

Broadening Participation in Visualization 2020

BUILDING DATA VISUALIZATION CAPACITY

Summer Webinar Series

July 21 - 24, 2020

UTSA The University of Texas
at San Antonio™

Byrd Data Visualization Laboratory

PURDUE
UNIVERSITY

Broadening Participation in Visualization 2020

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Administrivia & Logistics

- Take a moment to provide feedback for yesterday's session: Introduction to Data Visualization.
- Survey link located at the bottom of Day 1 Web page, can also be accessed from here <https://tinyurl.com/y2hsfb7x>



About Me

- Vetria Byrd, PhD
- Assistant Professor
- Purdue University
- Byrd Data Visualization Lab, Director
- Research Interests
 - Pedagogy of Data Visualization
 - HPC Visualization: visualizing heterogeneous data, and complex data in AR/VR environments
 - Utilizing data visualization to advance science in the area of symptom cluster management for healthcare
- Founder and Organizer of BPViz: Broadening Participation in Visualization Workshop

2020 | [2019](#) | [2018](#) | 2016 | 2014



Vetria Byrd
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Webinar Organizers



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Ritu Arora
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Brent League
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Webinar Goals and Objectives

Goal

Introduce participants to data visualization

Objectives

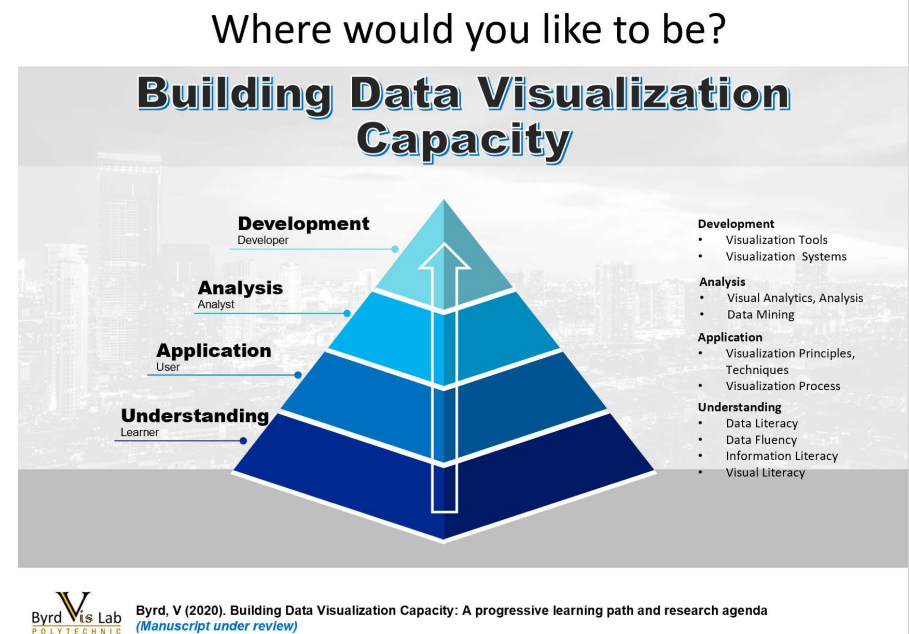
1. Examine what data looks like, define data visualization.
2. Illustrate how data visualization can improve understanding of the story within the data.
3. Introduce the data visualization process.
4. Explore different data visualization paths.

Brief Recap

Day 1: Introduction to Data Visualization

Recap From Day 1

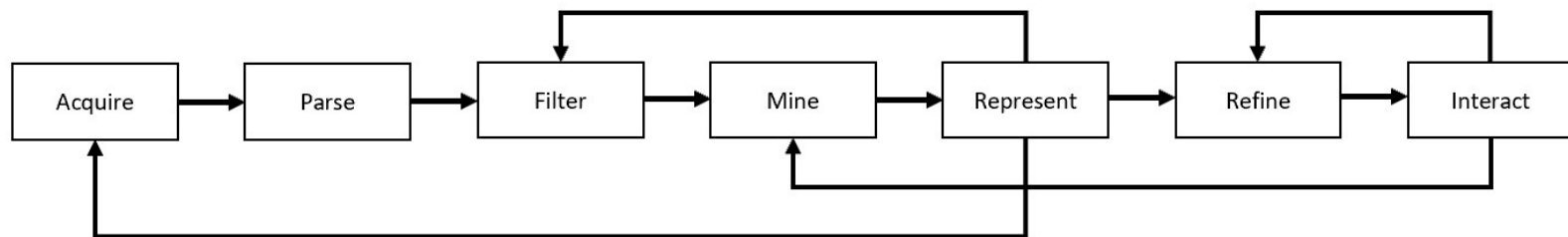
- Building Data Visualization Capacity
- Data Visualization Process
- The purpose of Visualization – Insight
- Advancing Beyond Data To Insight
- Hands-on Exercise



Recap From Day 1

- Building Data Visualization Capacity
- Data Visualization Process

7 stages of Visualizing Data



Fry, B. (2008). Chapter 1, Visualizing data (Safari Books Online). Sebastopol, Calif.: O'Reilly Media.

