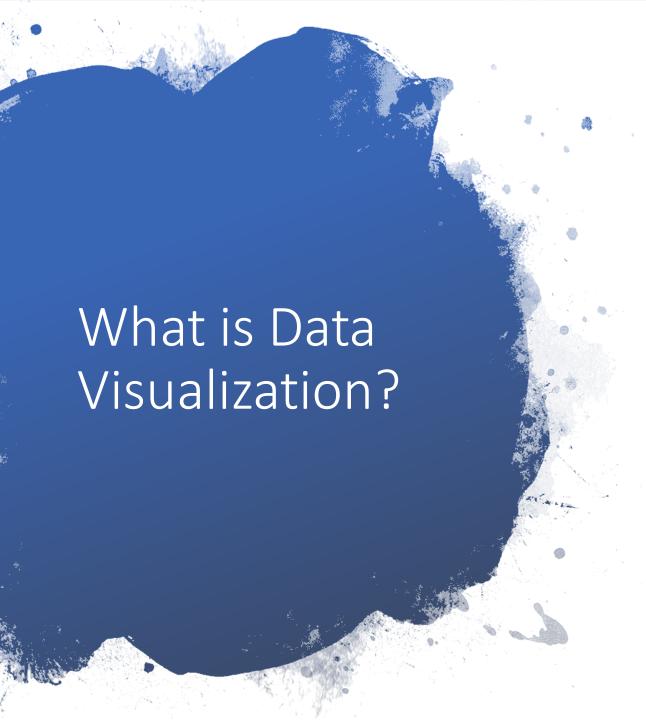
Data Visualization in a nutshell Presented by Wing Chan



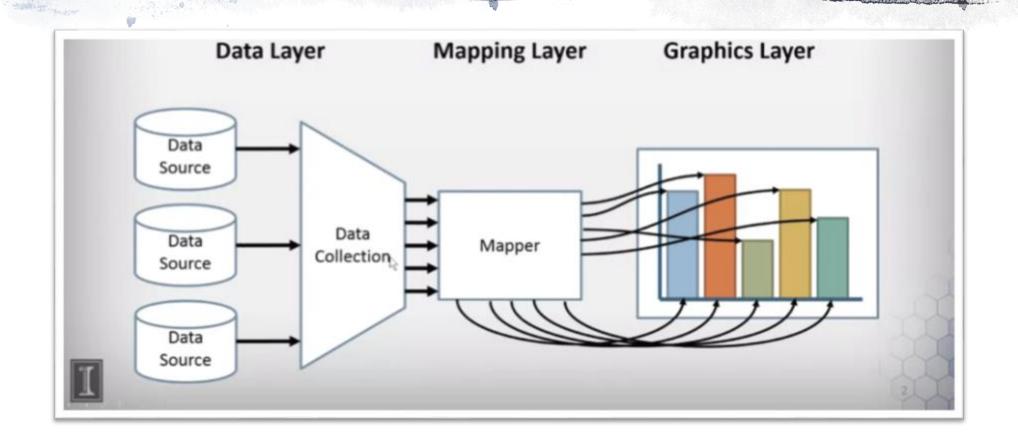
- What is Data Visualization?
- Data Visualization Framework
- 3 styles of Data Visualization
- Tools (Tableau vs D3.js)
- Demos



Data visualization is the graphical representation of information and data. By using visual elements like charts, graphs, and maps, data visualization tools provide an accessible way to see and understand trends, outliers, and patterns in data.

In the world of Big Data, data visualization tools and technologies are essential to analyze massive amounts of information and make data-driven decisions.

Data Visualization Framework





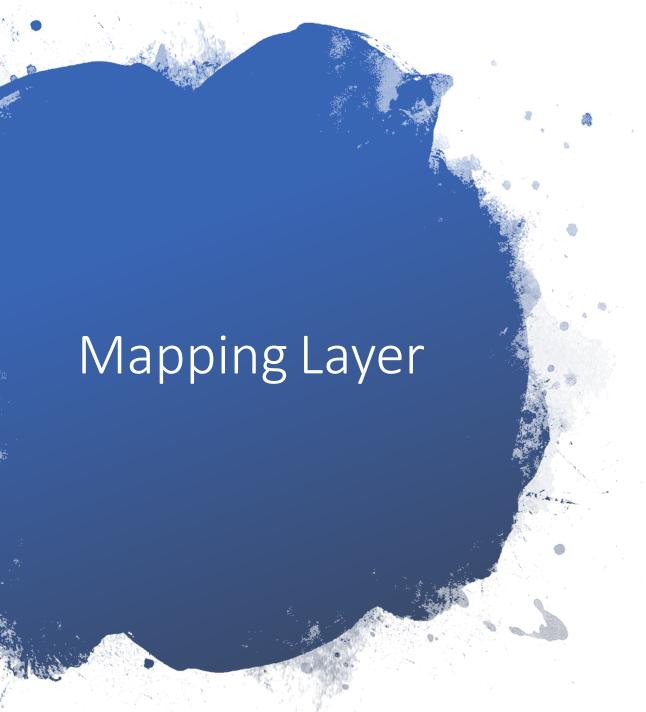
• Purposes:

