**DATA VISUALIZATION THEORY**

**Data visualization means encoding information gotten from data in a way that allows the reader to understand quickly and accurately.**

**Aside Visualizing data using graphical charts or graphs, efficient story telling is an important tool for every data scientist, symbols or charts used in data visualization should have a theory i.e. tell a story, this is the best way of visualizing data.**

**Visualization is all about visuals**

* **Retina Visuals: These encodings are easily picked by our retina in a chart, it involves the use of shape, color, size, orientation and shade, one or two of these is ok in visualization.** [**https://miro.medium.com/max/1400/1\*cBZT\_hlNNLTxKp4oQx7Olw.png**](https://miro.medium.com/max/1400/1*cBZT_hlNNLTxKp4oQx7Olw.png)
* **Spatial Encoding: “spatial” encodings exploit the cortex’s spatial awareness to encode information. this encoding can be achieved through position in a scale, length, area or volume. https://miro.medium.com/max/1400/1\*Rtw-IM4lvus43dI7nVRLCQ.png**

**Color works well for discrete variables e.g. gender race but not volumes, the best way to encode data depends on what you are trying to achieve, visualization results can be achieved using different charts, out of all visualization results charts, scaled bar chart is the one with least errors while stacked bar charts are a bit harder to compare and errors are greater, also bar charts have on average half the error of pie charts**

**Gestalt Theory**

**The gestalt principles (German for shape) were developed by 20th-century psychologists to understand patterns in human visual perception**

**Similarity**

**Gestalt similarity highlights the brain’s ability to categorize things into groups. Similarity can happen due to any visual encoding like position, shape, color, size, etc.**

**Tufte’s Information to Ink Ratio**

**Edward Tufte is an American statistician and a pioneer in data visualization. Some of Tufte’s principles are very controversial. Tufte has a very radical view of what makes a visualization good.**

**Tufte strictly believes in data in ratio, and all the ink that is not necessary to visualize the data should be avoided entirely. In the figure above I have obviously exaggerated things a bit, but you get the point. The figure on the left has lots of clutter and it distracts the reader from what we really want to see.**