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## "Data-Driven Aesthetics"

Mark Hansen, June 19, 2013

Looking out from a small control room, I scan the suspended grid of more than 200 iPhone-size computer screens for any sign of life. One flickers awake, flips through a sequence of messages, too fast to be legible, and then holds on the sentence "I'm really not meant for him." After a short pause, a screen three columns over lights up, runs through more messages and finds "I'm scared I'll lose my smile ..."

The grid is "Listening Post," a decade-old artwork by Ben Rubin and me that tries to portray the conversations happening across the Web. It will be shown as part of an exhibition opening Saturday at La Panacée, a new contemporary art center in Montpellier, France.

Ten years ago, I was a statistician at Bell Laboratories. The idea that data might be the basis for creative work in the arts was new to me. But since then, I have collaborated with artists like Mr. Rubin, designers, even an experimental theater company.

From a speedometer to a weather map to a stock chart, we routinely interpret and act on data displayed visually. With a few exceptions, data has no natural "look," no natural "visualization," and choices have to be made about how it should be displayed. Each choice can reveal certain kinds of patterns in the data while hiding others.

While these decisions are often made on technical grounds, they are also questions of design. As Paola Antonelli, senior curator of architecture and design at the Museum of Modern Art, put it, "Design and data look at each other as companions."

Ms. Antonelli points to a recent visualization by Giorgia Lupi depicting the "Brain Drain" in science. Ms. Lupi asks, "What makes a researcher leave their home for another country?" Her image is made up of compound, geometric shapes that represent different countries arranged to depict the relationship between researchers per million people in a country, and the percentage of its G.D.P. devoted to scientific research and development. The shapes themselves vary according to characteristics of each country's educational system and the balance of scientists entering and leaving the country. Ms. Lupi's visual borrows heavily from Mondrian and the language of abstract art.

Artists working in data can also help to highlight the ambiguity or uncertainty intrinsic in a data set. Take the mysteries of biological life, for example. A recent art commission, "Signals," is a 48-foot by 11-foot mural at the Koch Institute for Integrative Cancer Research at the Massachusetts Institute of Technology.

The assignment given to Casey Reas, a professor at the University of California, Los Angeles, and Ben Fry, a principal at Fathom, an information design consultancy, was to create a visualization of how proteins communicate within a cell, and how this signaling changes for cancer cells. As art, however, their goal was to give a qualitative feel of the nature of the data. Mr. Reas and Mr. Fry worked closely with scientists on the project, and they used vast amounts of biological data. But, Mr. Reas said, "We were actually obscuring it in order to get closer to the feel of it."

Today, artists are working effectively with data at larger and larger scales. For example, Aaron Koblin, creative director at the Data Arts Team at Google, has designed a number of "classic" data visualizations involving large, complex data sets. These range from Web animations of airplane traffic over the continental United States to real-time representations of telephone and Internet traffic carried by AT&T into and out of New York City.

Crowdsourcing can be a data source. Mr. Koblin was a creative director on "The Johnny Cash Project," a work inviting participants to contribute separate, hand-drawn frames of the music video to Cash's "Ain't No Grave." My latest collaboration with Mr. Rubin is again a piece that deals in snippets of text. Together with Jer Thorp, a data artist from Vancouver, we have created "Shakespeare Machine." It is a kind of data chandelier that hangs over the bar in the Public Theater in New York City. Each of its 37 blades displays text from one of the plays of Shakespeare.

In this project, we benefit from the digital humanities, and specifically the MONK project, or Metadata Offer New Knowledge, which adds extra information to each word of Shakespeare's plays.

In a kind of "anaphora mining," we combine the words, their parts of speech and something of their semantic content to identify common rhetorical structures. And so "the slings and arrows" in Hamlet matches "the prophets and apostles" in Henry VI and "the spies and speculations" in King Lear. Groups of phrases like these stream across the installation's blades.

The visual presentation of quantitative information is an old practice. Artists and designers now work throughout the systems that collect, store and process data. They are even making their own tools, both hardware and software.

And there are feedback loops — "Shakespeare Machine" is possible because the tools and techniques behind new forms of measurement for use in the arts are also producing new forms of data from the arts.