- Locating and obtaining data
- Importing data in proper format
- Relating data for proper correspondence
- Data analysis and aggregation

Data Types

- Discrete vs Continuous
- Ordered vs Unordered

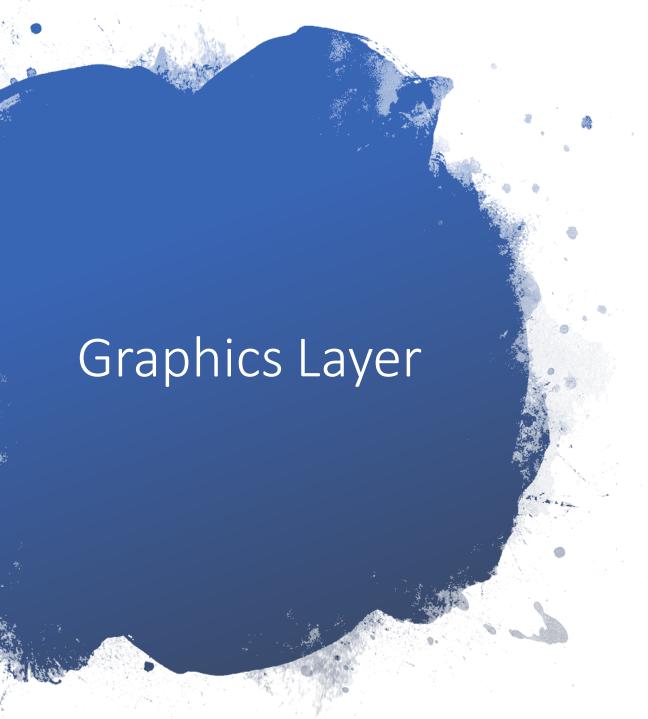
	Discrete (no between values)	Continuous (values between)
Ordered (values are comparable)	Ordinal, e.g. size: S,M,L,XL, Quantitative, e.g. counts: 1,2,3,	Fields, e.g. altitude, temperature
Unordered (values not comparable)	Nominal, e.g. shape: □○△ Categories, e.g. nationality	Cyclic values, e.g. directions, hues



Purposes

- Associating appropriate geometry with corresponding data channels
- Data analysis and algorithms
- Perceptual Accuracy

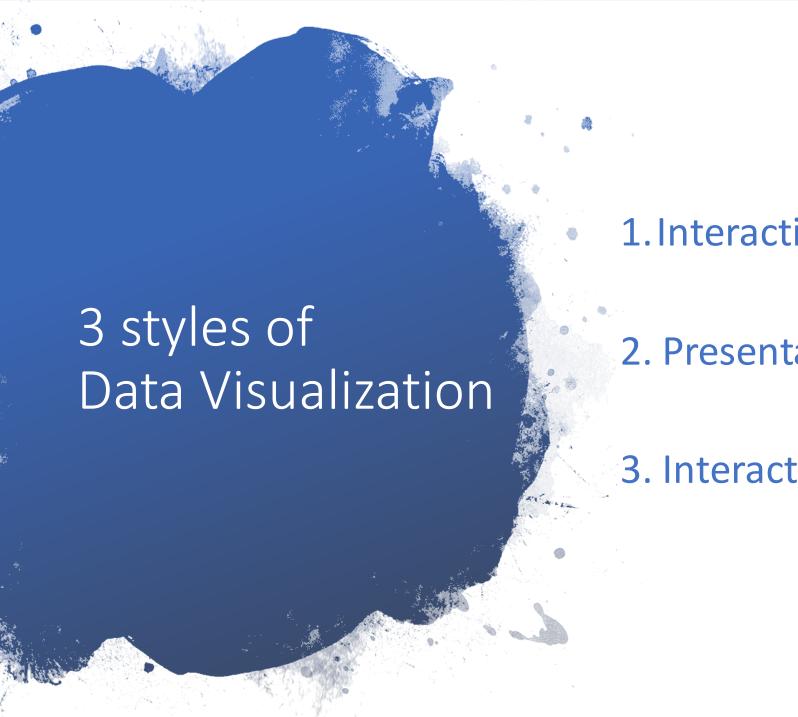
Quantitative	Ordinal	Nominal
Position	Position	Position
Length	Density	Hue
Angle	Saturation	Texture
Slope	Hue	Connection
Area	Texture	Containment
Volume	Connection	Density
Density	Containment	Saturation
Saturation	Length	Shape
Hue	Angle	Length
	Slope	Angle
	Area	Slope
	Volume	Area
		Volume



