

Using DERIVE[®]'S Graphics Tools For Geographic Profiling of Serial Offenders

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ABSTRACT

While crimes committed by serial offenders do not constitute the majority of most police investigations, their occurrence attracts much media attention and has also been the subject of research by a committed group of social scientists. This presentation is based on the work began in 1981 by Brantingham and Brantingham (Environmental Criminology) who developed the idea of a “buffer zone” that offenders seem to establish about their home base or base of operations and the subsequent extension in 1987 to the idea of working from data on crime scene locations and nature of the crime back to the home base by D. Kim Rossmo (PhD Thesis, Simon Fraser University). Rossmo uses an exponentially distributed probability model based on the size of the offender’s buffer zone, the size of the hunting area, scaled exponential functions, and the number of sites included in the model. In 2000, David Cantor and colleagues (*Journal of Quantitative Criminology*) explored various models for quantitative profiling, including Rossmo’s model. Cantor examined 70 examples of serial offences and found that the exponential model using a specifically designed normalization parameter produced a dramatic reduction in the search costs of location the operational base of the serial offender. In both Rossmo’s and Cantor’s approaches maps were placed on a grid, and the locations of the offenses were marked. Probabilities were assigned to several points on the grid based on the exponential probabilities that the point was the offender’s base.

In this presentation maps from several known serial criminals’ exploits will be placed on the DERIVE graphics screen and grid points uniformly chosen and assigned probabilities using scaled exponential decay functions. Those with a suitably high probability will be shaded and help to define the search area for locating the home base of the serial offender.

Keywords

Serial crime, negative exponential function, regression axes, graphical display