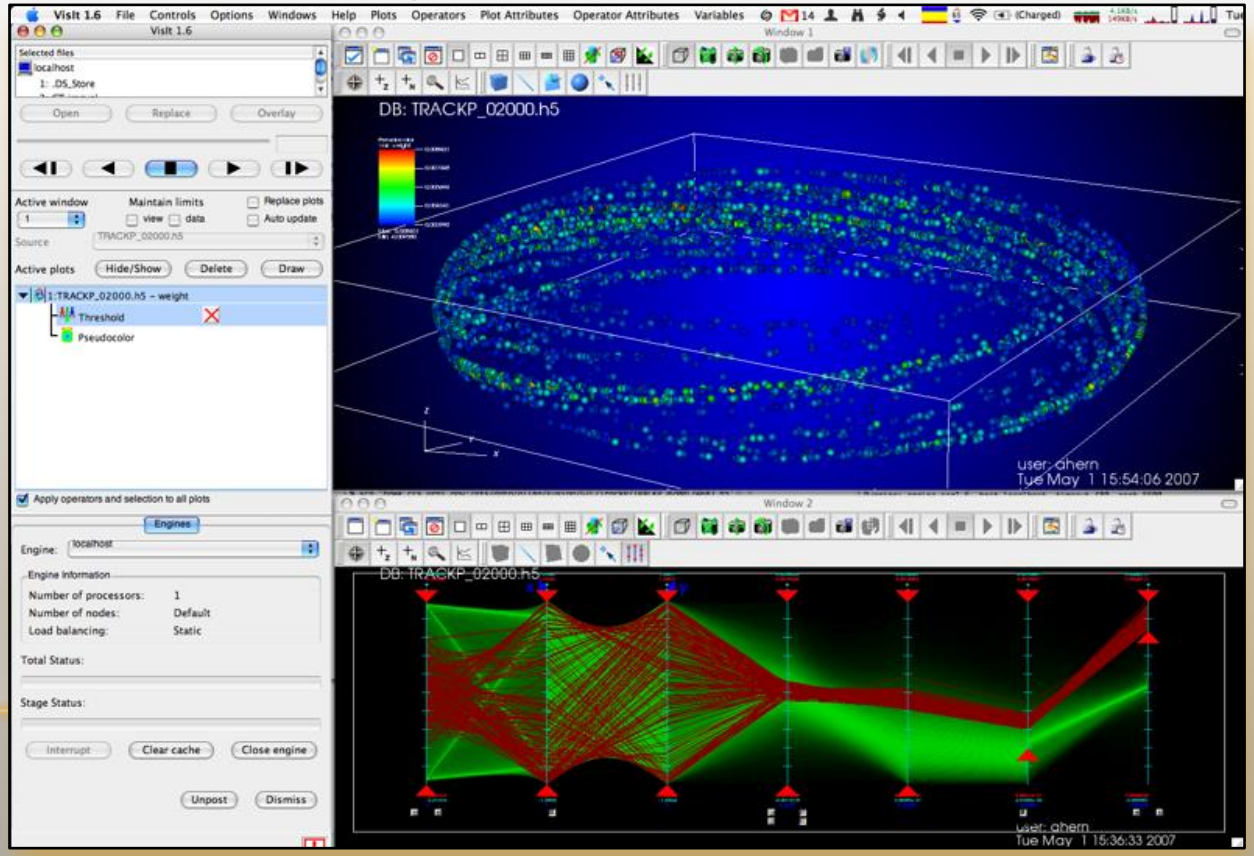


Source: https://github.com/mbostock/d3/wiki/Gallery

HIGH-DIMENSIONAL VISUALIZATION

Parallel coordinates summarize high-dimensional information

Utility: To find trends and relationships



VISUALIZATION APPLICATIONS

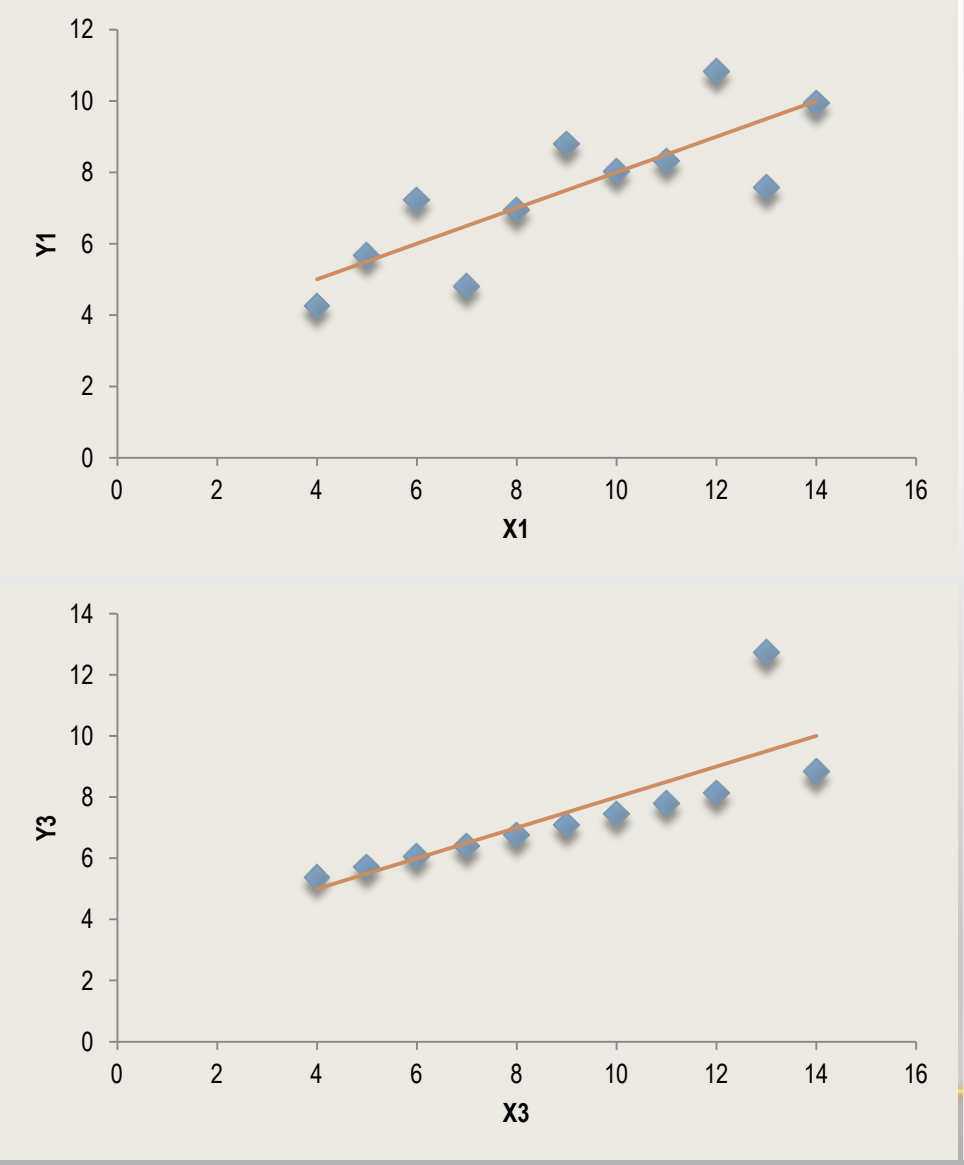
- Communication
- Confirmation
- Inspection and Exploration

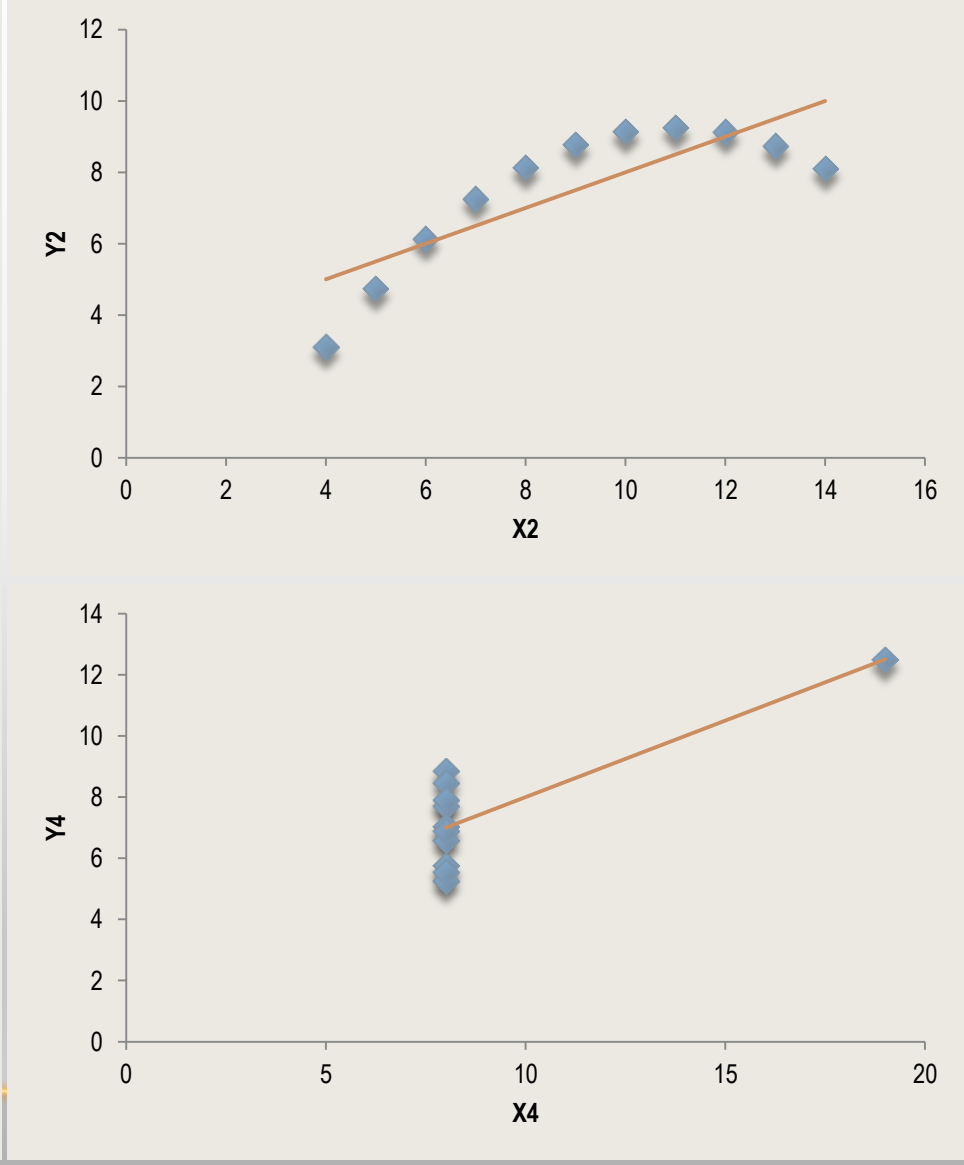
APPLICATION OF VIZ -CONFIRMATION

I		II		III		IV	
x1	y1	x2	y2	x3	y3	x4	y4
10	8.04	10	9.14	10	7.46	8	6.58
8	6.95	8	8.14	8	6.77	8	5.76
13	7.58	13	8.74	13	12.74	8	7.71
9	8.81	9	8.77	9	7.11	8	8.84
11	8.33	11	9.26	11	7.81	8	8.47
14	9.96	14	8.1	14	8.84	8	7.04
6	7.24	6	6.13	6	6.08	8	5.25
4	4.26	4	3.1	4	5.39	19	12.5
12	10.84	12	9.13	12	8.15	8	5.56
7	4.82	7	7.26	7	6.42	8	7.91
5	5.68	5	4.74	5	5.73	8	6.89

mean(X) = 9, **variance**(X) = 11
mean(Y) = 7.5, **variance**(Y) = 4.12
linear regression lineY = 3 + 0.5*X
correlation(X,Y) = 0.816

Anscombe's Quartet



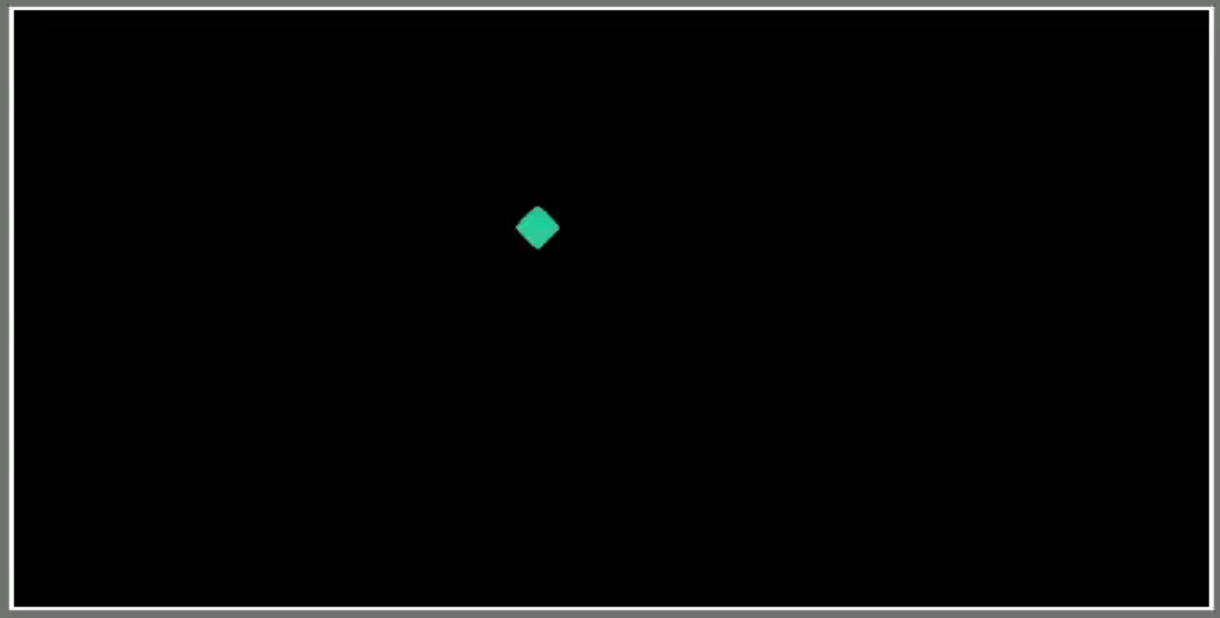


Anscombe 1973,TheAmerican Statistician

APPLICATION OF VIZ
- INSPECTION AND EXPLORATION

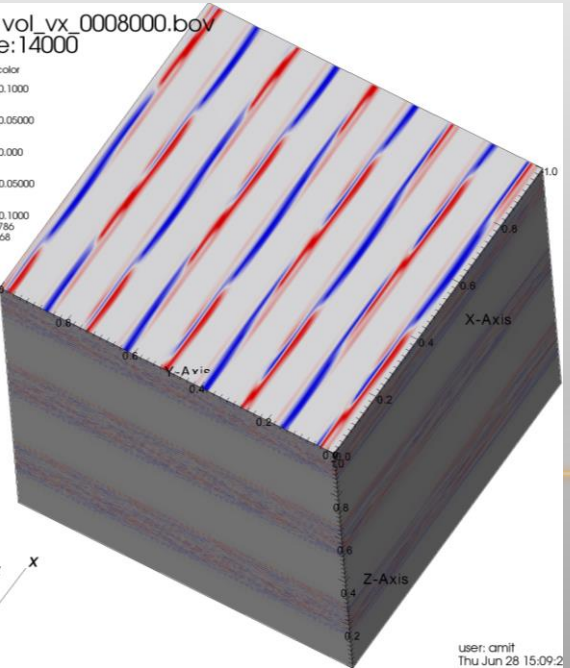
SALIENT APPLICATIONS OF VISUALIZATION

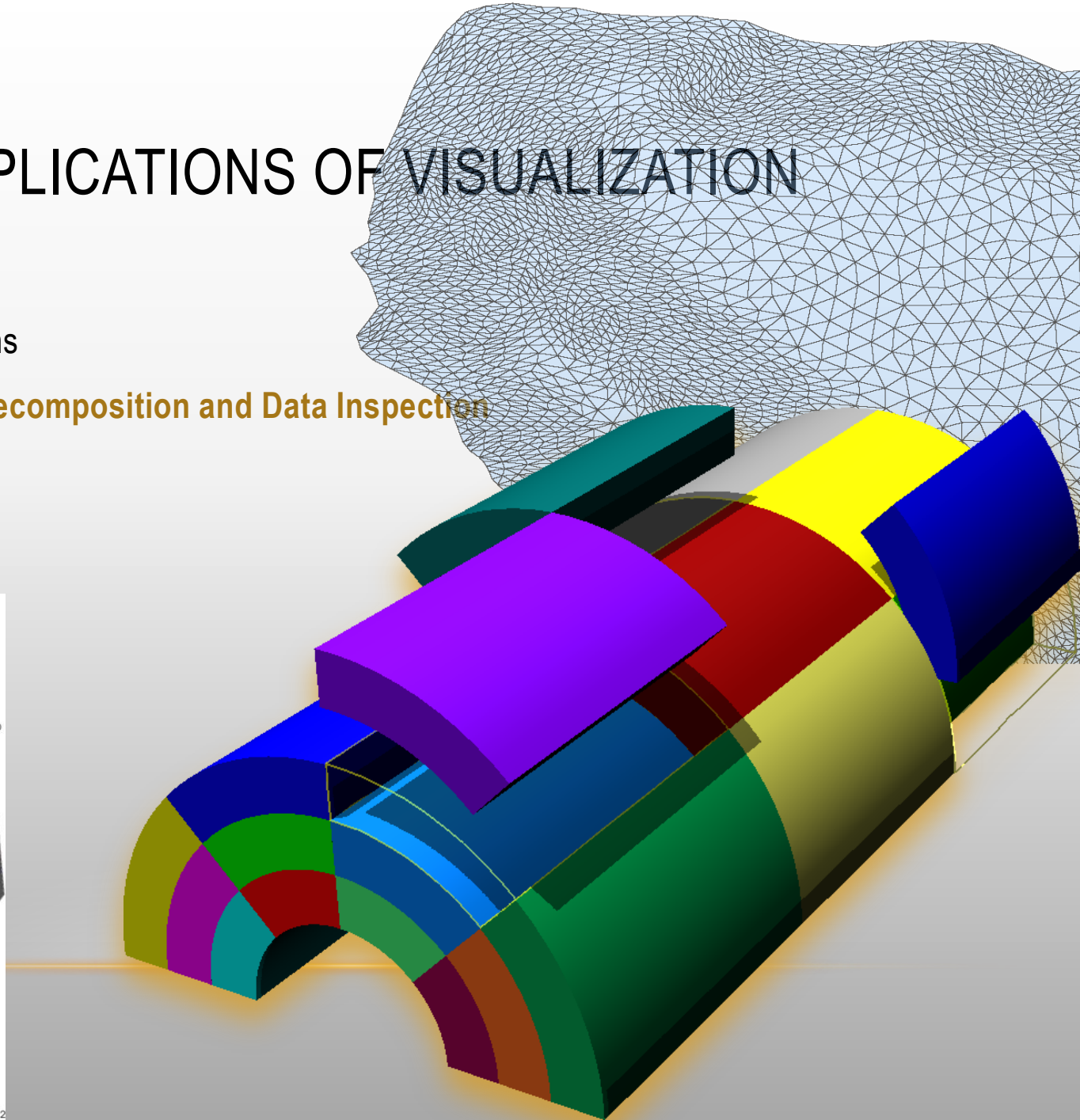
- **“NaN” Inspection**
- **Boundary Conditions**



