CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
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Project Number
31366

Project Title
An Application of Geographic Profiling to Graffiti Crimes

Abstract

Objectives/Goals
The purpose of my project was to see if it is possible to successfully use an already established formula(Rossmo's formula), which is used to predict the residences of serial murderers, rapists and arsonists based on their past crimes, for graffiti crimes.

Methods/Materials
This process involved taking a set of known graffiti locations and matching them with four known vandalswhose residences were approximately known. Using Matlab#, I was able to write programs that allowed me to perform various regressions to solve for empirically determined constants and exponents in Rossmo's formula. Theoretically, these values could then be used to try and predict the locations/residences of unidentified graffiti vandals. Data on graffiti locations and vandal residences were acquired by a combination of interviews with the Santa County Sheriff's Department, the Santa Cruz city planning department; there was also some data simulation required

Results
After all empirically determined values were solved for to most accurately fit the crimes of all four vandals, the algorithm in general did not produce probability contours that consistently overlapped with the actual offender residences.

Conclusions/Discussion
Overall, the algorithm has very minimal predictability value for graffiti crimes. Either a different equation needs to be utilized or mathematical modeling is not the most efficient means of locating offenders.

Summary Statement
My project is to examine the usefulness of an algorithm, which is used to catch seriel criminals, when applied to graffiti crimes.

Help Received
My parents, Quentin Williams and Elise Knittle,let me use the MatLab Software that they have in their geology lab at UCSC. Sheriff Robin Mitchell gave me information on specific vandals and graffiti patterns in general. J. Guevera provided me with a database of graffiti crime addresses in Santa Cruz City.