Many visualization softwares enable you to spruce up your plots by turning the plots graphical elements into three-dimensional objects. 3D plot visualization can be helpful or misleading it is totally depending on the usage. Following are the example of misleading 3D plot and 3D plot helps better than 2D plot.

Example of 2D plot better than 3D Plot –

A picture containing diagram

Description automatically generated

Mortality rates in Virginia in 1940, visualized as a 3D bar plot. Mortality rates are shown for four groups of people (urban and rural females and males) and five age categories (50–54, 55–59, 60–64, 65–69, 70–74), and they are reported in units of deaths per 1000 persons. This plot is misleading because the 3D perspective makes the plot difficult to read.

In general, it is better to use Trellis plots instead of 3D visualizations. The Virginia mortality dataset requires only four panels when shown as Trellis plot. I consider this figure clear and easy to interpret. It is immediately obvious that mortality rates were higher among men than among women, and that urban males seem to have had higher mortality rates than rural males whereas no such trend is apparent for urban and rural females.

Chart, bar chart

Description automatically generated

Data source: Molyneaux, L., S. K. Gilliam, and L. C. Florant. 1947. “Differences in Virginia Death Rates by Color, Sex, Age, and Rural or Urban Residence.” American Sociological Review 12: 525–35.

Example of 3D plot better than 2D plot-

Shape

Description automatically generated

This 3D plot is the patterns of evolutionary variation in a protein. The colored tube represents the backbone of the protein Exonuclease III from the bacterium Escherichia coli (Protein Data Bank identifier: 1AKO). The coloring indicates the evolutionary conservation of the individual sites in this protein, with dark coloring indicating conserved amino acids and light coloring indicating variable amino acids.

From this 3D plot we can say that it is difficult to present the same information with 2D plot.

Data Source: Marcos, M. L., and J. Echave. 2015. “Too Packed to Change: Side-Chain Packing and Site-Specific Substitution Rates in Protein Evolution.” PeerJ 3: e911.