Noninteractive Media

First-Place Winners

The Epigenetics of Identical Twins

Harmony Starr and Molly Malone, University of Utah

As children, identical twins are indistinguishable. But as they reach adulthood, physical differences develop: One twin may go gray earlier or the other's facial features may seem more youthful. This short video from the Genetic Science Learning Center at the University of Utah explains that one reason for this phenomenon is epigenetics, the chemical changes cells make to chromosomes.

The A, T, C, and G letters of our genetic code are familiar enough. But enzymes write another message onto the nucleotides of our DNA and our chromosome's proteins to control how our genes turn on and off.

Harmony Starr and Molly Malone tell the story of how two twins' epigenetic codes change with their different environments and life choices. The video starts with tubes of cotton batting clipped onto a clothesline to depict the chromosomes the twins inherit from their parents. Red-topped sewing pins pushed into each tube represent the chemical tags of each chromosome's epigenetic code. As the twins grow from infant to adult—visualized by a scroll unraveling from a rolling pin—hands place objects that symbolize environmental differences next to clothes baskets filled with each twins' chromosome tubes. With each new factor, such as an ashtray for smoking or a jump rope for exercise, the hands push more pins into the white tubes. By the end of the video, corresponding chromosomes from each twin have visibly different pin patterns dotting them.

This low-tech approach to explaining a technical topic was intentional: "Because there is so much use of computer graphics [in science videos], we hoped the style of this piece would catch people's attention with its simplicity and quirkiness," says the center's director, Louisa Stark. The judges agreed. "It was a delightful way to present an extraordinarily detailed scientific concept that is accessible and entertaining to an audience," says panel of judges member Alisa Zapp Machalek. "You could tell that the producers had a tremendous amount of fun conceiving and making it," says judge Thomas Lucas.

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Follow the Money: Human Mobility and Effective Communities

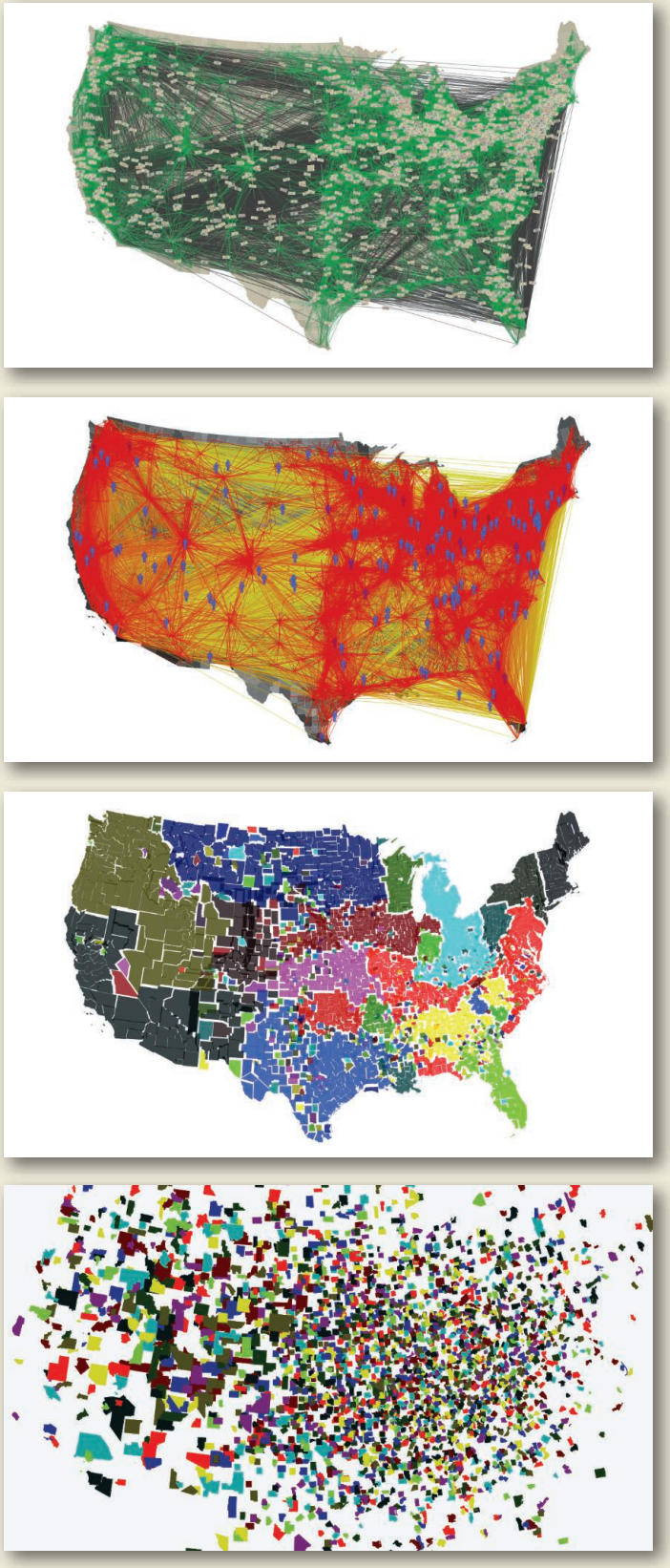
Christian Thiemann and Daniel Grady,
Northwestern University

Ever wonder where your dollar bills travel after you plop them down for a cup of coffee? The Web site Where's George? allows you to do just that: Record your bill's serial number and then track its journeys as other people spend it across the country. But it's more than just a game. Because every time a dollar is spent in a new place, it means someone moved it there. Christian Thiemann and Daniel Grady of Northwestern University in Evanston, Illinois, have been using the Web site's data to study how people move within the United States.

They produced this video to explain their project and animate the results. Tiny bills stretch out from county to county on a map of the contiguous United States. Some places, such as Los Angeles, California, have many bills passing through it from across the nation, while others, such as Anderson County in Tennessee—Grady's home—have just a few that mainly cycle locally. From this travel data, the team ran computer algorithms to find what they call effective communities within the United States. People tend to travel more within these invisible boundaries than outside them. In the video, counties flash and wiggle as the computer algorithm tries to decide which counties belong in the right community. "Normally, … you just push a button and wait for 2 hours and then all you get are numbers, which is really boring," Thiemann says. "But [the animation] makes the process visible and shows you how interesting it can be."

Grady hopes the video will stimulate other people to think up new ideas about what to do with these data. They've already started using it to study how diseases, such as H1N1, spread, and linguistics professors want to compare these travel boundaries to dialect boundaries.

Panel of judges member Corinne Sandone thought the video had a whimsical, quirky appeal, like that of independent films. "I liked the extreme geekiness of it and how it made me want to watch it again to absorb it all," says judge Thomas Lucas. "It was so rich."



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Honorable Mentions

Decision Support System for Tsunami Early Warning

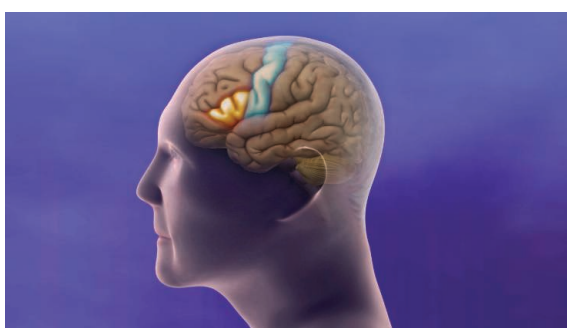
Gregor Hochleitner, Christian Gredel, and Nils Sparwasser, German Aerospace Center (DLR)

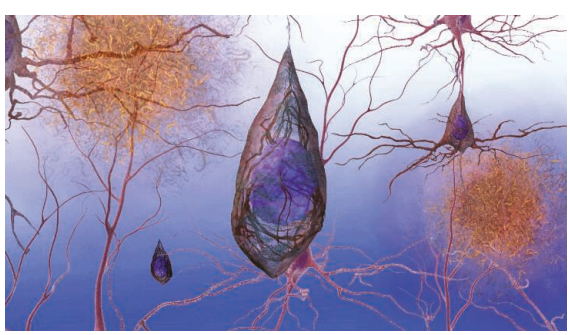
After the 2004 Indian Ocean earthquake triggered a devastating tsunami that killed more than 200,000 people, Germany and Indonesia designed a new system to warn people when a tidal wave is about to strike. Nils Sparwasser and his collaborators at the German Aerospace Center produced this video to explain how the new German Indonesian Tsunami Early Warning System combines data from underwater probes, orbiting global positioning system satellites, and floating buoys to better detect a coming tidal wave. Starting with a hypothetical earthquake off the coast of Sumatra, the video's animations show how the different components relay their information to a central decision-making center and how computers there then predict which areas should be evacuated. "We wanted to explain that the new system works with much more information [than previous systems]," Sparwasser says. "So if it generates a warning, they have a really good reason to evacuate."

Inside the Brain: Unraveling the Mystery of Alzheimer's Disease

Stacy Jannis, William Dempsey, and Rebekah Fredenburg, Jannis Productions

In a brain riddled with Alzheimer's disease, protein tangles grow and connections between nerve cells shrivel. This video by Stacy Jannis and her team at Jannis Productions in Silver Spring, Maryland, animates these microscopic damages to explain how the disease starts. The team produced the movie for the National Institute on Aging to depict scientists' most current understanding of what happens inside cells during the disease. The video's computer graphics animate the molecules that start the trouble: Enzymes snip amyloid precursor protein in the wrong spot to create fragments that form long, destructive plaques; meanwhile, tau proteins go awry and tangle up with other proteins in the cell. "A lot of people have a sense of how the disease affects a person's personality and mental functioning," Jannis says. "But we wanted to show that there are specific cellular reasons behind all of that."





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