



## Internet photo site helps MySpace thwart porn

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By Julia Angwin, The Wall Street Journal

DENVER -- Working quickly, [Photobucket.com](http://Photobucket.com) employee Jeff Gers can look at nearly 150,000 images on his computer screen during an eight-hour shift, or about 300 a minute. His job is to find and destroy anything that might cause offense, a task that's getting harder all the time.

Every day, nearly four million new images pour into Photobucket, a Web service that allows people to store images and videos online, share them with friends and display them on other Web sites. He's come across pornographic snowmen, camera-phone snapshots of young people's anatomy and, quite frequently, an animated cartoon of a girl lifting her shirt. Occasionally, he sees child pornography.

The future of one of the Web's newest and most vibrant businesses lies in the hands of people like Mr. Gers. Photobucket is among the biggest sources of photos that appear on MySpace.com, one of a clutch of so-called social-networking sites that have exploded in popularity. There, people can write blogs, post photos and videos, and make connections to friends and strangers alike.

MySpace's ability to sell advertising, its primary source of income, depends in part on scouring the site for objectionable material. As part of that effort, MySpace last year contacted other sites that help users post material online, most notably Photobucket, and asked them to launch cleanups of their own.

Yet even though the basic elements of these Web businesses are computerized, no one has worked out an effective technology fix for the porn problem. Some scanning software has a hard time distinguishing between pictures of nudes and apple pie, and certainly can't make the subtle judgment calls required of Photobucket's human sensors. Naked breasts partly obscured with tape? OK! X-ray-like images of sexual acts? Delete!

Photobucket is having to hire an increasing number of people to manually check images as they flood onto the company's servers. It expects to spend \$1 million over the next year on content monitoring. With 30 people currently full time on the effort, Photobucket says it can filter more than half the images. Its goal is to check them all.

Many forms of new media, especially in ad-supported industries, have faced similar challenges. Viacom Inc.'s MTV has long walked the line between being edgy enough to be cool and safe enough for advertisers. For MySpace, any whiff of censorship could destroy the freewheeling atmosphere that attracts young people to these sites in the first place.

Media giant News Corp., which snapped up MySpace last year for \$580 million, has made headway selling ads on some of the site's main pages, but brand-name advertisers are leery about taking spots on pages created by MySpace users, which make up the vast majority. MySpace is now the eighth-biggest Web property, ranked by unique visitors, and is second

only to Yahoo in number of pages viewed a month, according to comScore Media Metrix. It has more than 75 million registered users.

Critics say it's too easy to stumble upon nude pictures and offensive language on MySpace, and both parents and schools are increasingly blocking children and teens from using it. Attorneys general from Connecticut and Massachusetts are demanding MySpace install filters to screen out offensive images, some of which come from Photobucket. Lawmakers in Congress have also proposed several measures aimed at cleaning up such sites.

In recent months, Verizon Communications Inc. and Starwood Hotels & Resorts Worldwide Inc. have pulled out of MySpace after discovering their ads running on users' pages near pictures of scantily clad women. Some advertisers have also been put off by an increasing number of media reports that sexual predators used MySpace to meet their victims.

"Advertisers are going to view social-networking sites with caution until all the necessary controls are in place," says Mark Kingdon, chief executive of Organic Inc., an online advertising agency owned by Omnicom Group Inc.

The rise of high-speed Internet connections in recent years has created an explosion in the number of consumers who can upload pictures and videos to the Web. Each new MySpace subscriber -- the company is adding 280,000 every day -- is entitled to post up to 12 photos on their personal MySpace page, which means a total of 3.3 million images can be added daily. That doesn't include changes made by existing users.

MySpace says it can monitor the photos and video posted directly onto its site. But MySpace users can get around the 12-picture limit by uploading additional images using links to Photobucket, among other services. Those pictures, which are outside of MySpace's direct control, can then be displayed on MySpace pages. At peak times, Photobucket's nearly 16 million users upload 90 new pictures a second, according to the company's engineers.

Big search engines such as Google and Yahoo offer "safe search" features that try to filter out X-rated images by looking, among other things, for clues in the accompanying text or in the hosting Web site. Both search engines say their filters don't catch everything.

For Photobucket and MySpace, the problem is more acute because uploaded photos usually aren't accompanied by much text. Both companies have tested computer systems and have run up against their limitations. Scientists don't yet understand how humans pick relevant information from a picture and discard the other details. As a result, no one has had much success programming a computer to do the same thing.

"Computers are fairly stupid compared to a toddler," says Margaret Fleck, a computer-vision researcher at the University of Illinois at Urbana-Champaign. "If you ask a computer to find the ducks or the cows in a picture it would be completely lost."

In the late 1990s Ms. Fleck and her husband, David Forsyth, also a University of Illinois professor, devised a program that tried to solve the problem. It aimed to spot pornography by identifying skin colors and body configurations. In a test, outlined in a 1999 paper published in the *International Journal of Computer Vision*, the program correctly identified 43 percent of the nudes and misidentified only 4 percent of the non-nudes.