Recap From Day 1

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- Data Visualization Process
- The purpose of Visualization – Insight
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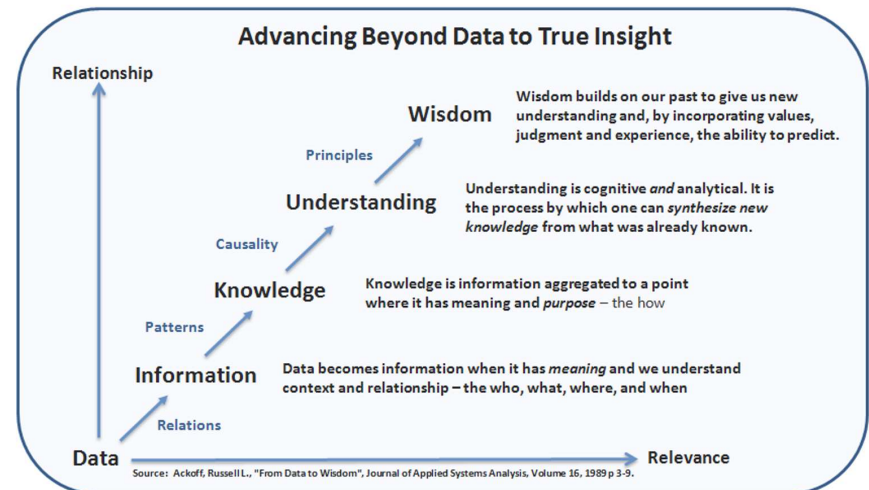


The next step in visualization

- Story Telling
- <https://www.edwardtufte.com/tufte/posters>

Recap From Day 1

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Recap From Day 1

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- Data Exploration and Analysis



Q: Does anyone want to share their insights? Any challenges encountered? We will share visualizations later.



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Webinar Website: <https://tinyurl.com/yctfhc6l>

Byrd **V**is Lab
POLYTECHNIC

We are here

Schedule	Topic	Skill Level
Day 0	Download and Install	Beginner
Day 1	Introduction to data visualization	Beginner
Day 2	You've got data now what?	Beginner/Intermediate
Day 3	Introduction to scientific Visualization	Intermediate/Advanced
Day 4	Visualization hackathon	Advanced

You've Got Data Now What?

Day 2: Information Visualization

Types of Data

Data can be divided into two distinct categories:

- Categorical (nominal and ordinal)
- Numerical (discrete and continuous)

Categorical data are values or observations that can be divided into groups or categories.

There are two types of categorical values: nominal and ordinal.

A nominal variable has no intrinsic order that is identified in its category.

An **ordinal variable** instead has a predetermined order.

<https://www.mymarketresearchmethods.com/types-of-data-nominal-ordinal-interval-ratio/>

Numerical data are values or observations that come from measurements.

There are two types of numerical values: discrete and continuous numbers.

Discrete values can be counted and are distinct and separated from each other.

Continuous values, on the other hand, are values produced by measurements or observations that assume any value within a defined range.

