Investigating Crimes using Text Mining and Network Analysis

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Abstract

In these days, security of citizens is considered one of the major concerns of any government in the world. In every country, there is a huge amount of unstructured texts coming from investigating offenders in police departments. As a result, the importance of crime analysis is growing day after day.

There is a little research; in methods and techniques that extract criminal networks from unstructured investigations texts especially in Arabic language. In our proposed system, we climb three main distinct contributions to discover forensics using investigation documents. The first by extracting offender names from unstructured text. Secondly, by constructing a crime network from real Arabic investigation documents. Finally, we provide analysis of the interaction between offenders in different documents that directly and indirectly related used to discover a new clue used to solve the crime puzzle. To evaluate the performance and effectiveness of the proposed system, real unstructured documents about investigations are obtained from police departments in the Gaza Strip. The experimental results show that the proposed system is
effective in identifying proper offender person's name from real Arabic Documents. The average
results for our system using the F-measure is 89% also the average of F-measure in a
proposed algorithm for discovery hidden relationship arrive to 92%. In addition; we found that
our approach achieves best F-measure results in most cases.

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Index Terms

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Criminology, Text Mining, Crime investigation, Criminal Networks, law enforcement.