Text and Social Network Analysis as Investigative Tools: A Case Study

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1. INTRODUCTION

This paper explores the intersections between the law and the computational social science (CSS) paradigm by focusing, in particular, on text and social network analysis. We will present ongoing research about the applications of computational methods in the analysis of structural and functional features of criminal organizations. Inspired by a sociological study using network analysis techniques to compare the characteristics of two criminal organizations belonging to Sicily’s mafia and Campania’s camorra, the research aims at studying tools combining information extraction, network analysis and visualization methods to support investigation and the fight against criminal organizations. After a brief introduction to social network analysis (SNA) and its applications in the legal field, the paper offers an overview of the results so far achieved from a technical and methodological point of view sketching future developments that appear to be challenging both for criminology and legal informatics.

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2. **Social Network Analysis**

Social network analysis is a theoretical and methodological approach to the study of social phenomena\(^1\) whose origins can be traced back to the 1930s. Ideally stemming from the intuitions of the sociologist Georg Simmel\(^2\) and of the psychosociologist Jacob Levi Moreno\(^3\), SNA aims at analyzing and understanding forms of social life as distinct from their content: instead of focusing on individuals and their attributes (gender, age, instruction, economic status, opinions, etc.), or on macro social structures, it centers on the relations between individuals, groups, or social institutions.

In the SNA perspective, to study society is to study social actors within the network of relations in which they are emerged, seeking explanations

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\(^2\) With his Formal Sociology, Georg Simmel pioneered many concepts of SNA. According to Simmel, relationships that individuals create in their continuous interactions clearly influence the action of the subject. Therefore, the task of sociology is to isolate the forms of social life abstracting them from their concrete content. Simmel wanted to develop a geometry of social life in order to investigate it in a quantitative and operational way: “Geometric abstraction investigates only the spatial forms of bodies, although empirically these forms are given merely as the forms of some material content. Similarly, if society is conceived as interaction among individuals, the description of the forms of this interaction is the task of the science of society in its strictest and most essential sense”, see G. SIMMEL, *The Study of Societal Forms*, in Wolff K.H. (ed.), “The Sociology of George Simmel”, Glencoe, The Free Press, 1950, pp. 21-22.

\(^3\) Jacob Levy Moreno is known, among other things, for being the father of Sociometry, the quantitative method for measuring social relationship. In 1937, he began to publish the journal *Sociometry: a Journal of Inter-Personal Relations*. On the sociometric paradigm, see J.L. MORENO, *Sociometry, Experimental Method and the Science of Society. An Approach to a New Political Orientation*, New York, Beacon House, 1951.

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