The computer program became confused, however, by pictures of apple pie. Because the lattice crust was flesh-colored with a limb-like design, the software thought it was a nude.

Since then, many software companies have taken a different approach. Rather than build

algorithms based on body shape and position, they fed a number of pornographic images into a computer and then asked it to find commonalities. Each new picture is scored based on how similar it is to the inappropriate images.

DolSoft Inc., Burlingame, Calif., scores each photo on 150 different attributes such as proportion of dark space and complexity of the colors. In a test of 50,000 images, of which 50 were pornographic, DolSoft's software picked out 47 porn images, says its president, Shawn Smith. Unfortunately, it also identified as porn nearly 7,000 images that were not.

Human checkers still need to vet the images, Mr. Smith acknowledges, but using DolSoft's system, they would have to review only 7,000 instead of 50,000.

Photobucket Inc. was founded in 2003 by two engineers, Alex Welch and Darren Crystal, who saw a business opportunity helping users post extra photos on MySpace and other sites. To do so, they built a free site that lets users store photos, graphical art and video to be displayed elsewhere. It quickly became the second-largest photo-hosting site on the Web after Yahoo Photos, according to comScore Media Metrix.

The site earns most of its money selling ads on various pages, and not, like most photo sites, by selling prints. In addition, it charges customers who want more than 1 gigabyte of storage (equivalent to about 10,000 images). Photobucket says it had positive cash flow last year and has raised \$10.5 million in venture capital to finance its expansion.

Its success has made the site an integral part of MySpace's appeal. While Photobucket relies on the MySpace connection to win users, "MySpace would be very dark without the Photobucket content," says Mr. Welch, who is chief executive.

The pornography question has been nettlesome, however. Recognizing the limitations of computers, Photobucket last summer abandoned the idea of using only software as a filter. Customers would likely flee to competing sites if Photobucket accidentally rejected innocuous images. In a test, about two-thirds of the images flagged were not offensive.

"We learned right away that an all-artificial-intelligence system was very ineffective because of the high number of false positives," says Michael Clark, vice president of engineering for Photobucket. Instead, the company hired some part-time workers to review the photos.

In December, Photobucket came under pressure from MySpace to better police the images being posted on MySpace pages. Mr. Welch says he worried MySpace would shut off the Photobucket links without warning. To prevent that, Mr. Welch suggested the two sites define their respective legal responsibilities. A memo, which lawyers are finalizing, will outline how Photobucket and MySpace will work together to make sure images are monitored, he says.

In January, Photobucket installed a team of nine "content moderators" -- including Mr. Gers -- who sit in a windowless office in downtown Denver staring at images all day long.

The moderators work eight-hour shifts and are expected to sift through 200 images a minute, plucked at random from images being uploaded to Photobucket's servers. The moderators scroll down screens filled with pictures, looking for obvious nudity as well as nuances like see-through underwear, body paint, silhouettes and thongs.

The censors are told to kill anything that might not appear in a mainstream magazine, an admittedly loose standard. A bare bottom is not OK, but a bare bottom showing even a tiny sliver of thong underwear is fine. A cartoon that uses the word "nigga" is OK but one that uses "nigger" is not. Nipples and genitals painted or tattooed to look innocent are definitely

flagged.

"That's something the computer wouldn't catch," said Mr. Gers, 24, one recent day, as he zapped a picture of two snowmen sculpted into a sexual position.

When photos are deleted, a message shows up where the image used to be notifying viewers. Photobucket bans users if more than 30 percent of their photos are inappropriate. MySpace says it also kicks off people who repeatedly violate its terms of service.

Photobucket says only 0.7 percent of the images screened are flagged for a second round of review done by the same team. Still, that would be equivalent to 28,000 a day if all new images were screened.

Photobucket is adding two additional 10-person shifts at a call center in Iowa. Photobucket says it deliberately chose screeners from the heartland rather than coastal U.S. or overseas because it wanted them to bring a mainstream American sensibility to the job.

At the same time, it's going back to the drawing board to see if some technology-based filtering system could simplify the screeners' job. Photobucket says it will likely install at least one system to sort images into various categories before a human looks at them. It also plans to build a database of rejected images so that computers can look for exact matches.

Of three systems it tested recently, one correctly flagged 37 percent of objectionable images, one spotted 43 percent and the other flagged 99 percent. The test didn't include ordinary images, so Photobucket still doesn't know the false-positive rate.

The moderators see some images over and over again, including the animated cartoon of a girl lifting her shirt. The moderators have seen her so often, they've nicknamed her "Blondie." At least once a day they see minors in erotic or pornographic positions, which they report to authorities.

"Some days I wish I had a bottle of bleach under my desk so I could wash my eyes out," Mr. Gers says.

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