Purposes:

- Conversion of geometry into displayable image
- Decorations
- Managing interaction
- Common Charts
 - Bar Chart, Line Chart, Scatter Plots and Gantt Chart
- When to use?

		Independent	
		Nominal or Q. Discrete	Quantitative Continuous
Ind.	Nominal or Q. Discrete	Table	Gantt
	Quantitative Continuous	Gantt	Scatter
Dep.	Quantitative Discrete	Bar	Bar
	Quantitative Continuous	Bar	Line



1. Interactive Visualization

2. Presentation Visualization

3. Interactive Storytelling



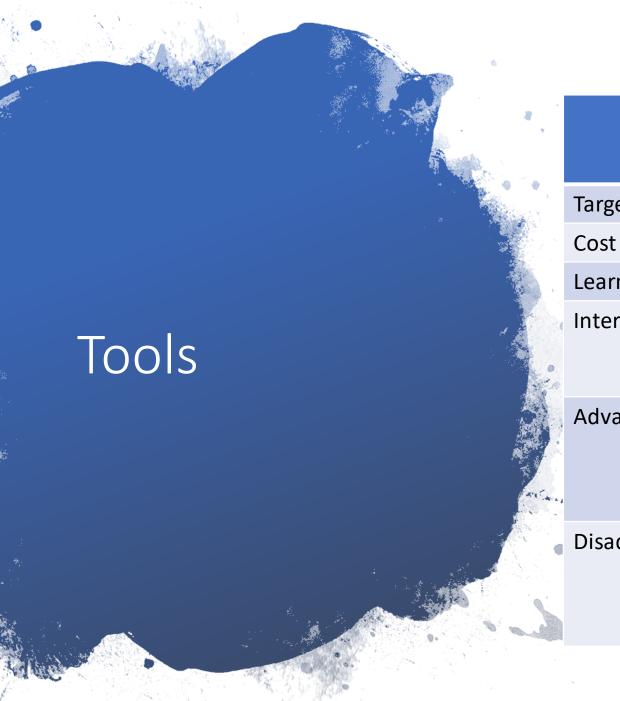
- Used for discovery
- Intended for a single investigator or collaborators
- Pre-renders based on input
- Prototype quality
- Example: Tableau public
- https://public.tableau.com/profile/wing.chan70
 63#!/vizhome/MoviesDashboard_15619067238
 430/Dashboard



- Used for communication
- Intended for large group or mass audience
- Does not support user input
- Highly polished
- Example: Electric cars sales
- https://cleantechnica.com/2019/05/24/visualiz ation-2012-2019-us-electric-car-sales-this-is-amust-see/



- Presentations via interactive webpages
- Narrative, using data to tell a story
- Invites viewers to explore further
- A medium for data journalism
- Example: The Economist: Big Mac Index
- https://www.economist.com/comment/26026
 07



Tool	Tableau	D3.js
Target User	Business Analysts	Developers
Cost	Expensive	Free
Learning curve	Low	High
Interface	Desktop app or Web portal	JavaScript library – load data and generate SVG or Canvas graphics
Advantage	 Great for data exploration Short development time	Integrate better on websitesHighly customizable
Disadvantage	ExpensiveNot easy to integrate with websites	Long development timeRequire web development skill



 Data: Titanic Survival dataset from Kaggle

https://www.kaggle.com/c/titanic/data

Demo #1: using Tableau

https://public.tableau.com/profile/wing.chan7063#!/viz home/TitanticDashboard/Dashboard

Demo #2: using D3.js

https://wingchanatibsa.github.io/cs498dv/index.html

