

# User-Generated Content



**U**ser-generated content comes from regular people who voluntarily contribute data, information, or media that then appears before others in a useful or entertaining way, usually on the Web—for example, restaurant ratings, wikis, and videos. The use of such content has seen rapid growth in recent years, in part because it's fairly inexpensive to obtain (users normally supply it for no charge). For content suppliers, the process can be

rewarding because it lets them receive recognition for their contributions. For consumers, besides the potential to inform or entertain, the content gives a glimpse into real data from other people, unsanitized by regular media outlets.

In this special issue, we're interested in user-generated content and experiences that move off the desktop and begin to pervade into other parts of our lives. It's already starting to happen as traditional forms of user-generated content,

such as product reviews and price comparisons, become available via mobile devices. But there's much more to pervasive user-generated content than just repurposing an existing Web site for mobile users, as demonstrated by the articles in this special issue. We identified four example categories of pervasive user-generated content and applications, each with its own set of interesting, innovative examples.

## Data Gathering

Sometimes, pervasive user-generated content is primarily an exercise in data gathering, followed by editing, annotation, and visualization or presentation. A prime example, presented in this special issue, is the OpenStreetMap project, whose aim is to create free road maps based on the work of volunteers who contribute GPS data and trace roads on satellite images or out-of-copyright maps. The project also hosts mapping parties, during which volunteers take to the streets with GPS loggers.

Related to road maps is the increasingly prevalent use of drivers as traffic sensors, such as Dash's commercially available in-car naviga-

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tion device that sends GPS data to a server for real-time traffic analysis. This issue also contains an article titled “Object-Blog System for Environment-Generated Content” that describes letting sensors act as bloggers to create their own posts—for instance, the amount of activity sensed by a user’s slipper or a door opening and closing.

Finally, the pervasive sensors used for gathering data can be purely human, such as the Beachcombers’ Alert project (<http://beachcombersalert.org>) in which anyone can report ocean flotsam, most famously the toy rubber ducks that spilled from a cargo ship in the Pacific Ocean, which researchers used to verify ocean-current models.

### Pattern Recognition

Although aggregating user-generated data is useful, finding patterns in it can help answer questions about the way the world works. Two articles in this issue exemplify how pervasive user-generated content can help find patterns in human behavior. Dirk Brockmann and Fabian Theis analyzed the circulation of paper currency and geocaching items to discover patterns in human movement. Their data comes from regular users who use the Web to enter the physical locations of things they find. Another article in this issue, “Digital Footprinting: Uncovering Tourists with User-Generated Content,” examines the mobility patterns of tourists in Rome based on their geotagged photos and mobile phone communications. The analysis reveals how tourists explore the city, including an interesting difference between a group of Americans and a group of Italians.

### Community Building

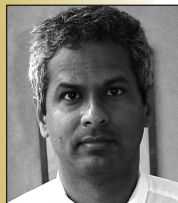
Gathering data and finding patterns can quantitatively exploit user-generated content, but such techniques work best with large numbers of contributors. A warmer, more intimate side of pervasive user-generated content is aimed at building community and raising awareness among localized groups



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of people. “Urban Social Tapestries” is an interesting retrospective of the authors’ various projects involving public authoring of local, neighborhood knowledge. Contributors use their mobile phones to add new content as they go about their everyday activities.

In the “Instant Places: Using Bluetooth for Situated Interaction in Public Displays” article, a group of researchers report on an experiment they conducted in a university bar with Bluetooth phones and a public display. Customers could control the display’s content by changing the Bluetooth name on their phones, which eventually led to short, back-and-forth conversations via the display.

### Public Art

Artists are increasingly incorporating user-generated content into their projects as well. Raul Vincent Enriquez created “I in the Sky,” which used a 2,500-square-foot display screen in New York City’s Times Square to display artistically enhanced pictures of subjects from a photo booth in a nearby art gallery.

Although the content came from regular users, the truly pervasive part about it was that so many people could see it as they went about their regular activities.

Another art piece with pervasive input is Dana Karwas’s freeSTYLE project. Her museum installation consists of a large display screen and audio speakers—people can send text or pictures to a certain email address, and the display will algorithmically create a music video from the transmitted content. Museum visitors regularly stood in front of the display, sending messages to it from their mobile phones.

**P**ervasive user-generated content is still a young idea, enabled by the growing ubiquity of digital networks and mobile devices. This issue’s contributed articles give successful examples of exploiting this content in surprisingly innovative ways, suggesting that we’ll see much more as researchers and entrepreneurs discover all the possibilities. ■