# Digital Humanities at the intersection of three approaches to data visualisation: statistical graphics, data humanism, and humanistic interpretation.

*Author: Aida Horaniet Ibañez*
*Affiliation: Centre for Contemporary and Digital History, University of Luxembourg*

Digital humanities play a key role in the progress of the data visualisation field. First, as humanities scholars, they engage with the concept of knowledge as interpretation. Second, they leverage computational tools and statistical methods for the analysis and visualisation of data and metadata. And finally, digital humanities projects are a space for experimentation where different epistemic cultures negotiate new forms of knowledge (Fickers and Tatarinov 2022).

This article presents a classification of current approaches to data visualisation into (I) *statistical graphics*, (II) *data humanism* and (III) *humanistic interpretation*; based on four main aspects: a) the intellectual habits around the definition of data, b) the characteristics of the data visualisation and its objectives, c) the relation between the data and the data visualisation, and d) the expected user interaction. The classification aims to help navigate the visualisation continuum between quantitative and interpretative practices and to identify opportunities for future development.

The intellectual habits around the definition of data are the first element of differentiation among approaches: *given* or *taken*[1], with an increasing level of engagement with the data construction process, from the lowest in *statistical graphics* to the highest in *humanistic interpretation*.

*Statistical graphics* aim at simplifying complex topics to support quick decision-making. *Data humanism*[2] promotes slowness to engage the user in the exploration of visual narratives. In *humanistic interpretation*, the goal is the interpretative process itself, directly constructing arguments through visual means.

*Statistical graphics* are characterized by their abstraction, standardisation, and legibility. Using predefined charts and standard practices facilitates the effective processing of the content[3]. *Data humanism* leverages granularity, full coverage and situatedness. Using visual vocabularies tailored to the project opens new opportunities to explore the data[4]. *In humanistic interpretation*, the visualisations are characterised by the use of non-standard visual elements such as non-discrete categories, unequal scale divisions, or metrics as a factor of a point of view (Drucker 2017).

While the relation between data and visualisation in *statistical graphics* and *data humanism* is unidirectional – data precedes the visualisation, *humanistic interpretation* introduces a non-representational approach, in which graphical input might be used as the primary means of interpretative work (Drucker 2017), which could later be translated into data.

In *statistical graphics*, the user is expected to know how to read a graph and ask predefined questions to generate formatted answers. In *data humanism*, the design stimulates the user's interest, taking ample time to explore non-linear stories and multiple narratives. Educating the user on how to read the visualisation is part of the process. In *humanistic interpretation*, the user interacts with the visualisation to build knowledge through a series of interactions in which the user can mark and annotate the data and the visualization using graphical elements of interpretation.

Numerous tools[5] support data visualization. However, it is difficult to find a solution that covers the three approaches. The wide range of possibilities associated with *data humanism* and *humanistic interpretation* makes it more challenging to develop standard tools and methods. However, after studying more than 500 data visualisations[6], several frequent standardizable characteristics have been identified, including the use of multivariate data glyphs and custom visual vocabularies, the emphasis on individual data points within the overall distribution; as well as the use of custom layouts, variations of statistical graphs, duplicated visual encodings, embellishment, and interpretation elements.

Although many disciplines contribute to the field of data visualization, the digital humanities are well positioned along the visualization continuum to develop and integrate the three approaches.

## Notes

[1] Based on Drucker's concept of data as *capta* being taken actively instead of given (Drucker 2011). I refer to intellectual habits, and not to the definition of data itself, because all data is taken (as opposed to found or given).
[2] Based on Lupi's concept of Data Humanism (Lupi 2017).
[3] The literature about visualisation of statistical graphics is extensive including the work of (Tufte 1999; Bederson and Shneiderman 2003; Ware 2004; Munzner 2009; Few 2012; Kirk 2014; Cairo 2016; Schwabish 2021), among many others.
[4] Some examples of custom visual vocabularies include the work of Sonja Kuijpers on "A View of Despair" (http://www.studioterp.nl/a-view-on-despair-a-datavisualization-project-by-studio-terp/) and "Bruises – The Data We Don't See" by Giorgia Lupi (http://giorgialupi.com/bruises-the-data-we-dont-see).
[5] Including data visualization tools (e.g., Excel, Google Sheets, Tableau, Power BI, RAWGraphs, Flourish, Matlab); programming libraries like ggplot2 (R), matplotlib and seaborn (Python), or d3 (JavaScript); design software like Adobe Illustrator, or tools that integrate data visualisation for specific purposes (e.g., Voyant for text analysis, Gephi for network analysis).
[6] It is important to note that the collection studied includes mostly data humanism visualisations, since the visualisations applying humanistic interpretation are very few, and the variability in the statistical graphs is limited and has already been largely studied. The sources of the studied data visualizations include digital and print media across a variety of fields.

## Bibliography

Bederson, Benjamin B, and Ben Shneiderman. 2003. *The Craft of Information Visualization: Readings and Reflections*. Amsterdam; London: Morgan Kaufmann.
Cairo, Alberto. 2016. *The Truthful Art: Data, Charts, and Maps for Communication*. Place of publication not identified: New Riders.
Drucker, Johanna. 2011. "Humanities Approaches to Graphical Display." *DHQ* 5 (1).
———. 2017. "Non-Representational Approaches to Modelling Interpretation in a Graphical Environment." *Digital Scholarship in the Humanities* 33(2) (July). https://doi.org/10.1093/llc/fqx034.

Few, Stephen. 2012. *Show Me the Numbers: Designing Tables and Graphs to Enlighten*. 2. ed. Burlingame, Calif: Analytics Press.

Fickers, Andreas, and Juliane Tatarinov, eds. 2022. *Digital History and Hermeneutics: Between Theory and Practice*. De Gruyter. https://doi.org/10.1515/9783110723991.

Kirk, Andy. 2014. *Data Visualization: A Successful Design Process*.

Lupi, Giorgia. 2017. "Data Humanism: The Revolutionary Future of Data Visualization." *PrintMag*, 2017. https://www.printmag.com/article/data-humanism-future-of-data-visualization/.

Munzner, Tamara. 2009. "A Nested Model for Visualization Design and Validation." *IEEE Transactions on Visualization and Computer Graphics* 15 (6): 921–28. https://doi.org/10.1109/TVCG.2009.111.

Schwabish, Jonathan A. 2021. *Better Data Visualizations: A Guide for Scholars, Researchers, and Wonks*. New York: Columbia University Press.

Tufte, Edward R. 1999. *The Visual Display of Quantitative Information*. 17. print. Cheshire, Conn: Graphics Press.

Ware, Colin. 2004. *Information Visualization: Perception for Design*. The Morgan Kaufmann Series in Interactive Technologies. San Francisco, CA: Morgan Kaufman.