

# Human Activity

## From the Renaissance to the 21st Century

In art history and archeology, as in any other branches of humanities, the increasing availability of massive amounts of quantitative data is fundamentally changing our perspective and research. Understanding impressive amounts of data – including bibliographies, inventory and research databases, Flickr images of historic sites, scanned books, click-streams of literature downloads, and other linked data is just as transformative for humanities, as the ideas of quantum mechanics were for physics in the beginning of the twentieth century.

In our hunt for general patterns and laws that characterize complex systems we find overarching themes, such as the one illustrated in figure 1, showing the reception of ancient Roman monuments in Western Renaissance documents (left), placed next to the the very same monuments as they appear in modern scholarly literature (right). The overall similarity between these two maps is obvious and rather amazing.

Both show that most documents (represented as brown nodes) depict or mention only a small number of monuments (given in blue), whereas a few documents point to a disproportionately large number of monuments, representing reviews or large catalogues. That is the reference patterns of art historians appear to follow the same hub dominated scale-free topology as the one characterizing the www, scientific citations, or the human cell. Another common feature is the fact that most nodes of the network are reachable from every other node with a very few hops. Obviously, these maps are driven by the interests, judgements and actions of each author who placed themselves on the map by referring to a shared core set of monuments, which allows for communication with peers, without a central control.



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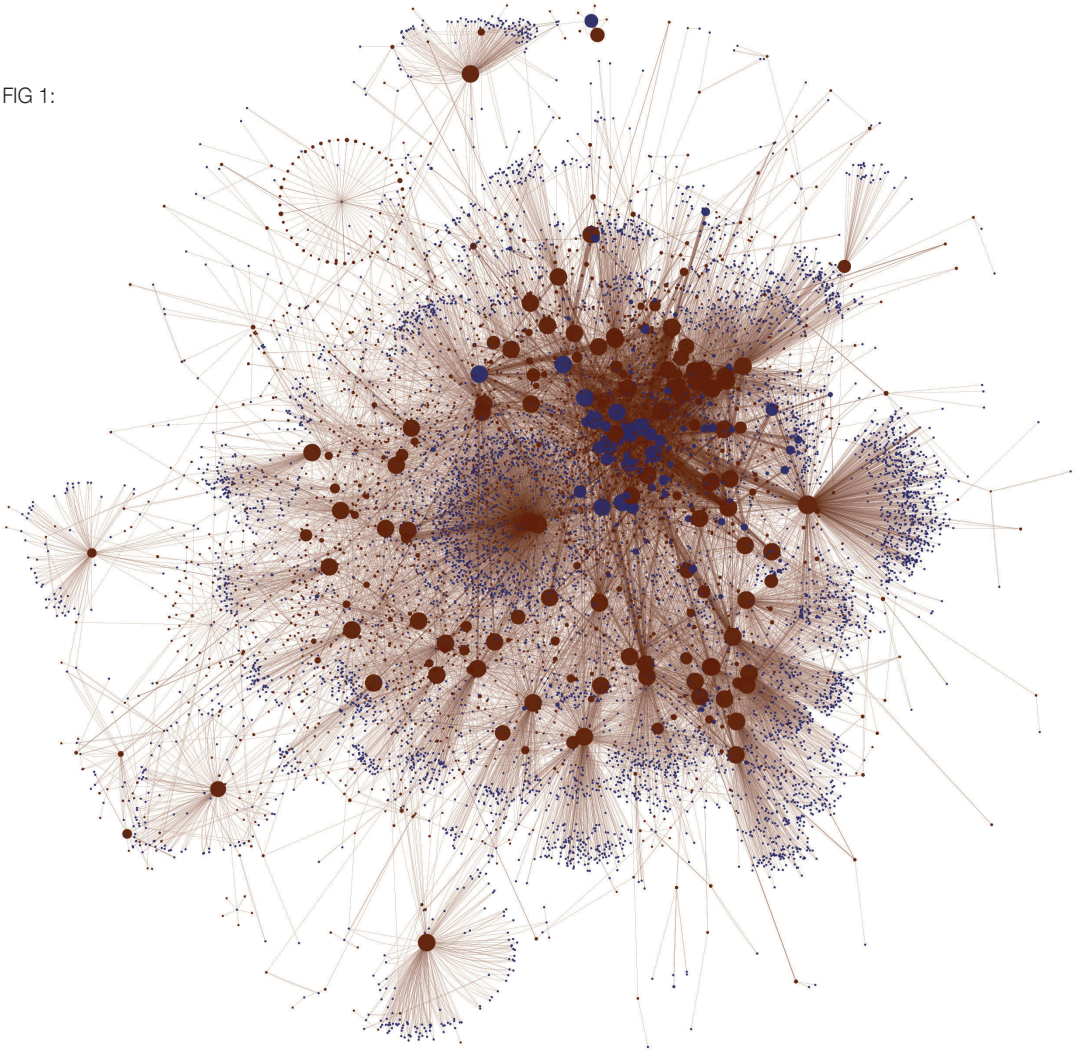
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The equivalence of both maps is important, as it proves that old documents, which we consider subjects of our own study, behave just like the ones we produce today; in other words that the pattern of renaissance scholarship is very similar to our own present day effort in art history and archaeology. This has a number of consequences: First it allows us to simplify the way how we process and interpret data, as there is no need to view renaissance and modern scholarship as being fundamentally different. Second it fortifies the opinion that archaeology was not born thanks to the definitions of a single person in the 18th century, but emerged from the local and distributed activity of a large number of stakeholders. And finally it means that both our very own scholarly activity and the activity of our renaissance predecessors can be analyzed with the same tools.

Today we can produce maps such as those shown in the figure with incredible ease, offering a big picture that preserves the original source in its initial granularity, without being affected by filtering based on preconceived concepts or simplistic dissections of art history into stereotypic periods. Along these lines data driven research in the humanities, the social sciences and many other fields offers new insights every day, transforming our understanding of culture and society. As humanities, physics, biology and computer science join hands in subscribing to this new data driven approach, we are moving beyond the reductionist approaches of the past, providing a new understanding of the complexity of the world around us.

FIG 1:



**FIG 1:** Reception of ancient monuments in western renaissance documents (left) and modern scholarly literature (right). Monuments are depicted as blue nodes; documents and literature are represented in brown. The node size indicates the number of subdivisions per nodes:

documents range from single drawings to multivolume books; monuments include mostly sculptures and a few large buildings. The similarity of both maps shows that the perspectives of renaissance scholarship and modern art history and archaeology are equivalent.

