PHOTO: NY TIMES NEWS SERVICE

# Both eyes on the future

*Martin Wattenberg creates his own ways of seeing information through data visualization*

BY **BILLY BAKER**
NY TIMES NEWS SERVICE, BOSTON

## Martin Wattenberg

**Hometown:** Amherst, Massachusetts; lives in Winchester, Massachusetts

**Education:** Bachelor's degree in math from Brown, 1991; master's in math from Stanford, 1992; PhD from University of California, Berkeley, 1996

**Family:** Wife, Laura Wattenberg, is a writer. They have two daughters: Eve, 8, and Nina, 7

**Hobbies:** Collecting old board games

SOURCE: NY TIMES NEWS SERVICE

**As** the setting to begin explaining what he does, Martin Wattenberg, the computer scientist and mathematician, has chosen a room at Boston's Institute of Contemporary Art filled with more than 1 million plastic cups.

"Individually," Wattenberg said, "the cups are boring and meaningless. But when combined together with an interesting method, it does something profound." In this case, the artist Tara Donovan has used an algorithm to stack the cups in such a way that, when viewed en masse, they create a topographical model of a whimsical canyon that is so stunning that it's hard to remember that all you're looking at is a bunch of boring and meaningless 21-centiliter plastic cups.

This, Wattenberg says, is what he does with data. He works in data visualization, a discipline that is usually associated with number-crunching scientists. But Wattenberg has focused on visual explorations of culturally significant data — everything from baby name popularity to the history of the edits on the Wikipedia article about abortion — to create images that are both instantly illuminating and museum-quality beautiful.

His visualizations have been shown at the Boston Museum of Modern Art and, beginning next week, will be the featured exhibition for a two-month installation on outdoor screens in Harvard Square that are part of the Cambridge-based Lumen Eclipse public art project.

Wattenberg, 38, said he thought about nothing but math until he was in his mid-20s, but in the final year of studying for his doctorate in mathematics at the University of California, Berkeley, he fell in love with the potential of the Internet (which was still in its training wheels phase). So instead of pursuing a traditional academic track, he moved to New York to look for a job with a media company, and landed at Smart Money.

It was there that he got hooked on using graphics and interactivity to create new ways of seeing information, and helped create the influential "Map of the Market," which provided a simple color overview of the health of the financial markets. Green was good, red was bad; lately, the page has been awfully red.

In 2002, he moved to Massachusetts to become a founding manager of IBM's Visual Communication Lab in Cambridge, and he began exploring the emotional potential of data visualization. "The traditional approach to visualization in science and business is to create something transparent and neutral — a telescope with clear glass," he said as he roamed through the ICA exhibit. "But for an emotional approach, or an artistic approach, you want to bring a point of view. Not all data is interesting. The art is pointing the telescope at the right set of data."

An important moment in his career happened somewhat inadvertently, when his wife, Laura, got pregnant with their second child. "When we were choosing a name, I would propose them and then she would go to the Social Security Web site and get stats for names and then create graphs showing me what names were getting too popular." This back in forth eventually led her to write a book, 2005's *The Baby Name Wizard*, and Wattenberg created an interactive visualization for her Web site that charted name popularity over time. The tool became hugely popular, and made him start thinking about visualization in a new way: as a group collaboration.

He's recently been working with Fernanda Viegas, an IBM colleague, on two large public projects. *Many Eyes* is a site that allows users to upload their own data and create interactive visualizations that add something to a cultural conversation — Sarah Palin's word choice in her speech at the Republican National Convention led many to create visualizations. *Fleshmap* explores the relationship between the body and its visual and verbal representation; his visual explains such things as how often a particular body part gets mentioned in songs from different musical genres (eyes get the most mentions in country songs, while the derriere is tops in hip-hop).

"Martin's work is about democratizing visualization, making it for the masses and not just the elite," said Karrie Karahalios, an assistant professor of computer science at the University of Illinois at Urbana-Champaign.

"What makes him stand apart from the rest is that he's putting it out there as a catalyst for debate and discourse," Karahalios said.

Wattenberg, whose work can be found at bewitched.com, says that for all his mathematical and technical credentials, his view on the world is that of a humanist.

"It's about using the computer as a new way to learn about people and cultures," he said. "Almost everything can be reduced to data, so my job is analogous to the photographer. My projects are about what you choose to look at and how you crop it."

# A 2009 technology wish list – and why not?

BY **JAY DOUGHERTY**
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**W**ish lists often accompany celebrations around the beginning of a new year. And why not?

There's a lot to hope for — especially in the world of technology, which has always promised to help us do more with less.

Too often, though, technology ends up getting in our way rather than paving the path to our success. Here are some wishes for how technology could live up to its promise this year.

### 801.11N, AT LAST

The world badly needs the IEEE — the professional technical organization charged with ratifying wireless transmission standards — to finally ratify 802.11n, the next-generation wireless protocol that has been in the works for years now. Most of what we do on the computer is either tied to the Internet or headed in that direction, so fast connectivity to the Net has never been more important. 802.11n delivers speed — and lots of it. A good 802.11n-based network connection is as fast as a traditional wired Ethernet hookup.

Yet the 802.11n protocols on the market today retain the "draft" moniker, as the IEEE drags its feet in ratifying the standard. The delay hurts us all, for it slows the adoption of the faster gear, and the threat remains that the 802.11n "draft" equipment we buy today may not be fully interoperable with the ultimate standard. A fully ratified 802.11n specification in 2009 could help fuel continued innovation in Web-centric applications and bring a plethora of low- cost wireless products to the market.

### BLU-RAY AFFORDABILITY

Finally, the hi-def DVD standards wars are over, with Sony's Blu- Ray claiming victory over the competitor HD-DVD. So are millions of high-def fans celebrating by running out to the store and buying Blu- Ray players? Not exactly.