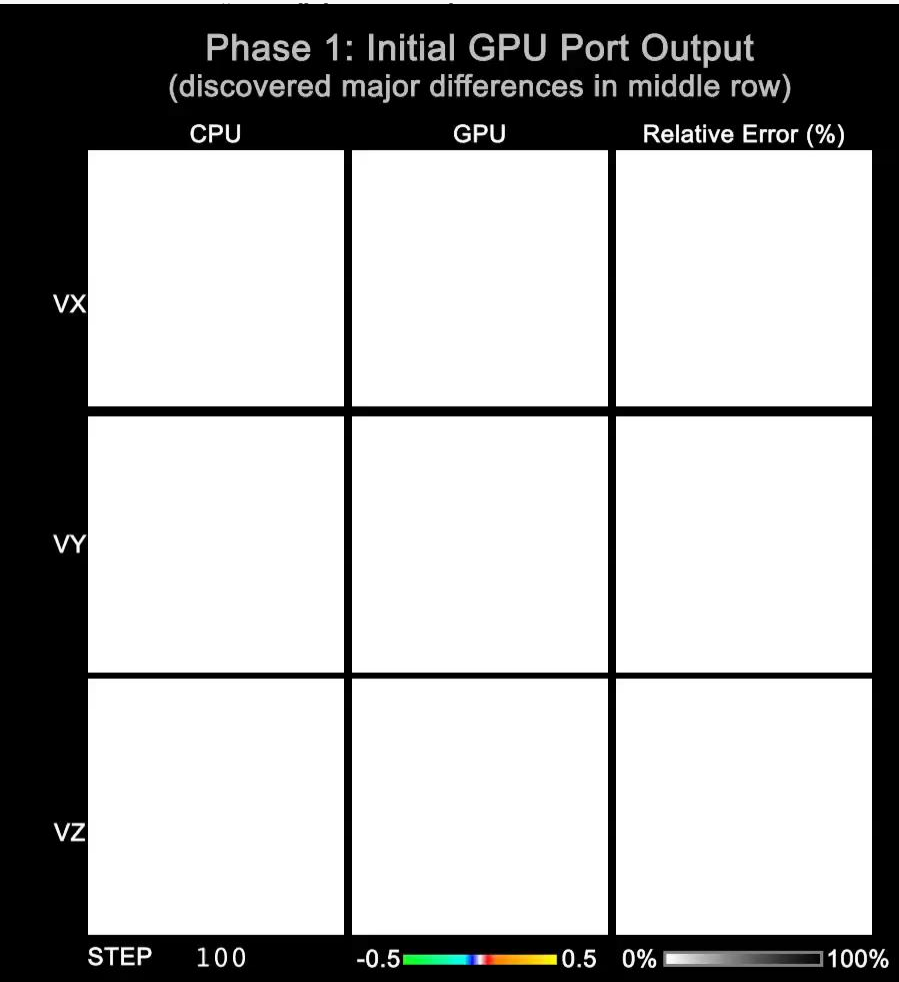
SALIENT APPLICATIONS OF VISUALIZATION

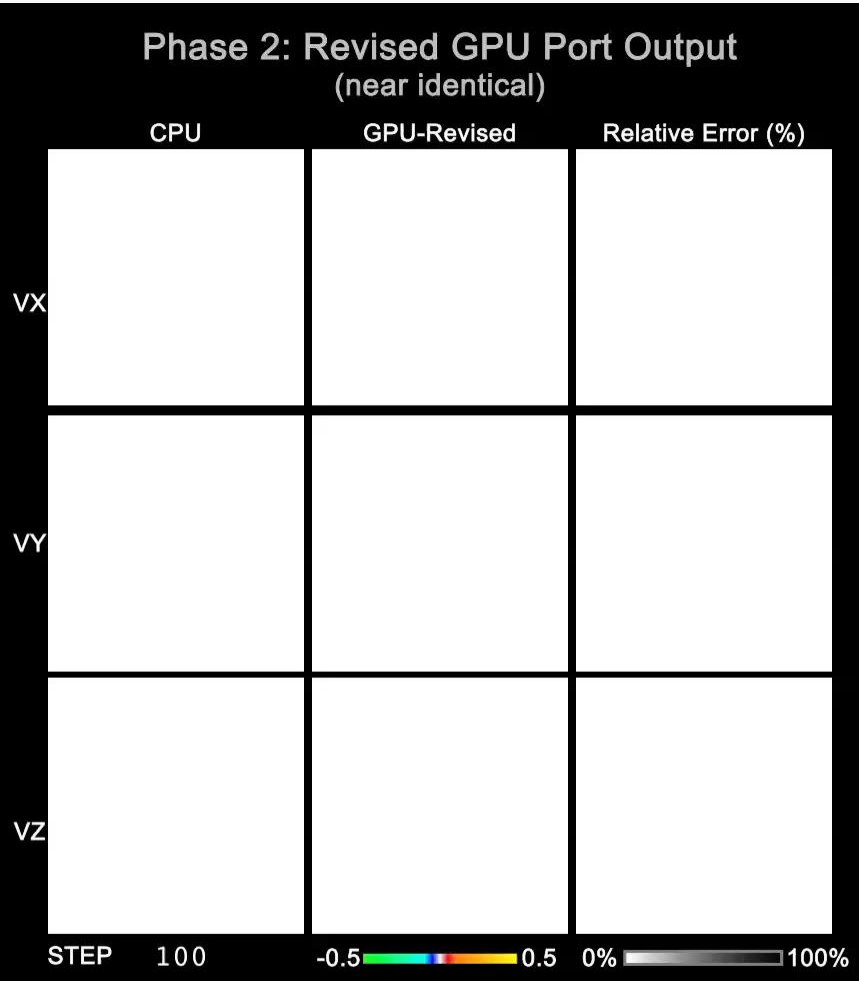
- “NaN” Inspection
- Boundary Conditions
- **Mesh Topology, Decomposition and Data Inspection**





