Algorithmic Criminology

Technology as we know has come a long way since the development of electronic computers in the 1950s. With the advancement in technology, people will find ways to take advantage of others through technical and other means. Some of those means may be illegal and criminology, the scientific study of crime and criminals, adapts to the advancement in technology through algorithmic criminology.

Algorithmic criminology is also known as computational criminology and it is an evolving mixture of criminology, computer science, and applied mathematics. Brantingham (2011) concludes:

The field of computational criminology involves using computational power to identify: (1) patterns and emerging patterns; (2) crime generators and crime attractors; (3) terrorist, organized crime and gang social and spatial networks as well as co-offending networks; and, (4) cybercrime.

Algorithmic criminology can be summed up as the study of data to determine why certain crimes are committed and the chances of that crime being committed again using different variables and procedures.

As important as data analyses is in the field of algorithmic criminology, it takes a back seat to the procedures used. Richard Berk is a professor of statistics and criminology in the University of Pennsylvania. He states that, “Procedures from computer science and applied
mathematics are used to animate theories about crime and law enforcement; data plays a secondary role either to help tune the simulations or, at least ideally, to evaluate how well the simulations perform” (Berk, 2012). The procedure used for algorithmic criminology will differ depending on the analyses undertaken and the subject-matter concept. In a presentation by P.L. Brantingham, a student at the school of criminology in Simon Fraser University, a few of the producers used are illustrated, “Algorithms are developed using computational topology, hypergraphs, SNA, KDD, agent based simulations, dynamic information systems analysis and more” (Brantingham, 2011). The procedure that is used depends on the input variable and how many input variables there are.

Procedures used for algorithmic criminology are also commonly called data mining techniques. Data mining is an investigative process intended to explore data, usually large amounts, in search for steady patterns and/or systematic associations between variables (Data Mining Techniques, 2001). Predictive data mining technique is commonly used in algorithmic criminology and attempts to predict the outcome variable given a set of independent variables. Rebecca P. Ang is a student in the Nanyang Technological University, and in her scholarly article she states, “Predictive data mining is typically an iterative three-step process involving model construction, evaluation, and usage” (Ang, 2013).

In algorithmic criminology, categorical outcomes are much more common than quantitative outcomes. Professor Richard Berk (2012) considered a 3-dimensional scatter plot:

The response is three color-coded kinds of parole outcomes: an arrest for a violent crime (red), an arrest for a crime that is not violent (yellow), and no arrest at all (green). There are two predictors in this cartoon example: age in years and the number of prior arrests.
From the scatter plot that is illustrated on page 9 of *Algorithmic Criminology* by Berk, it can be established that younger individuals and individuals with (many) prior arrests are more likely to be arrested for violent crimes. The right side of the scatter plot shows that older individuals might have fewer prior arrests and more likely to have no arrests. By studying that scatter plot, one can come to the conclusion that younger individuals tend to break the law more often than older individuals.

Algorithmic criminology is a rarely used criminology because it requires a large amount of data. It is a method that allows authority to predict a criminal act by an individual based off of past offenses, social interactions, and other variables. With the advancement of society would it be constitutionally permissible to make an arrest based solely off of the result compacted by the algorithmic criminology procedures?
References

