Mapping Mayhem
The Geography of Crime

By Gordon Young

"I felt safer doing my killing and burying in my home state. I guess I'm just a Carolina Southern boy at heart."

—Serial murderer Donald "Pee Wee" Gaskins, who tortured and killed more than 100 victims, mostly hitchhikers; executed in the electric chair September 19, 1991.

Murder will out. And computers can help.

Solving crimes has always demanded the best of human brainpower. Today, the power of the computer as an "intelligence amplifier" has been harnessed for crime scene investigation.

Predator

"Geographic profiling is a new science that uses information on the location of a serial predator's crimes to calculate the likeliest location of his home base," says Dr. Maurice Godwin (*www.drmauricegodwin.com*), professor of justice studies at Methodist College, Fayetteville, North Carolina; author of *Hunting Serial Predators*; and an expert at geographical profiling and other forensic statistical methods. He has developed his own computer program, called Predator, to do the tedious bull-work of repetitive calculation that a geographic profile analysis needs—exactly the kind of task computers were invented to do. "My program can do 10,000 calculations in seconds," Godwin states.

Running on a Windows 2000 or higher operating platform, Predator produces a colored 3-D graph—a "jeopardy surface." The highest point on the surface is the program's best guess of the criminal's home base, based on the data points the program has been fed. Godwin likes to use Global Positioning System (GPS) coordinates for at least five crime scenes to start an analysis. The descending slopes around the highest points reflect lessening chances of finding the criminal's home base. Superimposed on a street or highway map, Predator's graphic output gives investigators a center and direction for their search.

Unlike the criminal profiling popularized in movies like *Silence of the Lambs* or TV's *Profiler*, geographic profiling doesn't worry much about things like a serial criminal's age, sex, race, educational status, or psychological motivations. Rather, it focuses on the *where* and *when* of his crimes, putting together the locations of his crimes with known patterns of similar criminals (gleaned from cases previously solved) to predict as best as possible where his home base is. Multiple murderers like Ted Bundy or "Night Stalker" Richard Ramirez are the most notorious serial criminals, but geographic profiling can crack other crimes, like repeated rapes or arsons.

GPS and Serial Killers

With most murders, killer and victim know each other, and are often close family or acquaintances. "Nearest and dearest" is the old detective's maxim—start the search by suspecting the victim's intimates.

Serial murderers defy this rule, making them tough to catch. Victims are often strangers; the murders may seem motiveless. This can cause "linkage blindness." Connections between cases may be missed, especially when crime sites are scattered over different police jurisdictions.

Geographic profiling uses computerized statistical analysis to discover where a serial offender lives. When a serial criminal is suspected, the locations of his crime sites are fed into a computer. Sophisticated statistical analysis using "multivariate cluster analysis"—the study of how things group together, or "cluster"—churns through the data, trying to pinpoint where the criminal started from, and then returned.

Serial criminals usually operate inside a personal "comfort zone," a turf where they feel safe, powerful, and know their way around. This might be their own city neighborhood, a woodland where they've vacationed, the commuting route they take to work and back, or a type of area they know well—a university campus or strip mall, for example. Godwin's research has shown that, growing bolder and more experienced with each crime, they tend to operate closer and closer to home, inadvertently giving away the information needed to zero in on them.

Profiling programs use rules like the following: Take the two crime scenes furthest apart. Draw a line between them. Use that line as the diameter of a circle. The criminal's home base will usually be inside that circle.

Astonishing Successes

Some successes have been astonishingly accurate. Godwin's profile for a series of rape/murders in Raleigh, North Carolina, predicted a home base one block from where slayer John Williams, Jr. actually lived—and also nailed the man's age, race, employment, and marital status.

Even if it doesn't pinpoint the criminal's exact address right away, geographic profiling gives police the best possible starting point for traditional dogged door-to-door inquiries. It can also identify what part of a city to target resources for maximum effect, like leaflets mailed to every address warning residents and asking for any witnesses to come forward, or searching computerized databases by ZIP code, looking for likely suspects. When DNA evidence is available—a serial

rapist's semen, perhaps—the exhaustive collection of DNA cheek swabs can rule out area residents one by one.

In cases of serial murder, investigators have one crime scene pinned down for certain: the body dump site. But Godwin's research on more than 50 American serial killers and hundreds of their victims has proven that a more elusive crime site—the point where predator and victim meet—can tell more about where the predator starts and returns. This point often must be approximated by using the place where the victim was last seen alive. "The site where the victim was last seen can be developed from any number of sources, such as eyewitness accounts, visual sightings, telephone conversations, and official documents like traffic citations, police field reports, jail booking logs, long-distance calls, toll records, and credit card receipts," Godwin says.

Other Profiling Packages

Predator isn't the only geographic profiling package around. Dr. Kim Rossmo, another prominent profiler and a former police detective inspector, markets a package called Rigel. Patented proprietary software, Rigel costs about $55,000, and requires a specialist with years of training to interpret its results. So far Rigel is most popular internationally, used by forces in Canada and Britain, and by the U.S. Bureau of Alcohol, Tobacco, and Firearms.

Dragnet is another geographic profiling program, this one available to qualified personnel as open-source software from its author, Dr. David Canter, director of the Center for Investigative Psychology at the University of Liverpool, England, and an associate of Maurice Godwin. The National Institute of Justice uses an in-house package called Crime Stat.

It's possible to test the different programs by feeding them data from cases already solved, then seeing how closely they pinpoint where the serial criminal lived—sort of like doing a math problem with the answer tucked in the back of the book. Fed the locations of the 1977 "Hillside Strangler" murders in Los Angeles, Predator came up with a location right across the street from the home of one of the two killing cousins.

Yet computers are neither crystal ball nor Ouija board. Not enough data is still not enough data. In an experiment with 21 Liverpool university students, once the students were filled in on the decision-making rules Dragnet uses, they did pretty much as good a job as the program when working with only the first five crime sites of American serial murderers. ❑