

## SOME POSSIBILITIES OF SPATIAL ANALYSIS OF CRIMES IN POLICE WORK

Nenad Milic

Academy of Criminalistics and Police Studies, Belgrade

**Summary:** Crime does not occur randomly. It tends to concentrate at particular places for reasons that can be explained in relation to victim and offender interaction and the opportunities that exist to commit crime. If the police knew where crime is concentrated (where are the hotspots) resources could be directed in order to take proactive actions. In order to identify hotspots, spatial distributions of crimes should be examined. Patterns in data must be identified, and underlying (spatial) processes must be understood in order to be effective in crime prevention. This could be achieved using spatial analysis techniques. In cases where spatial distribution is not complex and visually overwhelming the simple “eyeball method” should be sufficient. But in cases where spatial distribution of a large number of crimes (events) is present, the spatial statistics is needed. Spatial statistics help cut through some of the subjectivity to get more directly at spatial patterns, trends, processes, and relationships. Today, the most commercial GIS solutions already have more or less developed statistical capabilities. In cases where built-in GIS statistical capabilities are not sufficient to satisfy particular research need, they must be supplemented by specialized statistical software. An example of the usage of spatial statistics is shown on the practical example using commercial robberies dataset in one of Belgrade’s municipalities. The crime distribution is assessed using centographic measures (mean centre, centre of minimum distance, standard deviation ellipse). Centographic measures allows us to visualize a complex spatial trend, how quickly the mean centre moves, and where it moves, is there changes in dispersion and/or orientation of the crime distribution etc., providing valuable information about the spatial processes promoting this crime shifts. The level of clustering was assessed calculating nearest neighbour index and finally clusters (i.e. hotspots) were identified using kernel density tool. Kernel density maps provide a realistic and accurate image of the location and shape of the hot spot distribution. In order to achieve complete understanding of the dynamics of crime activity at the hot spots, the analysis of spatial distribution isn’t enough. Spatial analysis should be accompanied with analysis of time distribution of crimes at hot spots. This paper concludes that spatial analysis and spatial statistics techniques must be used in everyday crime mapping efforts aimed to provide analytical support to police decision making from tactical to strategic level.

**Keywords:** spatial analysis, spatial statistics, crime mapping, GIS, police.