SALIENT APPLICATIONS OF VISUALIZATION

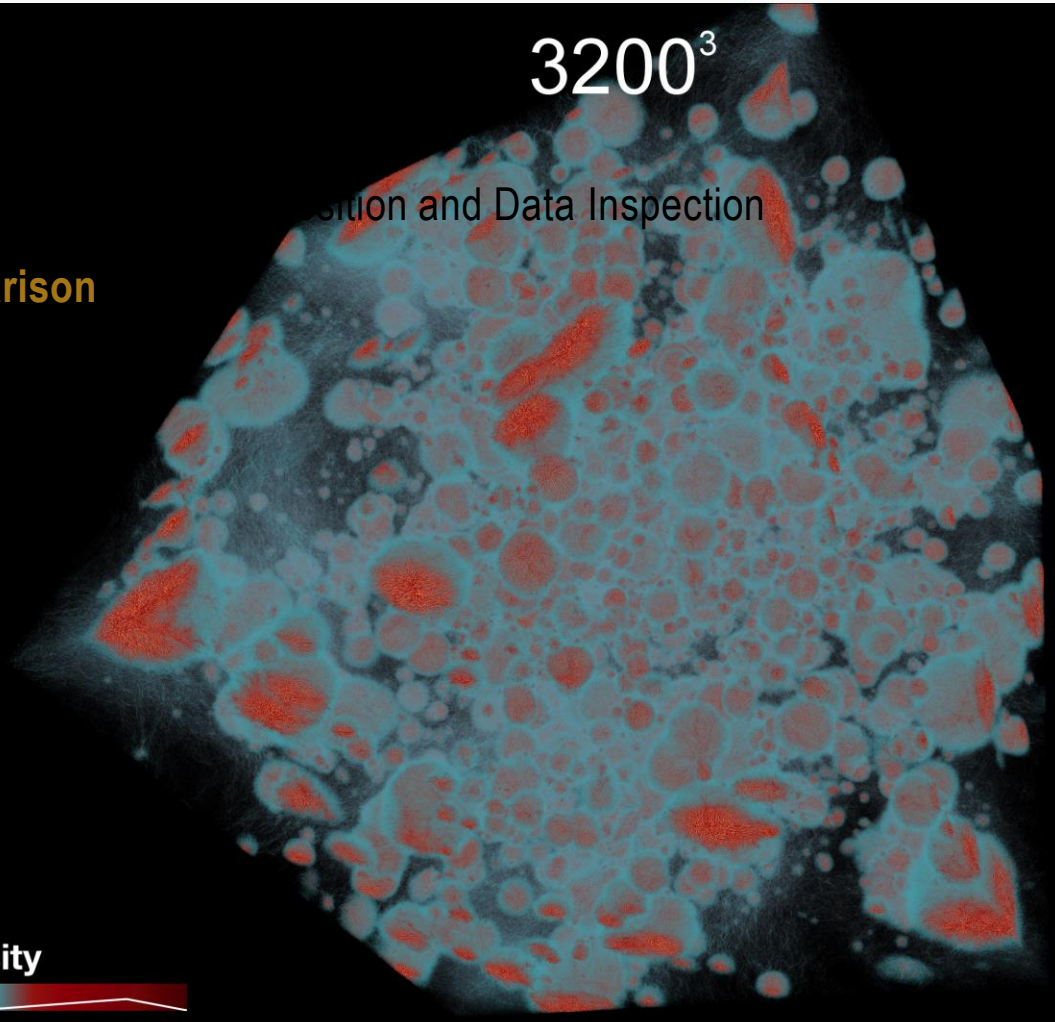




SDSC

SALIENT APPLICATIONS OF VISUALIZATION

- 3200^3
- sition and Data Inspection
- **Comparison**



Density

Non-Radiative | No Difference | Radiative

SDSC
SAN DIEGO SUPERCOMPUTER CENTER

Argonne
NATIONAL LABORATORY

SALIENT APPLICATIONS OF VISUALIZATION

- “NaN” Inspection
- Boundary Conditions
- Mesh Topology, Decomposition and Data Inspection
- Comparison
- **Collisions and Mergers**

“Deep Sea Adventure” Cal Tech, NCSA, ADLER PLANETARIUM

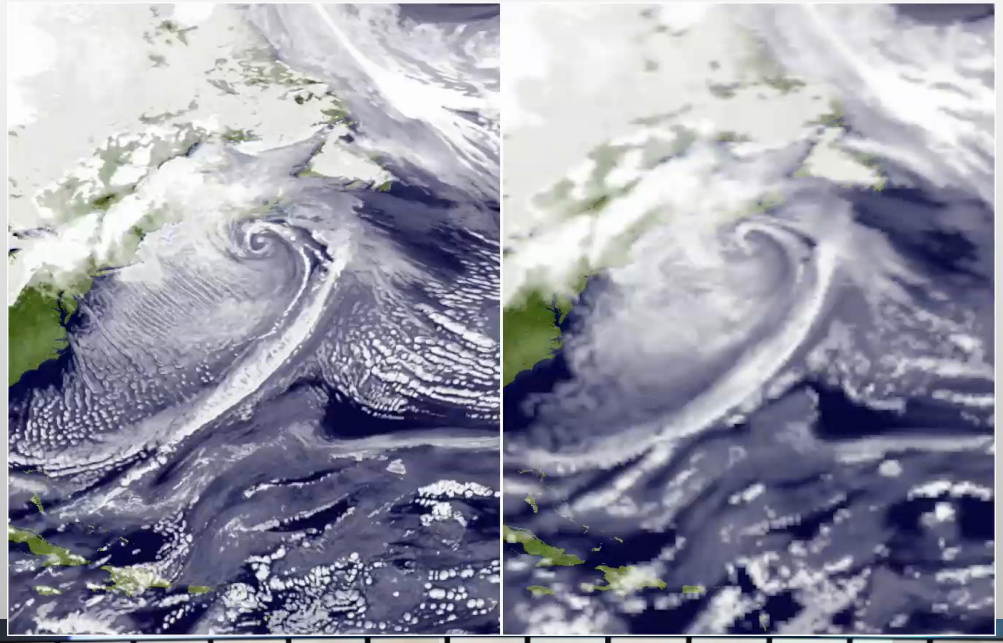
SALIENT APPLICATIONS OF VISUALIZATION

SCEC an NSF+USGS center SDSC

Source: http:jazzroc.wordpress.com/category/contrails/

DISPLAYING DATA

- High resolution devices (latest tablets and laptops)
- High resolution monitors (30” flat panels, 4 megapixel, 2500x1600)
- Tile Displays (array of monitors)

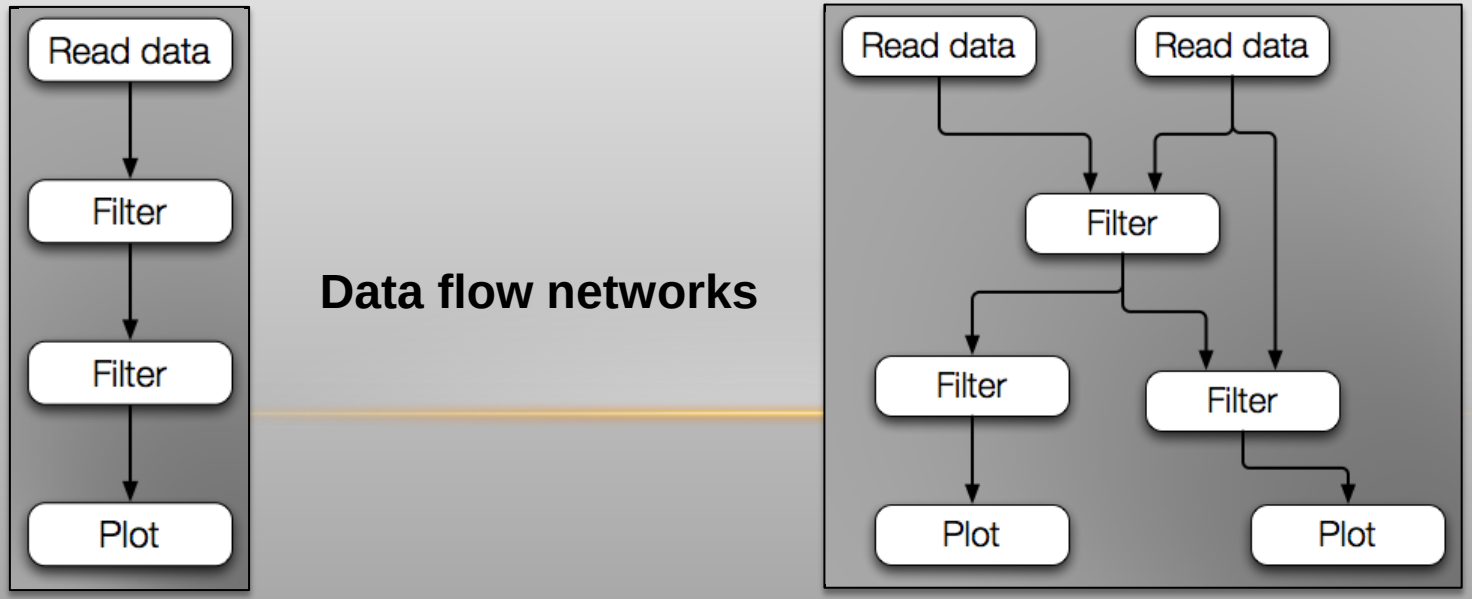


Slide: Courtesy of Sean Ahern, NICS

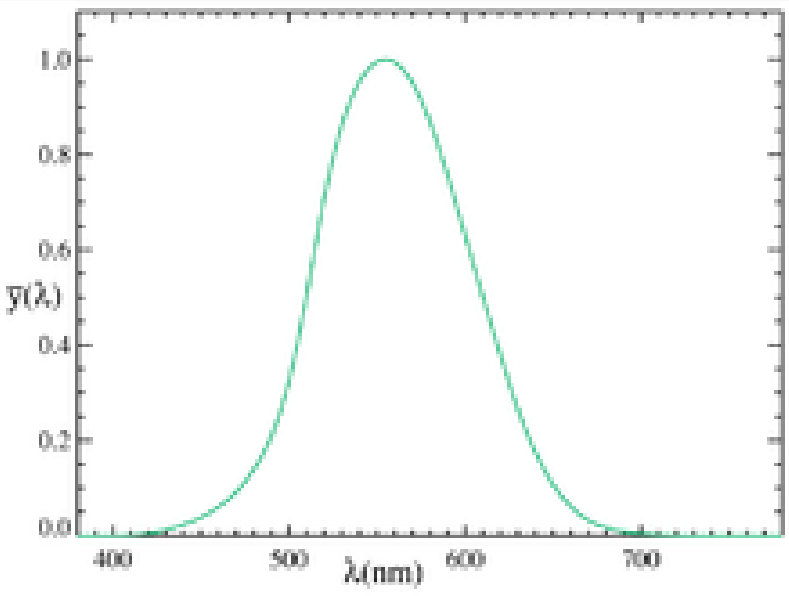
MISCELLANEOUS

FLOW NETWORKS (PIPELINES)

- Data reading: NetCDF, HDF, text, CSV, PDB
- Data operations: Slicing, resampling, mesh transforms
- Data plotting: Pseudocolor, isosurface, volume rendering



HUMAN EYE SENSITIVITY



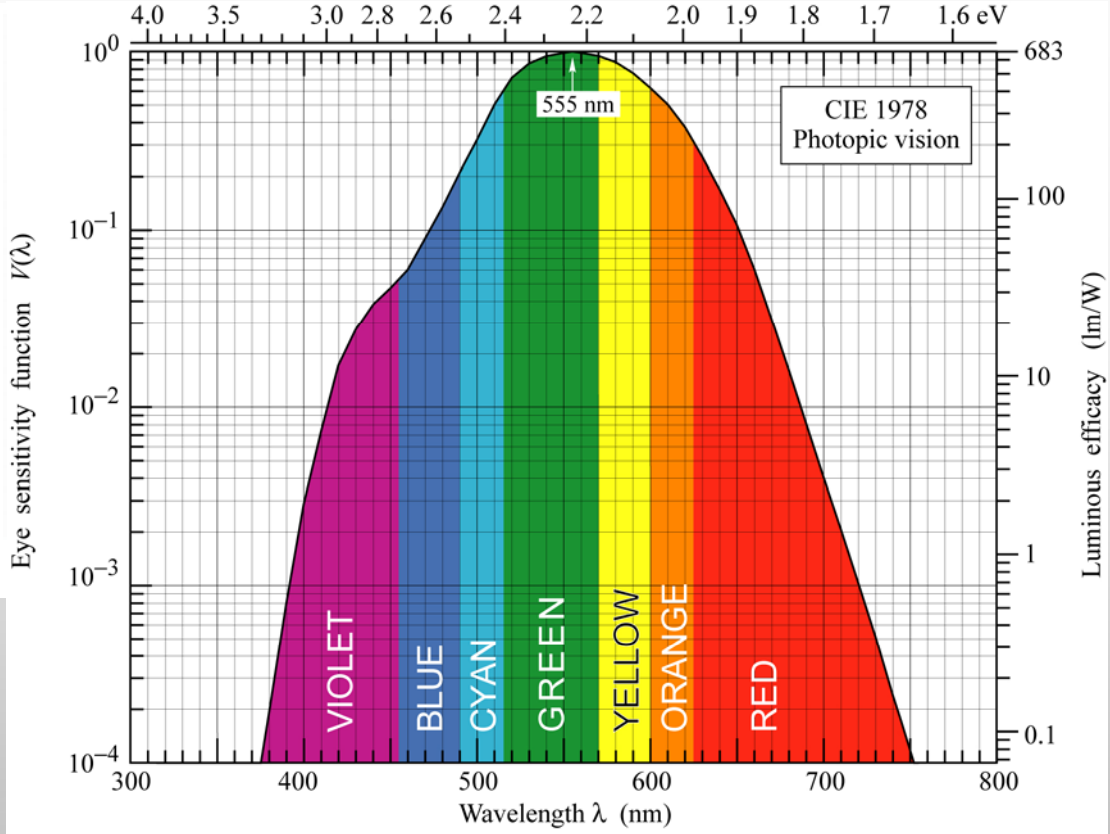


Fig. 16.7. Eye sensitivity function, $V(\lambda)$, (left-hand ordinate) and luminous efficacy, measured in lumens per watt of optical power (right-hand ordinate). $V(\lambda)$ is maximum at 555 nm (after 1978 CIE data).

Image: Photopic Vision

E. Fred Schubert, "Light Emitting Diodes: Chapter 16 Human eye sensitivity and photometric quantities", page 282

BEST PRACTICES

- Colors
  - Grey scale is excellent at many things.
  - Good Color map design:
    - colorbrewer2.org (excellent)
    - kuler.adobe.com
    - Use HSV color scale for color map design and interpolation
  - vischeck.com (About 8% males are color blind)

  Don't use rainbow color map: http://blog.visual.ly/rainbow-color-scales/
- Always include legend and captions
- Carefully set Sampling, Interpolation and Seeds
- Exploit Underlying Data Organization (Linear, Tabular, Hierarchical, Network, Geographic, Other)
- Add embellishments (**only**) to improve legibility and to provide context
- Use 3d when it adds value
- Write data in parallel read friendly format
- Reduce/Minimize Data Movement: **Visualize as close to the data as possible**

VIZ LIMITATIONS

- Domain knowledge
- Interpolation scheme
- High dimensional data
- Temporal coherence
- Precision loss (abstraction and compression)
- Perceptual issues (color blindness, stereopsis, …)
- Personal bias (author & viewer)

-

VIZ MISCONCEPTIONS	Busted!
Pretty Pictures	Sometimes a side effect
I am not an artist thus can't do viz ---------- ----------	Stick around. Try again and ask for help this time
Viz is an art not science ----------	Viz is driven by algorithms, some very sophisticated
Viz is a one time task	Viz is a process like any other analysis
Viz is useful only for communication -------- ----------	Use in error diagnostics, explore data for trends, outliers & insight

Welcome to Viz World

REQUESTING HELP

- Submit tickets at XSEDE
- Request Extended Collaborative Support Service (ECSS) with your allocation
  - Provides free people time on your research work

Q & A

Make sure you have

VisIt (2.5.2), Download location: http://visit.llnl.gov/executables.html

Sample Data, Download location: https://wci.llnl.gov/codes/visit/2.3.0/VisItClassData.zip

Unzip sample data to your Desktop

SESSION 2: VISUALIZATION WITH VISIT (HANDS ON)

Session 2: Visualization Hands On

Make sure you have

VisIt (2.5.2*): http://visit.llnl.gov/executables.html

***Preferred version**

Sample Data: Unzip sample data to your Desktop

https://wci.llnl.gov/codes/visit/2.3.0/VisItClassData.zip

Sphere Data http://users.sdsc.edu/~amit/forums/sphere.zip

VISIT SOFTWARE

Originally developed at LLNL (year 2001 onwards), now a community effort

Strengths

- Cross platform
- Open and freely available
- Versatile (supports many mesh types, reads over 100 data formats)
- Local, Remote, Client-Server
- Supports large data (scalable)
- Interactive, Command Line, & Batch
- Extensible via C++, Java, & Python

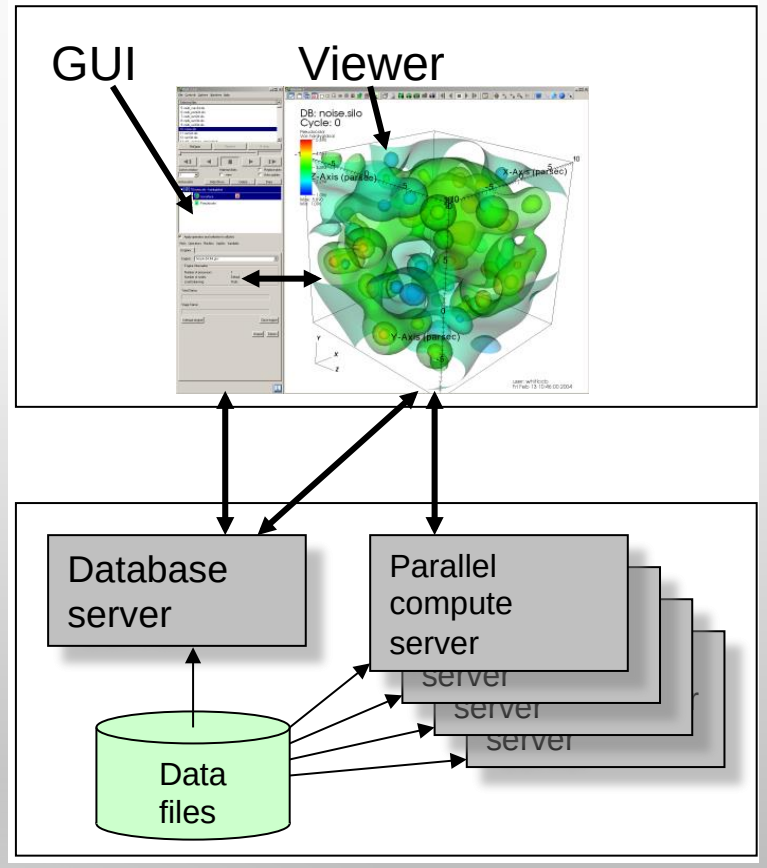
Source code, executable and documentation available at http://www.llnl.gov/visit

Trivia: VisIt name is play on words "**Vis**ualize **It**"

VISIT ARCHITECTURE

Four Main Components

- GUI (main window)
- Viewer (visualization or plot window)
- Database server
- Compute engine



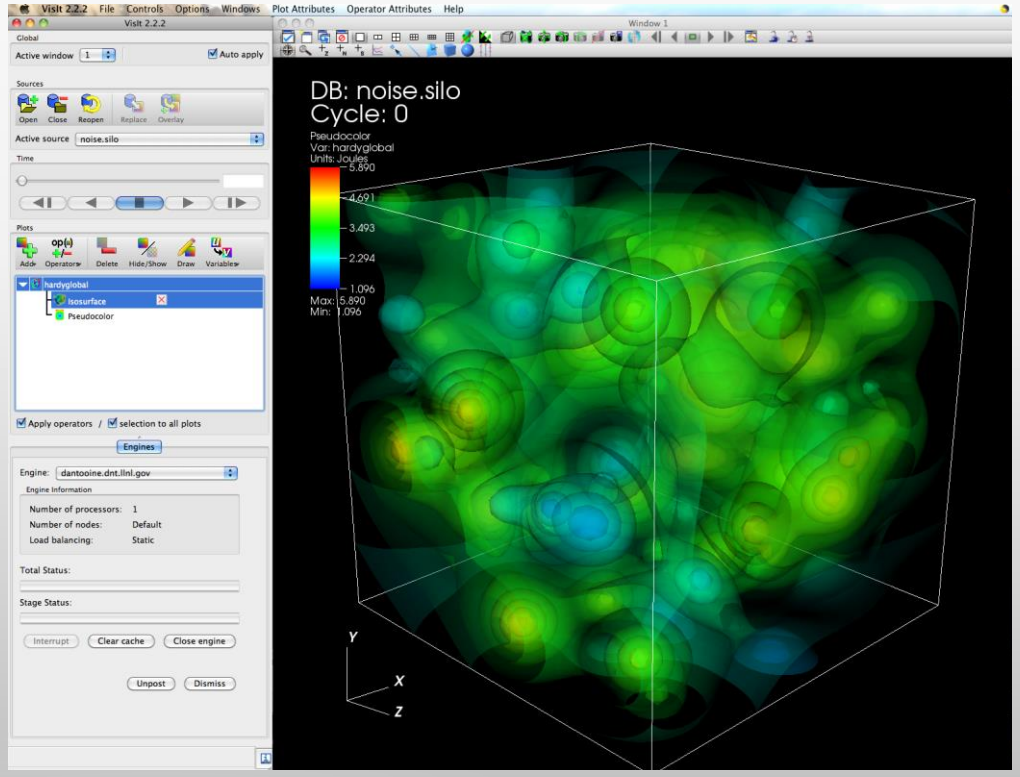
VISIT'S MAIN WINDOWS

GUI

- Select files to visualize
- Create and manage plots
- Set plot attributes
- Add operators
- Set look and feel for visualization