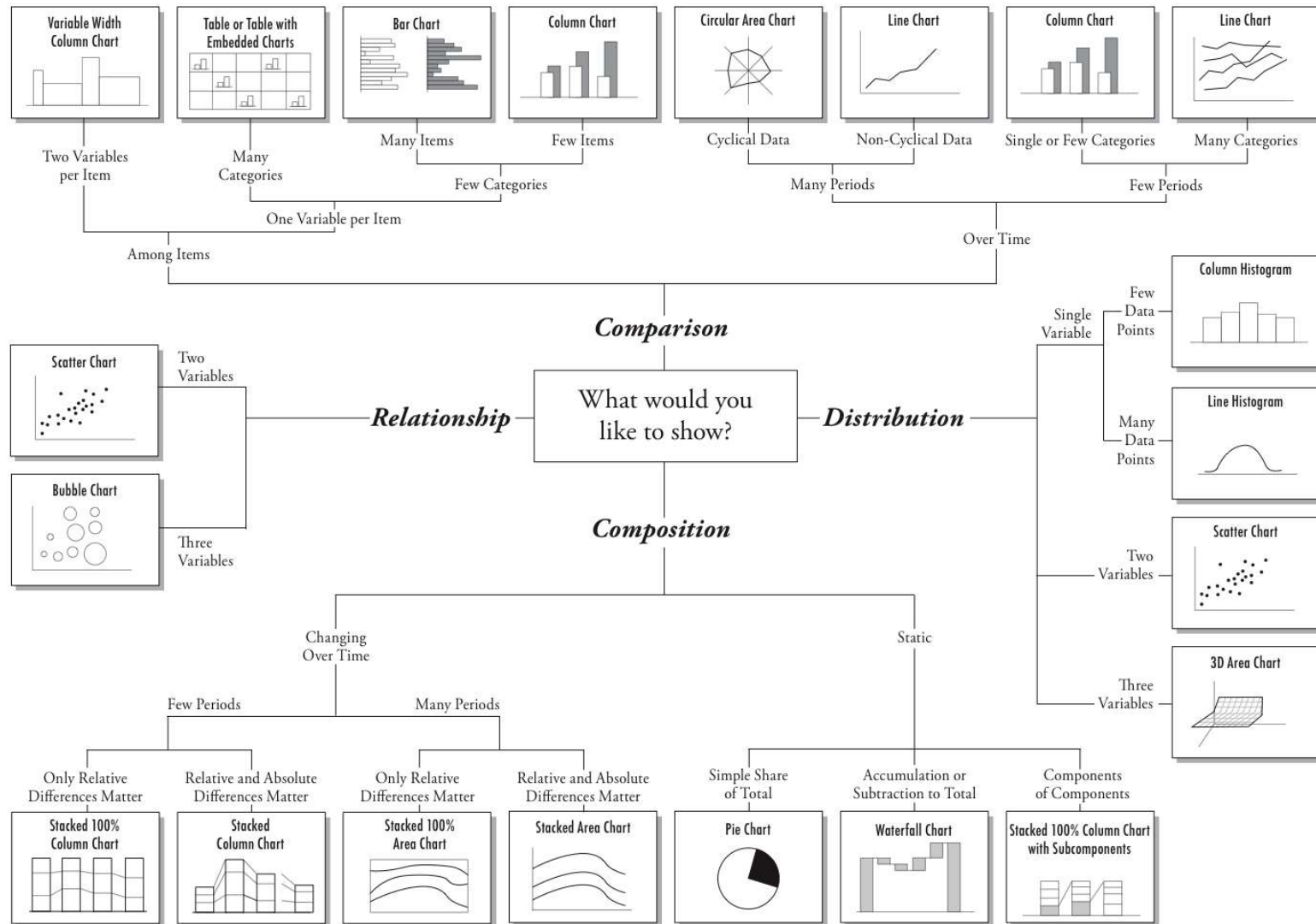
Understanding your Data

1. What real life behavior does the data reflect?
 - Does the data show patterns of activity, regularity of events, a timeline, population data, etc.,?
2. What are the strengths of the data source(s)?
 - Is the data source(s) a scholarly source, from a respected source?
 - What specific information is provided (summarized)? Is the data complete?
3. What are the weaknesses of the data source(s)?
 - Is the data complete? What is the quality of the data? Are there missing data? Is the data source specific to your needs for the current project? Is the data in the format you need?

Understanding your Data

4. What information is emphasized?
 - What is the central focus of the data?
5. At what level of granularity is the data provided?
 - Is the data summarized, or do you have access to the raw data?
 - Is the data categorized or is the data in a format that allows you to create your own categories, etc.,?
6. What is the scope of the data?
 - What topics can be covered using the data?
 - Is there a time range/frame?
 - Is the data for a specific area/discipline/demographic etc.,?

Chart Suggestions—A Thought-Starter





INFORMATION VISUALIZATION

YOU'VE GOT DATA, NOW WHAT?

Day: Wednesday, July 22, 2020

Time: 1PM - 3 PM (CST)/2PM - 4PM (EST)

Skill level: Beginner/Intermediate

A TOUR THROUGH THE VISUALIZATION ZOO

As discussed on Day 1, data dictates the type of tools used to gain insight. In this training we explore the abundance of visualization applications to fit different visualization needs, chart types, layouts, principles of data visualization.

- [Core Principles of Data Visualization](#)
- [Visualization Taxonomies](#)
- [Data Visualization Check List](#)
- [Data Visualization Catalog](#)
- [Data Visualization Reference Guides](#)

Heer, Jeffrey, Michael Bostock, and Vadim Ogievetsky. "[A Tour through the Visualization Zoo](#)." Communications of the ACM 53.6 (2010): 59-67. [[Paper](#)].

Data Exploration and Analysis

Hands-on Exercise
Revisited with Tableau



Data Exploration and Analysis Exercise in Tableau

- Locate your data file a1-cereals (csv or xls)
- Start Tableau

Data fields, types and roles

- https://help.tableau.com/current/pro/desktop/en-us/datafields_typesandroles.htm
- Using Tableau, and the cereal data file, create some visualizations to highlight any insight you have gleaned from the dataset.

What's next?

- This is just the tip of the iceberg for Information Visualization
- Additional resources are provided on the Webinar webpage.

Tomorrow – Day 3

- Topic: Introduction to Scientific Visualization
- Using ParaView