

Image-based information visualization (or how to unify SciVis and InfoVis)

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ABSTRACT

For decades, scientific visualization (SciVis) and information visualization (InfoVis) have been related, but still distinctly separated disciplines. Methods and techniques in the two areas have developed relatively separately, causing an arguably unnecessarily separation in the visualization field. Attempts for unification exist, but are largely based on heuristics, and subject to critique from both the SciVis and InfoVis angles. In this talk, we argue that this separation is not necessary, and, up to large extents, artificial. More specifically, we argue that the difference between SciVis and InfoVis is not a matter of design decisions only, but, more centrally, a matter of representing the structure of large data collections by means of smooth, continuous, encodings. We present a way to cast InfoVis along the same principles as the more classical SciVis, based on a continuous, multiscale, spatial representation of data. Putting it simply, we argue that visualizing large amounts of InfoVis data can use encoding techniques which share the same continuity and multiscale principles as most classical spatial SciVis (or image processing) methods use. In turn, we show how this is possible by means of defining appropriate similarity metrics and encoding principles for InfoVis data. This leverages a wealth of data simplification, encoding, and perception principles, since long available for SciVis data, for the richer realm of InfoVis data. We demonstrate our image-based paradigm by examples covering the visualization of relational, multidimensional, and time-dependent InfoVis.

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