Viewer

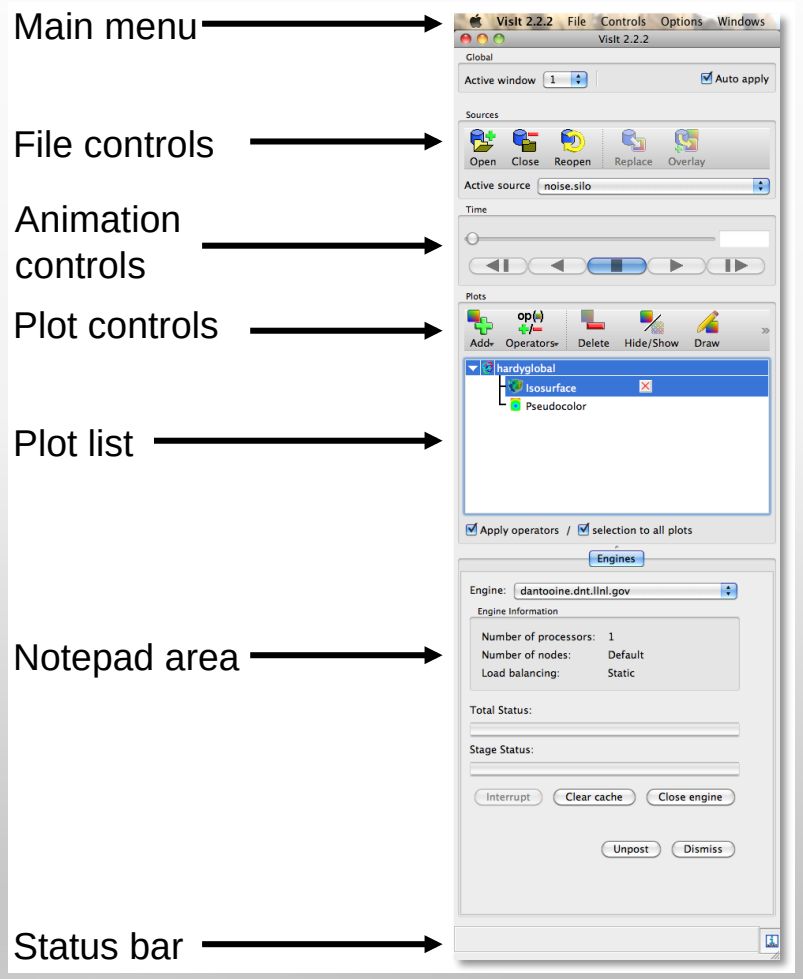
- Viewer windows, or vis windows, display all of the data being visualized
- Mouse navigation
- Up to 16 vis windows
- Popup menu
- Toolbars



MAIN WINDOW

GUI or Main window

- Open files
- Access other controls
- Set time state
- Create and manage plots
- Display plot progress



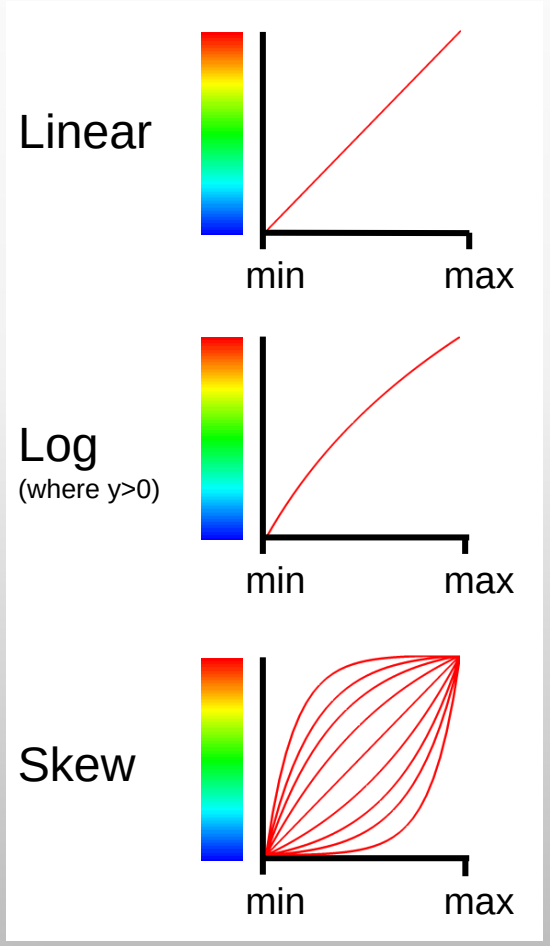
VISUALIZATION RECIPE FOR VISIT

1. Open database (file or set of files)
2. Create a plot
3. Set plot attributes
4. Apply operators to plot to modify data
5. Set operator attributes
6. Change refine view

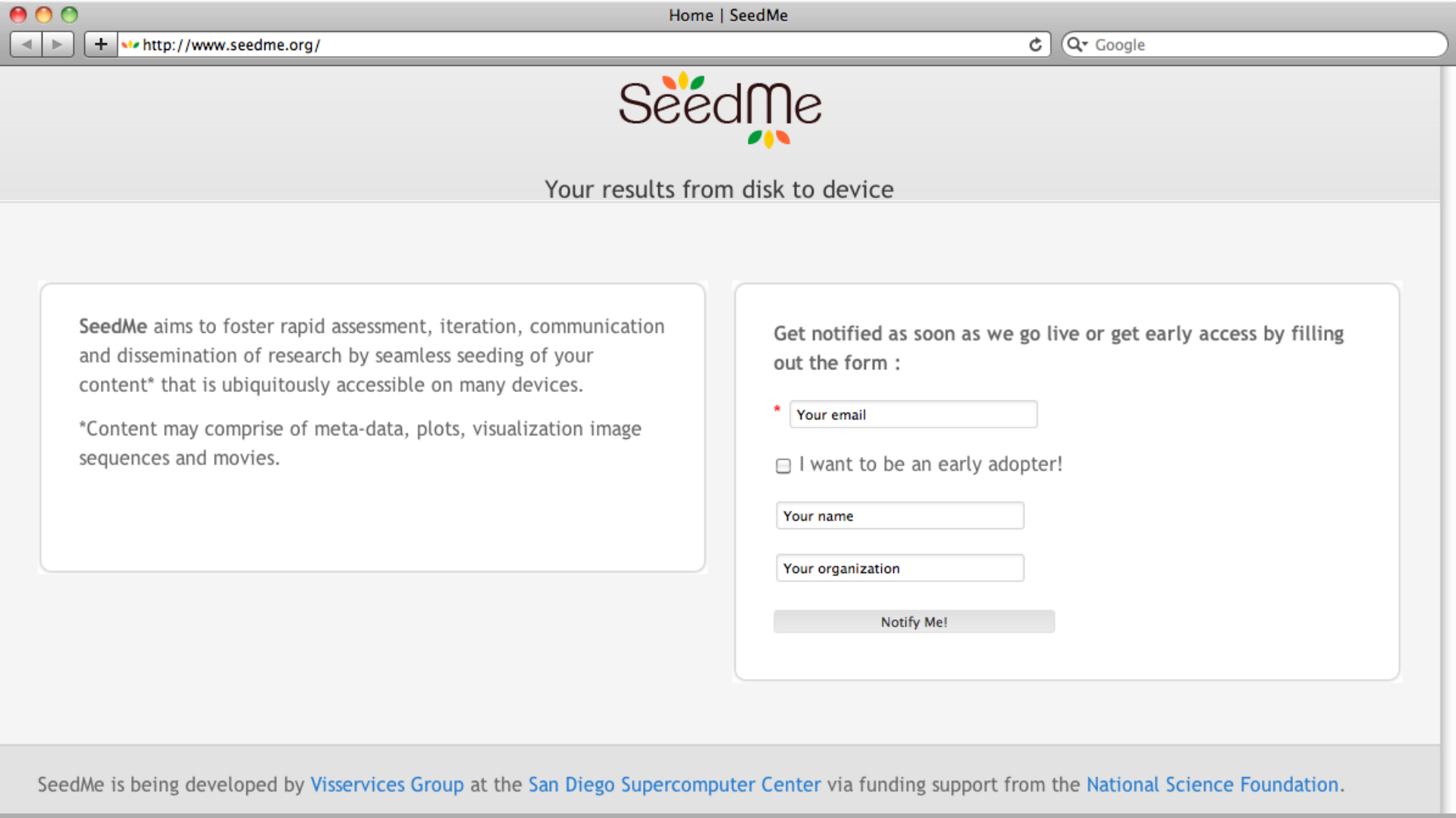
SCALING OPTIONS IN VISIT

Scaling tells VisIt how to map values to color

- Linear scaling maps data range evenly to color range
- Log scaling assigns more low data values to color range (Values must be > 0)
- Skew scaling can assign either high or low values to color range using a skew factor



