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Data Mining the Airwaves

"Data mining" involves the use of computers, modeling software, and statistical analysis to ferret out data relationships that would have value for a particular segment of our society. In the same way that strip mining processes tons of soil and rock to find relatively small amounts of desired materials, data mining often searches massive databases to find subtle relationships that can lead to profits for a particular business.

Can a company data mine the radio-listening habits of local drivers to determine the best place to put their radio advertising dollars? Ed Silvestri, the owner of Yorktown Mitsubishi in Westchester, NY, told me that is exactly what his company now does to focus their advertising dollars at local drivers. He described how the Mobiltrak system (see Photo 1) gathers data on what

Photos courtesy Mobiltrak

Photo 1

individual drivers are listening to when they drive past his dealership on Route 202.

My first reaction was skepticism. Do radio receivers broadcast a decodable signal that can be used to determine tuned radio stations in passing vehicles? To find out, I called Morty Leifer, the chair of the electronics department at Rockland Community College. He told me that every radio and television contains the same superheterodyne radio circuit, which was invented in 1918. So the radio circuits in your car and television are the same, and all car radios broadcast a very weak signal that can be picked up and used to identify which radio station is being listened to in each vehicle.

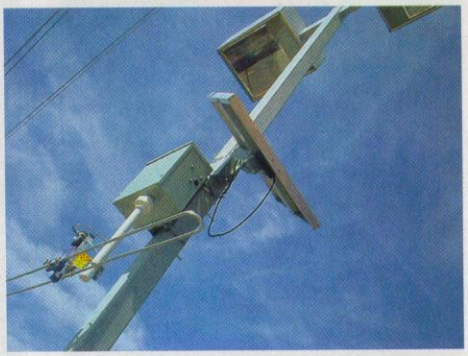

Photo 2

Leifer further indicated that a mobile truck from a cable company, with the right equipment, can even determine whether a household is watching a television station that should be scrambled on that family's payment plan.

Mike Degan, the director of operations for Mobiltrak explained how his company gathers data from the radios of passing motor vehicles. Mobiltrak's data-gathering units (see Photo 2) are all self-sufficient. They run off of batteries charged by their own solar panels. The communication between these data gatherers and Mobiltrak take place over the wireless Verizon cellular network.

"The units are sensitive receivers that listen for the emissions caused by the demodulation process that all radios use [they can pick up AM, FM, and even XM]. The demodulation process has to mix a local oscillator frequency into the received signal [tuned signal] to extract the audio out of the radio frequency. This intermediate step produces a unique offset signal that our receivers pick up and store in their processor's memory."

When Mobiltrak's servers, in Phoenix, AZ, receive this raw data from the individual receivers, they process it into reports that are available to participating companies over the web. The next time you pass an antenna array that matches the one shown in this article, you could be broadcasting your listening habits to Mobiltrak. You can learn more about this technology on the Internet at www.mobiltrak.com/about/index.cfm.

Recalling the Facts

1. What is the difference between "data mining" and "strip mining"?
2. Describe how each Mobiltrak unit is powered.
3. How do individual units communicate with the Mobiltrak servers?

Alan Pierce, Ed.D., CSIT, is a technology education consultant, technical writer, and public speaker on technology issues.