Pinpoint demo: An interactive visualization to help find people in a large organization. I am in the center, people around me known and unknown, distance based on similarity of interest and competence. People on the floor can be explored, a new person centered, tags serve as filters.

When designing the Pinpoint interface, our aim was for the user to experience the interaction as
- responsive and malleable (pliability)
- powerful grasp of the scope from overview to detail.

Pliability and the other one are examples of experiential qualities: attempts to articulate key elements of the user's experience of using an interactive product or service.
Six years ago, I collected a number of such qualities from my own experience and from the design literature and sorted them into a map. Since then, I have looked further into some of them. I tend to believe that experiential qualities are connected with different genres. For instance, the quality of an interactive visualization from the user’s point of view is strongly dependent on its pliability. How tightly input and output are coupled; how responsive the interface is; how much using it feels like shaping a malleable material with your hands.

The way I find most fruitful in elaborating and communicating an experiential quality is by combining a few words with a lot of examples, showing what is pliable and less pliable, and what determines pliability. I guess you heard about Gapminder yesterday. Interesting to see how a more pliable interface to already existing data made it so much easier for Hans Rosling to get his message across.

A similar – and quite old – example is the Visual Thesaurus which draws on exactly the same data as a regular online thesaurus but thanks to the more pliable interaction engenders a quite different (and more accurate) view of language as a transient social construction.
The notion of pliability originates with the work by Christopher Ahlberg and Ben Shneiderman in the early 90s on dynamic queries, which they analyzed in terms of »tight coupling«. They also showed experimentally that a more pliable interface increases chances for serendipitous discovery.

Filmfinder was based on the Internet Movie Database; a recent example using the same data is Liquid Browsing by Christian Waldeck. The choice of IMDB data is probably a homage to the Filmfinder, even though I haven't been able to confirm that. Pliability is taken further here by going to semi-tactile or quasi-tactile interaction using a stylus.

And the quasi-tactile direction is taken even further in work such as BumpTop where much effort has been spent on the simulated physics and the gestural idioms. Not as much effort on elementary principles, unfortunately: How could you tell different PDF files apart when they all look like PDF logos?
»Shaping a malleable material with your hands« brings us to multitouch interaction, of course. Popularized by Jeff Han only two years ago (!), now a must-have in handheld devices and a somewhat over-hyped option for table and wall displays.

One of Han’s original MTI demos was an online map, which is also a useful case to think about pliability. Here are four different examples of inline maps from early 2006. Eniro (top left), like most other yellow-pages map services at the time, used a coarse-grained navigation scheme: click red frame to pan. Google Maps (then Google Local, top right) came along with direct-manipulation pan. In Google Earth (bottom left), the zoom was also direct. And Han’s MTI demo (bottom right) emulated Google Earth functionality with the fingers literally in the data.

Pliability may also cut across modalities, as in the well-known Reactable collaborative musical instrument…
...or in Loops (which I think is available in the demo session right after this). Here, we are talking about not only eyes and hands but rather eyes, ears and hands.

g-speak is a recent demonstrator from an MIT spinoff company. One of the founders was scientific advisor (or inspirator) for Minority Report, as you can tell. It prompts us to ask further questions related to pliability. What does the physical distance between hand and material mean, compared with a touch display? Can the friction of finger or stylus on display surface compensate to some extent for lack of physical feedback, and does that make g-speak seem less pliable? The need for a Pause gesture, as opposed to simply releasing the surface?

So far, mostly medium-sized datasets and GUI desktops. But pliability may be even more important for large, unstructured datasets where conventional search is not really an option. Photosynth from Microsoft Research illustrates two steps towards more pliable image banks. First, multiresolution images for extreme zooming and focus+context navigation. Secondly, algorithms to analyze large volumes of images and relate them spatially to each other. Resulting experience is exploring a space rather than browsing a list of jpeg files.
Pliability makes the user’s experience with an interactive visualization more pleasant and engaging on the surface. But we can never separate interface from contents. An interactive visualization is always ultimately about something. In order for sustainable engagement, the visualization needs to be meaningful to the user. If not, it is merely a diversion (»eye and finger candy«).

The success of the 2006 project We Feel Fine by Jonathan Harris is a good illustration of the importance of meaning.

To wrap up where we started: We created a number of personalized Pinpoint versions and tested them with knowledge workers. We found that the concept was desirable (»When can I have it?«). We also found it to be useful (»efficiently finding right people; sense of shared belonging; identify improvement potentials«). We attribute these results largely to pliability and meaningfulness (and there is, of course, also a novelty factor in play). Specific design features for pliability: tight feedback, incremental filter operation, animations for cognitive coherence. Data and services meaningful in relation to work context (initial field study).
What we failed to create, however, was the distinct sense of grasping the scope from overview to detail. In fact, the conceptual model of 60-from-many was not clear to all our participants. The design would need to be revised, to suggest the size of the full database. (And to make it more clear that the tags are tags.)

In conclusion, I would argue that pliability and meaningfulness contribute to making an interactive visualization good to use. The intention of basing this presentation entirely on examples is to provide starting points for you as designers of interactive visualizations, to help you extend your repertoires for upcoming design projects.

Sources for further study: