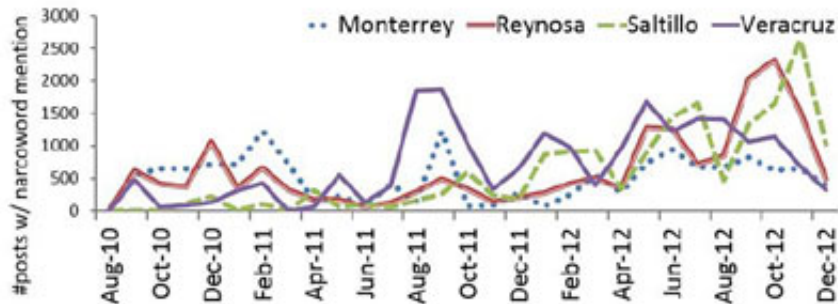# From drug wars to 3-D silhouettes

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Volumes of Twitter posts containing narco words.

When violence related to Mexico's drug war erupted in 2006, Andrés Monroy-Hernández kept in close touch with friends and relatives in the north of the country, where he is from and where much of the violence was concentrated. He soon learned that the local news media were avoiding the topic for fear of reprisals and that citizens were turning to Twitter and other social media to share information and create their own alert networks.

As the years passed and the shootings, kidnappings, and assassinations continued, Monroy-Hernández—a researcher at Microsoft Research's FUSE Labs who specializes in social computing—perceived a shift in the citizen reporting on social media.

"I started to notice how the events were still being reported, but in the same way people would complain about traffic," he says.

Panic, shock, and frustration seemed less evident, even as the death toll rose to at least 60,000 by 2012. He wondered if people were becoming desensitized to the violence—and he hoped that wasn't the case.

In 2012, Monroy-Hernández reached out to his Microsoft Research colleague Munmun De Choudhury, now a professor at the Georgia Institute of Technology, whose expertise includes emotion analysis. Along with a third collaborator, Gloria Mark of the University of California, Irvine, they set out to analyze huge data sets from Twitter to determine whether desensitization was in fact happening.

Their study resulted in a paper that will be presented during the Association for Computing Machinery (ACM) Conference on Human Factors in Computing Systems (CHI 2014) in Toronto, which opens April 26 and is organized by the Special Interest Group on Computer-Human Interaction (SIGCHI). It is one of 27 papers accepted for CHI 2014 authored or co-authored by researchers at Microsoft Research—and one of seven best-paper winners from Microsoft Research.

By analyzing and comparing Twitter activity from two periods, August 2010 and December 2012, in four major cities—Monterrey, Reynosa, Saltillo, and Veracruz—Monroy-Hernández and his colleagues found that despite consistent or increasing levels of violence, the Twitter posts exhibited distinct attributes of "affective desensitization," or emotional numbing, over time. These attributes included a lessening of negative emotion in posts that used "narco language"—terms that have emerged to describe specific atrocities associated with the drug war and circumstances under which murder victims have been found.

The researchers hope their findings can contribute to theories about socio-psychological responses to crisis, and they see important implications for public health, as well as for the role of civic media

during times of crisis. Not only Twitter but also Facebook and other social-media outlets might become important sources of insight into how communities respond to ongoing violence, and they could help determine what public-health interventions would best serve those communities.

Sensing Touch and Gesture

Another best-paper winner for CHI 2014 pushes the boundaries of motion-sensing and natural-user-interface technology beyond the types of 3-D sensing made popular by systems such as Kinect and Leap Motion.

David Kim and Shahram Izadi of Microsoft Research, along with interns and colleagues from Microsoft's Applied Sciences Group and several universities, created a vision-based system called RetroDepth that senses 3-D silhouettes and seamlessly combines that information with input from touch, pressure, in-air interaction, and input using objects such as a stylus.

"RetroDepth brings all these technologies into a single system, using high-precision 3-D cameras and a retro-reflector to detect hands and other objects," Kim explains. "One of the unique things about RetroDepth is that it senses only the contour of the object in 3-D, not the internal parts. But it does this at incredibly high precision."

It turns out that tracking silhouettes greatly reduces the amount of computation required compared with other depth sensors.

"We showed improved results over existing Leap and Kinect-based sensors for 3-D targeting," Kim says. "We also showed the ability of using our sensor for touch, with very high precision for a camera-based system. We even showed that we can sense pressure using overhead cameras."

The implications of RetroDepth for how humans could interact with computers are exciting.

"One minute, you might be interacting through a pen," Kim says, "and the next, you will switch to using 3-D in-air gestures and then touch and fluidly switch between these modalities."

Giving a Better Oral Presentation

Another team from Microsoft Research—Ha Trinh, Koji Yatani, and Darren Edge—is presenting a paper during CHI 2014 about using technology to prepare for oral presentations. Given the importance of presentations in professional and academic life—and how little time many people have for creating slides and rehearsing what they intend to say—the researchers sought a better, more efficient way to prepare.

The result is a system called PitchPerfect, an add-on for PowerPoint that helps people plan their content and improve narrative flow, offers cues for recall of content, and provides visual time guides and structured notes that can be removed gradually as the speaker becomes more confident with the material.

The system is informed by cognitive research about recall and memory, as well as how people associate visual cues with a verbal script. The researchers also interviewed 16 study participants about their presentation experiences, preparation techniques, use of notes, and other factors.

"When preparing to give a presentation, one of the biggest mistakes is spending too much time on the presentation visuals and too little time on the spoken delivery," Edge says. "This bias is part psychological and part technological: It feels better to 'polish' a document than to 'perform' a spoken rehearsal."

PitchPerfect breaks down the process into achievable milestones that include every key aspect of preparation. Participants in the study found that the system not only helped with readiness but also with efficiency of preparation.

"The overall finding was that structured rehearsal with PitchPerfect was indeed beneficial," Edge says. "Compared with regular PowerPoint rehearsal, we found that it significantly improved overall presentation quality and content coverage, as well as providing greater support for content mastery, time management, and confidence building."

Robust Participation

In addition to the papers being presented, Microsoft Research's presence for CHI 2014 will include a course taught by Bill Buxton called Sampling & Synthesis: The Two Sides of Experience Sketching. Buxton, a noted advocate of innovative product design, will explore the sketching experience and ways to sample the world for often non-obvious technologies that can serve as sketching tools.

Also at the conference, Buxton's Microsoft Research colleagues John Tang, Ken Hinckley, and Richard Harper will be inducted into the CHI Academy—an honor from SIGCHI. Buxton was a 2002 inductee.

Taken together, the contributions of Microsoft Research scientists to CHI 2014 exemplify the rich diversity of pursuits and topics found within the field of human-computer interaction. Not only computer scientists but also designers, psychologists, developers, and performing artists will be represented during the annual gathering, which is expected to draw about 3,000 people from 49 countries.

Provided by Microsoft