

Preface

Predictive policing is promising for crime reduction and prevention to increase public safety, reduce crime costs to society, and protect the personal integrity and property of citizens. Strategic law enforcement operations aiming at proactive intervention in criminal activities can be a viable alternative to simply reacting to criminal acts. New methodologies in data science along with emerging applications of big data analytics to crime data promote a paradigm shift from tracking patterns of crime to predicting those patterns. Crime data analysis as presented in this book concentrates on relationships between offenders to better understand their criminal collaboration patterns through social network analysis. Law enforcement agencies have long realized the importance of co-offending networks for designing prevention and intervention strategies. According to Reiss (1988), understanding co-offending is central to understanding the etiology of crime and the effects of intervention strategies.

The objective of this book is to bring into focus predictive policing as a new paradigm in crime data mining and introduce social network analysis as a practical tool for turning crime data into actionable knowledge. The book systematically studies co-offending network analysis for various forms of criminal collaborations, starting with a formal model of crime data and co-offending networks to bridge the conceptual gap between abstract crime data and co-offending network mining. The formal representation of criminological concepts presented here allows computer scientists to think about algorithmic and computational solutions to problems long discussed in the criminology literature. This includes criminal network disruption, suspect investigation, organized crime group detection, co-offense prediction and crime location prediction. For each of the studied problems, we start with well-founded concepts and theories in criminology, then propose a computational model, and finally provide a thorough experimental evaluation, along with a discussion of the results. This way, the reader will be able to study the complete process of solving real-world multidisciplinary problems.

The targeted audience of this book includes researchers in computer science and criminology who are interested in predictive policing as an emerging

multidisciplinary field as well as practitioners in collaborations between law enforcement and academia who search for novel and practical ideas to take predictive policing to the next level.

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Concepts, Models and Methods**

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