

NYT article – GPS tagging of digital photos

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The idea is not exactly fresh, and has been discussed in both NG's. I myself thought of this (and others did too) back in the late 80's before GPS had a user friendly constellation (or indeed before cheap receivers were available). [Then the idea would have been to 'stamp' the negative/slide with the lat/long, similar to the date marking systems].

One item I think would be useful would be to add the heading (direction the camera is pointing) to the tags. This would of course require a heading sensor, perhaps attached to the base of the camera (mag+gyro). Or perhaps simply recording the GPS TRK, and the operator has to take care to move in the direction of the scene prior to taking the photo. The focus distance is already a tagged item.

It occurs to me that in digital systems with serial data interfaces (USB, Firewire, other) a firmware upgrade would be all that is necessary to retrofit the capability of Rx'ing GPS data.

Anyway, good reading.

Cheers,
Alan

December 16, 2004
Digital Bread Crumbs for Your Photos
By AARON WEISS
New York Times

WHEN you release the shutter on a digital camera, it records more than just Aunt Millie's toothy smile. With each photograph, the camera attaches descriptive data – information like date and time, make and model, white balance settings and whether the flash was used. Among the 300 or more types of data that can be attached are Global Positioning System coordinates, pinpointing where the photograph was taken.

Most digital cameras cannot be connected to a G.P.S. receiver, so they cannot automatically tag images with coordinates. But interest in the combination is growing.

When Frederik Ramm, a software engineer in Karlsruhe, Germany, strapped a digital camera and separate G.P.S. receiver to his car and drove around northern Scotland, he posted his results to the Web in the form of a geographically navigable travelogue.

"I found myself driving just because I wanted to know what a certain road would be like, what views it would offer," Mr. Ramm said. "I first thought of a way to mount the camera inside, then of shooting photos while driving."

Using the G.P.S. receiver, he added, "seemed like the logical next step."

Visitors to Mr. Ramm's site can view his photos moving in any direction, or watch an automated slide show retracing his journey in its original sequence.

Geocoding digital photos is catching on beyond fancy vacation slide shows. Relating pictures to precise locations has obvious applications for archaeologists and cartographers, but also for real estate agents compiling listings and law enforcement officers conducting investigations.

Researchers can measure population distributions of plant species with highly accurate photojournals, or document the changing landscape of the California coastline, as Kenneth and Gabrielle Adelman have done with a helicopter, a digital camera, a G.P.S. receiver and a laptop computer.

As part of an effort called the California Coastal Records Project (www.californiacoastline.org), Mr. Adelman has taken more than 20,000 aerial photographs of the coast (except for a restricted area around Vandenberg Air Force Base near Santa Barbara) from a helicopter flown by his wife. "Photographing particular parts of the coast for the Sierra Club led to the idea," he said. "It was the digital photography and the G.P.S. interface that made it practical."

Mr. Adelman uses a Nikon D1x digital camera, a high-end professional digital model and one of the few that can directly communicate with a G.P.S. receiver. Currently available for around \$3,500 (without the receiver, which can run a couple of hundred dollars more), the six-megapixel D1x is not an inexpensive solution to combining location information with digital photography. Nor is its newer replacement model, the 12-megapixel Nikon D2x (at a cost expected to be near \$5,000), which Mr. Adelman plans to evaluate when it is released early next year.

A less expensive option is the three-megapixel Ricoh Caplio Pro G3, which has an optional integrated G.P.S. receiver and costs \$1,000 for the bundle.

Aside from the limited choice and high cost of G.P.S.-ready digital cameras, the physical tethers can also be unwieldy, complicating mobile operations. More often, geocoding enthusiasts favor the lower-tech solution used by Mr. Ramm – simply traveling with both their preferred digital camera and an inexpensive G.P.S. receiver, separate and unconnected.

Small G.P.S. receivers such as the hand-held Garmin eTrex series (\$110 to \$250) or wristwatch-based Forerunner series (\$80 to \$120) will record positions in a track log, updated at frequent intervals for up to several hours or more depending on the model. Because the digital camera records the date and time with each picture, as does the G.P.S. with each track point, the two can be compared later to produce G.P.S. coordinates for each photo.

A variety of software packages can download the track log from the G.P.S. receiver and apply the G.P.S. coordinates to the photo metadata – in effect retroactively tagging the pictures just as the expensive cameras do in real time. Free software such as StuffWare Photo Studio, World Wide Media Exchange Utilities, and OziPhotoTool can all update photo tags with track logs from popular G.P.S. receivers.

Once G.P.S. data has been tagged to digital photos, commercial software like G.P.S. Photo-Link (\$229) and TopoFusion (\$40) can generate maps using topographic or aerial data. With a photo record superimposed on a world map, you can quickly and easily relive a travel journey, see the distribution of photo subjects or visualize a historical record.

In the near future, more digital cameras will come with wireless Bluetooth capability, allowing them to communicate directly with Bluetooth-enabled G.P.S. receivers for instant geocoding with no wires.

Mr. Ramm predicts the trend will evolve both "from the bottom end of image quality, driven by mobile phones that are already commonly equipped with a camera and sometimes with G.P.S.," and "from the top of the quality scale, where digital cameras will be hooked to notebooks for immediate image processing."

Indeed, Mr. Adelman is already considering replacing his current setup with a higher-quality medium-format camera without direct G.P.S. input. But with it he plans to have a computer that can later match the G.P.S. data against the time stamps in the images.

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