That's because the prices of those Blu-Ray DVD players and burners remains prohibitively high. Not many are going to hand over US$300, US$400, or even US$500 for a Blu-Ray DVD player when upconverting models that sell for US$50 can make today's DVDs look very close to Blu-Ray quality.

Sony has to lower its licensing prices, or else the company runs the risk of winning the standards battle but losing the war for the hearts and minds of technology consumers. In technology, achieving critical mass is as much about affordability as it is about a winning standard. Just ask Apple, which lost big to the world of IBM-compatible computers back in the 1980s by keeping its technology proprietary and its prices high. Let's hope Sony sees the light in 2009, before other technologies come along and make the DVD itself irrelevant.

### LOWER PRICES FOR SSDS

Today's hard drives — built around rapidly spinning magnetic platters — have been the primary performance bottleneck in personal computers for years. Manufacturers have attempted to improve performance by spinning the platters even faster, but there are always downsides to pushing this technology — namely, more heat and more noise. And no matter what performance-improving gimmick disk makers come up with, they cannot overcome the Achilles heel of traditional drives: they're fragile. In the millisecond it takes for a hard drive to "crash," all of your data can be gone — for good.

Solid state drives — SSDs for short — solve the bottleneck issue in a big way. Built using nonvolatile memory chips — the kind that don't lose what's stored in them when the power is turned off — these drives are many times faster than traditional hard drives for certain operations. Instead of waiting three minutes or more for your operating system to boot up, how does 20 seconds sound? And then there are the fringe benefits: no more noise, much less worry over data loss, low heat, and much lower power consumption.

The only downside currently is cost. You'll spend US$200 or more for a 64-gigabyte SSD, whereas the same US$200 will buy you two 1-terabyte traditional hard drives. Still, for notebook users, SSDs make sense now. Here's hoping that in 2009 prices for SSDs fall and capacities increase, making them worthwhile for desktop computer users as well.

### WINDOWS 7 AHEAD OF SCHEDULE

Windows users have become cynical over the years, as Microsoft has continued to promise a lot with each new release of Windows but deliver far less. By almost any measure, Windows Vista has been a flop, disappointing those who feel that the operating system's visual panache did not make up for its poor performance or compatibility woes.

But Windows users have a pleasant surprise coming in the form of Vista's successor, Windows 7. Microsoft released an early beta version of the operating system to members of the technology press, and even in its current form, Windows 7 shows that Microsoft has learned from its mistakes with Vista and is focusing on what matters most to users: responsiveness, intuitiveness, and low resource usage.
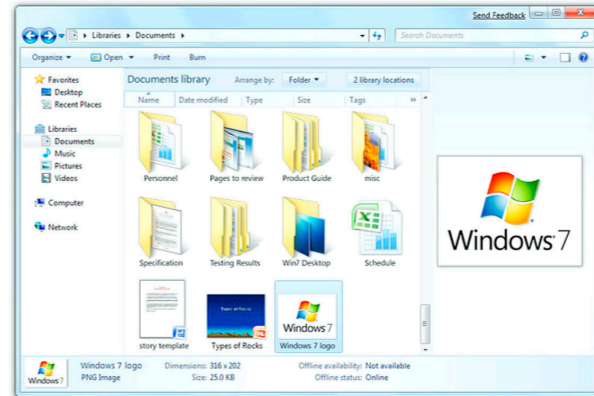
Even at this stage, Windows 7 looks like a polished product, and from the outset, the improvements in speed are apparent. One recent test showed Windows 7 to be faster than either Vista or XP, by a significant margin in some cases. Other annoyances are also gone: the obtrusive user account control (UAC) dialog boxes are less prevalent, and small interface improvements have been added at almost every turn to make your computing experience less frustrating.

Windows 7 is going to be good for the tech industry and good for computer users. Let's hope it makes its way to your desktop this year.

### MORE INPUT OPTIONS

Perhaps the most amazing thing about the rise of personal technology is that it has largely relied on input devices — the keyboard and mouse — that are uncomfortable, awkward, or error-prone to a large number of people.

As humans, we can do so much more by using our hands to touch and move objects and our voices to provide instructions and feedback. But technology products just haven't been smart enough to allow us to interact with them in those ways.

That's starting to change, and this year we have every right to hope that we'll have more natural input options available to us. Both Microsoft and Apple have clearly shown leadership in the touch arena. The iPhone's touch-centric interface has already inspired dozens of imitators, and Microsoft's Surface computing device is showing up in hundreds of public areas. Even Windows 7, Vista's successor, will reportedly support touch screens as well as traditional displays. Here's to hoping this year ushers in a host of new products that allow us to work more intuitively than the keyboard or the mouse does.

### BROADBAND TO THE HINTERLANDS

Now more than ever, if you're not connected to the Internet, you're not connected to opportunity, advancement, or the rest of the world. Unfortunately, slow or no Internet connectivity remains a fact of life for many around the world, especially those in remote areas.

Because stringing broadband lines to lower-density areas is often difficult to justify from a business perspective, it will be left to government initiatives and public imperative to make widespread access to high-speed Internet a priority. It can be done, and the long-term payoff of the effort and expense will be unquestionable, as more people are brought into today's globalized workforce and ultimately become significant contributors to local economies. Here's to hoping that this year we move resolutely toward making the availability of high-speed Internet access something that's closer to a right than a privilege.





Left: Apple's iPhone's touch-centric interface has already inspired dozens of imitators. Expect more of the same this year.
Center: Solid state drives are many times faster than traditional hard drives, make less noise and use less power.
Right: Windows users have a pleasant surprise coming in the form of Vista's successor, Windows 7.

PHOTOS: AGENCIES