SEEDME.ORG


Home | SeedMe
http://www.seedme.org/
Google
SeedMe
Your results from disk to device
SeedMe aims to foster rapid assessment, iteration, communication and dissemination of research by seamless seeding of your content* that is ubiquitously accessible on many devices.
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SESSION 1B: REMOTE VISUALIZATION VISIT ON GORDON (HANDS ON)

TEST ACCESS TO GORDON

SSH to Gordon

% ssh USERNAME@gordon.sdsc.edu

% module list

Note: VisIt does not use default modules on Gordon

VISIT PATH ON GORDON

/opt/visit

Find versions of visit installed on Gordon

Server -Client compatibility
2.5.x - 2.5.x
2.4.x - 2.4.x
2.3.x - 2.3.x

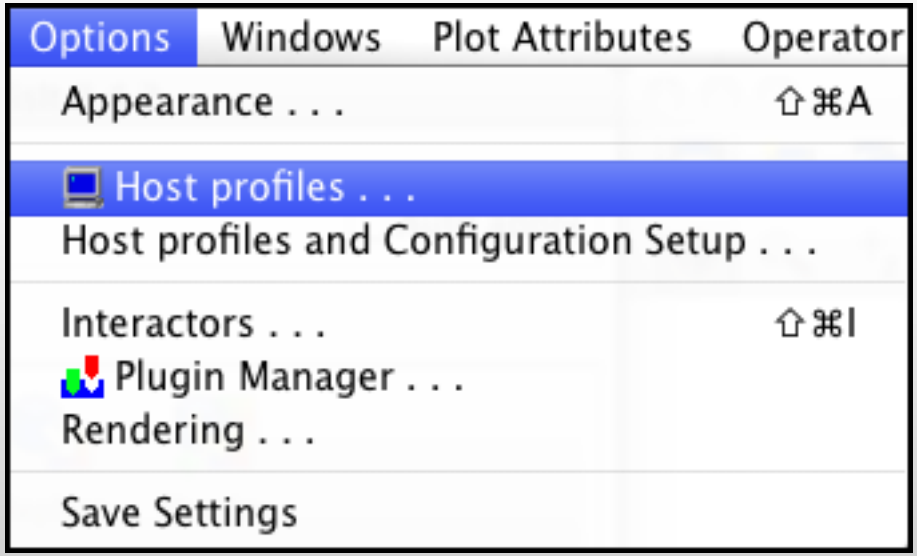
Bank/Account/Allocation: GUE998

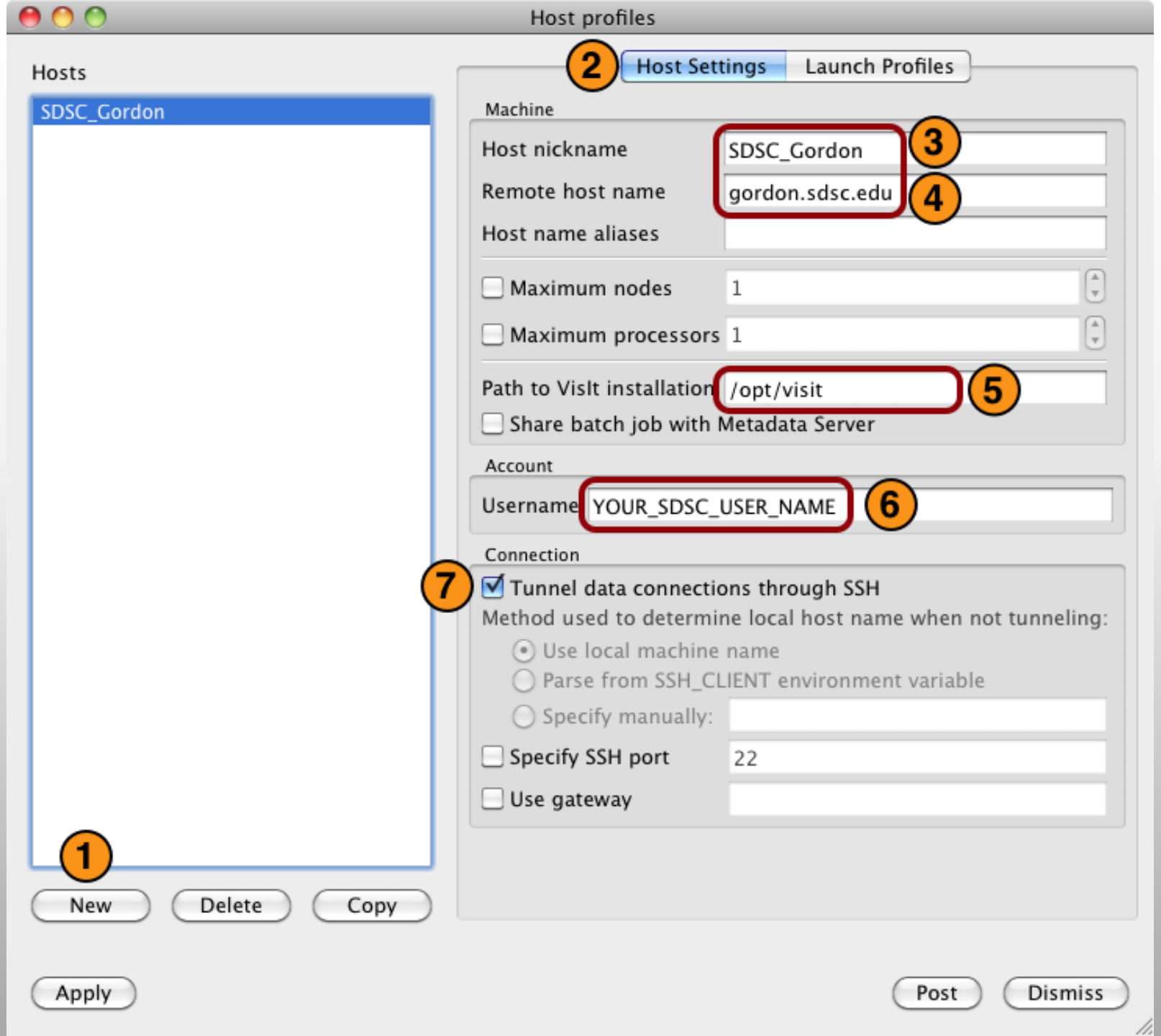
USING VISIT ON GORDON

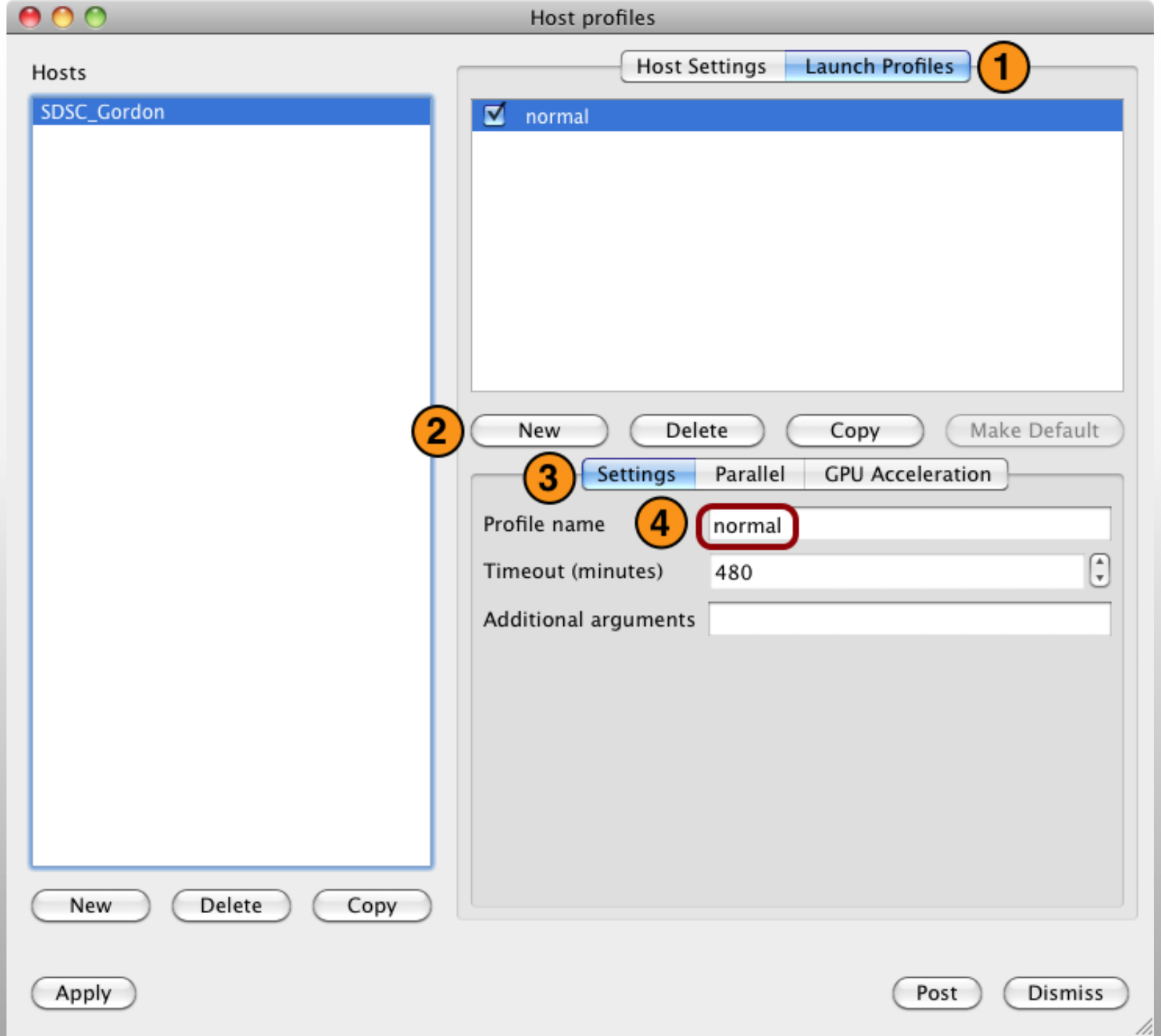
Create Host Profile for Gordon in VisIt
Connect and use VisIt in server client mode

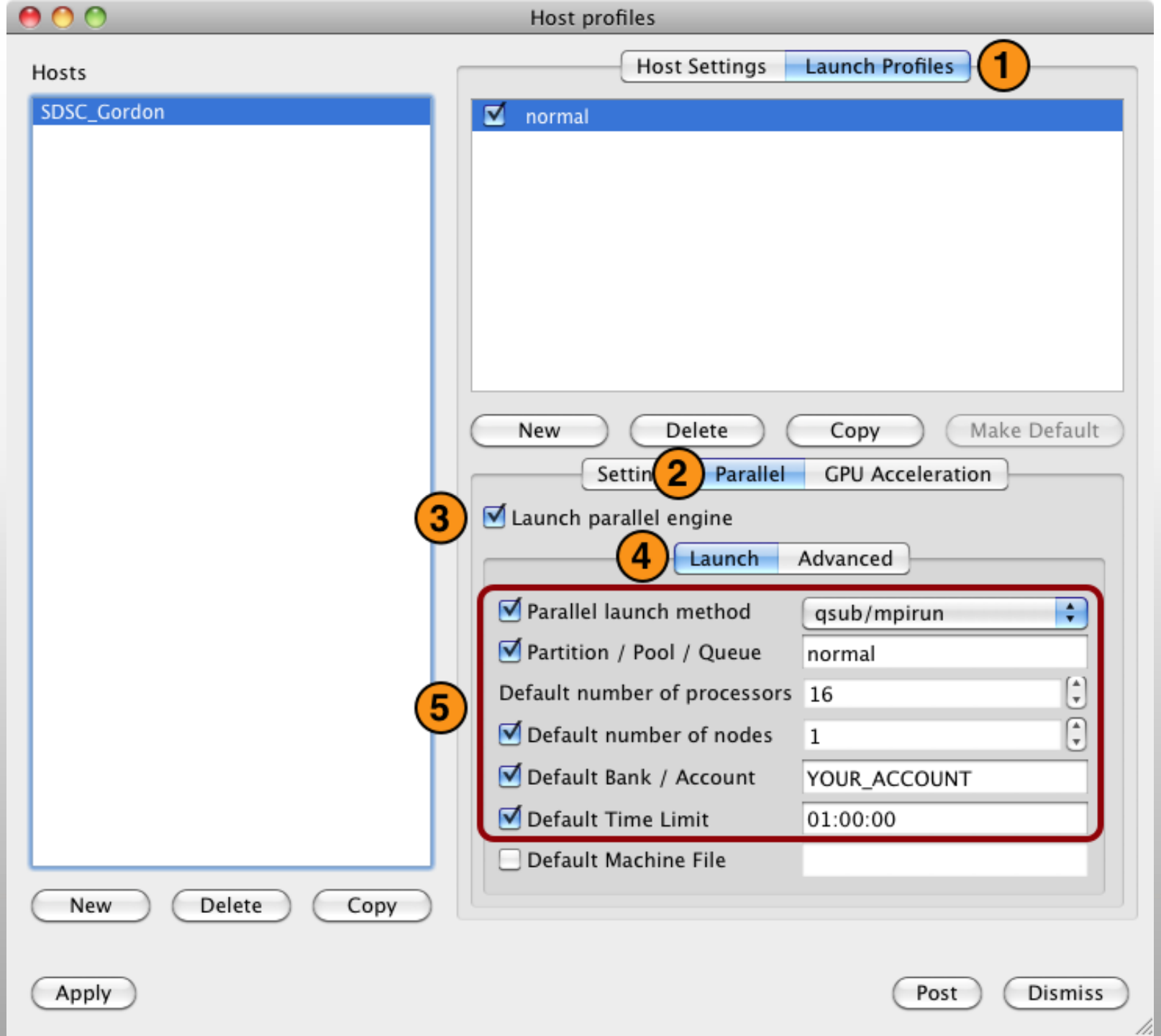
Documentation
http://www.sdsc.edu/us/resources/gordon/docs/gordon_visit.html

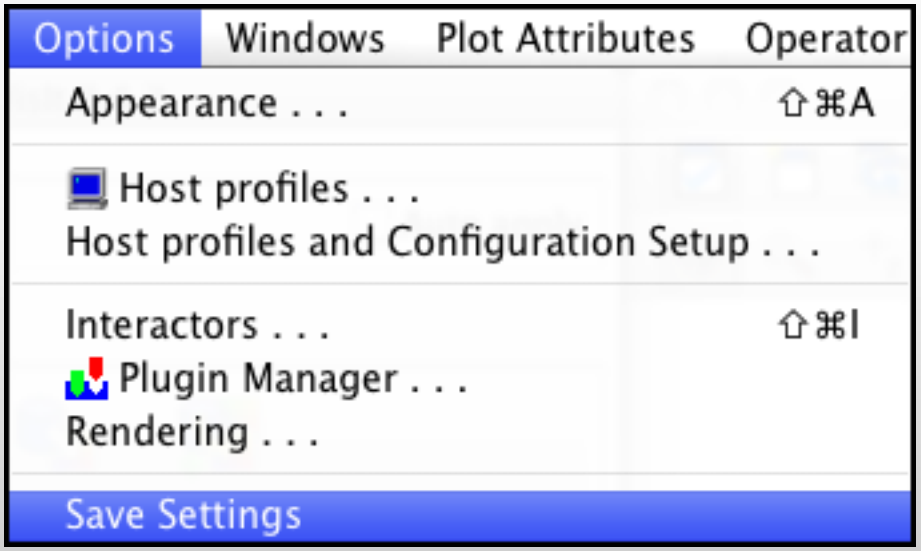
CREATE GORDON HOST PROFILE IN VISIT




Host profiles
Hosts
SDSC_Gordon
1
New
Delete
Copy
2
Host Settings
Launch Profiles
Machine
Host nickname
SDSC_Gordon
3
Remote host name
gordon.sdsc.edu
4
Host name aliases
Maximum nodes
1
Maximum processors
1
Path to VisIt installation
/opt/visit
5
Share batch job with Metadata Server
Account
Username
YOUR_SDSC_USER_NAME
6
Connection
7
Tunnel data connections through SSH
Method used to determine local host name when not tunneling:
Use local machine name
Parse from SSH_CLIENT environment variable
Specify manually:
Specify SSH port
22
Use gateway
Apply
Post
Dismiss


Host profiles
Hosts
SDSC_Gordon
New
Delete
Copy
Host Settings
Launch Profiles
1
normal
2
New
Delete
Copy
Make Default
3
Settings
Parallel
GPU Acceleration
Profile name
4
normal
Timeout (minutes)
480
Additional arguments
Apply
Post
Dismiss


Host profiles
Hosts
SDSC_Gordon
New
Delete
Copy
Host Settings
Launch Profiles
1
normal
New
Delete
Copy
Make Default
Settin
2
Parallel
GPU Acceleration
3
Launch parallel engine
4
Launch
Advanced
5
Parallel launch method
qsub/mpirun
Partition / Pool / Queue
normal
Default number of processors
16
Default number of nodes
1
Default Bank / Account
YOUR_ACCOUNT
Default Time Limit
01:00:00
Default Machine File
Apply
Post
Dismiss


Options
Windows
Plot Attributes
Operator
Appearance . . .
⇧⌘A
Host profiles . . .
Host profiles and Configuration Setup . . .
Interactors . . .
⇧⌘I
Plugin Manager . . .
Rendering . . .
Save Settings

USING VISIT IN COMMAND LINE OR BATCH MODE ON GORDON

Make sure that **Intel compiler** and **openmpi** modules are loaded

source /etc/profile.d/modules.sh

module purge

module load intel

module load openmpi_ib

module list

Continued Self Study

Complete the VisIt class and exercises provided here

http://visit.llnl.gov/manuals.html

More documentation

http://www.visitusers.org/index.php?title=User_Documentation

Sign up for VisIt users list. (Ask for help and help others)

https://elist.ornl.gov/mailman/listinfo/visit-users