GEOG 494L & 694X – GEOGRAPHIC PROFILING, CRIME MAPPING AND MODELING  
Lectures & Labs Tuesdays and Thursdays 11:30am - 12:45pm  
Department of Geology And Geography

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Geographic Information Systems (GIS) and spatial analysis in the analysis and modeling of crime events and scenes have become increasingly important. New software specific to the analysis of crime events (STAC, CrimeStat), the establishment of the Mapping & Analysis for Public Safety (MAPS) program in 1997 (http://www.ojp.usdoj.gov/nij/maps/index.html), the organization of crime mapping research conferences (http://www.ojp.usdoj.gov/nij/maps), and the dissemination of crime maps and related information by police departments through their websites (http://www.ojp.usdoj.gov/nij/maps/related.html) provide examples of recent advances in spatial approaches to criminal investigations.

COURSE OBJECTIVES:

1) Understand and be able to describe the roles that geographic information systems and technology play in contemporary crime analysis, including crime mapping, forensic analysis and homeland security

2) Demonstrate geographic information technology relevant to law enforcement operations, and understand the advantages and disadvantages of implementing these technologies. Students will examine various Geographic Information Systems approaches relevant to:
   a) Crime Mapping
   b) Geographic Profiling
   c) Investigative and Forensic Sciences

3) Utilize the Internet and search engines to research and document a variety of technologies and crime information applicable to law enforcement.

4) Create a specific applied research project focusing on crime or problem analysis directly related to the student’s forensic interests, allowing the student to scope out and design a specific research effort (final class project).

5) Present this technology in a research project to colleagues, offer constructive criticism and positive feedback to each student for improving each student’s findings.

Initially we will review ArcInfo GIS software for the input, storage, analysis and output of spatial data. You will learn how to make thematic crime maps and the course introduces you to some relevant statistical concepts.

A major emphasis of this class is crime incident analysis and modeling using ArcInfo GIS, CrimeStat III and GeoDa software tools. We will discuss important concepts in crime analysis: including types of spatial distributions and theories and concepts in environmental criminology. Two sets of methods are particularly important in the analysis of crime events: the first set seeks hot spots, cold spots (places of low incidence or rates) and spatial outliers (unusual occurrences). The second group is concerned with the investigation of serial offenses. Geographic Profiling is the term that has been used in criminology and forensics to describe the application of spatial analysis to the identification of the location of a serial offender’s residence, likely haunts or other base.
PREREQUISITES FOR THIS COURSE: Junior / Senior / Graduate Status


READINGS: Readings will be handed out during class time and can be downloaded from the Internet. This information complements class discussions and provides additional references for more detailed studies.

LABS: Lab assignments will be handed out and discussed during class. Students will be expected to use the lab periods for guidance and assistance in completing the exercises.

GRADING: This is a seminar and your participation is vital.
- 30% of the grade will be comprised of your completion and presentation of ‘position papers’ based on the readings coupled with your participation in discussions.
- 30% will be comprised of lab projects assigned to further your understanding of the uses of GIS and spatial data related to forensic science and crime mapping.
- 40% will be derived from a term paper.
SOFTWARE


CrimeStat III: Is a crime analysis and modeling software. Crime data have to be in the form of coordinate pairs (x- and y-coordinates). It can be downloaded for free from the following website: http://www.icpsr.umich.edu/NACJD/crimestat.html/

GeoDa: Can be downloaded for free from the following website: http://sal.agecon.uiuc.edu/geoda_main.php

DATA SETS

Street network data

Census TIGER/2000 street network data can be downloaded from the Geography Network at the ESRI website (http://www.esri.com/). TIGER stands for Topologically Integrated Geographic Encoding and Referencing files.

Census data

Can be downloaded from the Geography Network at the website: http://www.geographynetwork.com

Imagery

Digital Orthophoto Quarter Quadrangle (DOQQ). DOQQ’s are 3.75-minute color infrared (CIR) orthophotos for West Virginia at one meter or about three feet resolution. The can be downloaded from the WVGIS Tech Center website (http://wvgis.wvu.edu/)

High-resolution orthoimages. These orthoimages are natural color orthophotos at 0.3-meter pixel resolution (approximately 1-foot) dating from 2002. They provide imagery for a 1,500- by 1,500-meter block on the ground and consist of 5,000 by 5,000 raster pixels.

Crime Data

From

FBI Clarksburg
Morgantown PD
Dominion Post

1999 burglary rates in Boston, MA at the census tract level

1991-1997 homicide data from Baton Rouge, LA. This data set includes the location of all crime scenes, the offender’s residences (when known) and the victim’s residences (when known).

1999 locations of residential burglaries (only serial offenders) from London, UK

36 locations of body dump sites, including the dispersal locations of all skeletal elements. Data were collected by anthropologists from the Louisiana State University Forensic Anthropology and Computer Enhancement Services (FACES) Laboratory between 1984-2005.
References

Anselin, Luc. 2004a. GeoDa 0.9.5-J Release Notes. Spatial Analysis Laboratory and Center for Spatially Integrated Social Sciences (CSISS), Department of Agriculture and Consumer Economics, University of Illinois, Urbana-Champaign.


