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REVIEWING THE ROLE OF NETWORK SCIENCE IN MODERN DEFENCE: AN APPRAISAL OF NETWORKS AND NETWORK ANALYSIS

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Abstract
It is intended in this work to review the book "Networks and Network Analysis for Defence and Security", 978-3-319-04146-9 published in Springer Series "Lecture Notes in Social Networks". In this book the following areas are covered: Defence and security risk analysis; Criminal intelligence; Cybercrime; Cognitive analysis; Counter-terrorism and Social Network Analysis; Transnational Crime; Critical infrastructure analysis; Support to defence and security intelligence, emphasizing the idea that network analysis is a "key enabler in supporting defence and security". Not only man-made threats against nation's security are considered but also the ones resulting from natural hazards. With the emergence and enormous progress in "big data" analysis together with innovative interpretative approaches, network analysis facilitates a greater understanding of complex networks: their entities, interdependencies and vulnerabilities.

Keywords: Networks, networks analysis, defence, security.

Introduction

A. J. Masys, Editor of this book, identifies in the preface some of the main threats to the nation's security, individually or globally:

- Natural hazards
- Acts of armed violence
- Terrorism
- Transnational crime with impact/target in the following domains:
- Physical
- Social
- Economic
- Cyber

Emphasizing the social and economic costs associated to these occurrences. From this results the importance of studying and analyzing these situations with rigor and efficacy, being network analysis the tool able in helping to support defence and security.

In the book is stressed the contribution of network science in the following areas:

- Defence and security risk analysis
- Criminal intelligence

- Cybercrime
- Cognitive analysis
- Counter-terrorism and Social Network Analysis
- Transnational crime
- Critical infrastructure analysis
- Support to defence and security intelligence along 12 chapters:
- Network Analysis in Criminal Intelligence
- Identifying Mafia Bosses from Meeting Attendance
- Macrosocial Network Analysis: The Case of Transnational Drug Trafficking
- Policing the Hackers by Hacking Them: Studying Online Deviants in IRC Chat Rooms

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- Why Terror Networks are Dissimilar: How Structure Relates to Function
- Social Network Analysis Applied to Criminal Networks: Recent Developments in Dutch Law Enforcement
- The Networked Mind: Collective Identities and the Cognitive-Affective Nature of Conflict
- Conflict Cessation and the Emergence of Weapons Supermarkets
- A Conspiracy of Bastards?
- Decision support Through Strongest Path Method Risk Analysis
- Critical Infrastructure and Vulnerability: A Relational Analysis Through Actor Network Theory
- Dealing with Complexity: Thinking About Networks and the Comprehensive Approach

The only enumeration of these twelve titles is a truthful description of the effective cover of the book. From there it is possible to understand its completeness. In fact almost all kind of defence and security problems are here typified. It is almost impossible not to classify any defence or security problem in at least one of the presented cases studied.

In addition, the methodologies used in the performed studies, many and various, are adequate and used very creatively. So the authors of this work contribute very much to increase the knowledge in this field.

Not also that some of the chapters are based in some countries practical experience. For instance

- Identifying Mafia Bosses from Meeting Attendance
- Social Network Analysis Applied to Criminal Networks: Recent Developments in Dutch Law Enforcement A Conspiracy of Bastards? and in globally experienced phenomena, for instance
- Macrosocial Network Analysis: The Case of Transnational Drug Trafficking
- Policing the Hackers by Hacking Them: Studying Online Deviants in IRC Chat Rooms

- Conflict Cessation and the Emergence of Weapons Supermarkets

The texts are elegant and well written, facilitating the reading of the book. But due to the diversity of the knowledge required some readers must read previous texts before accessing these ones.

1. Complexity and Networks

The problems dealt with in this book are approached as complex problems, in the sense that they are problems about which there is a lot to learn, although very much is already known. So they are good research subjects.

The networks methodology is imperatively considered, since in the models used to study defence and security problems is involved a great number of connections that must be considered to understand, first, and then to solve them.

In approaching a complex problem, no one can say in the beginning which methodologies to use or contemplate. This is possible only in a later stage. The first approach to carry is the "good sense" one. Still less there are protocols or routines established. This happens only in the future when something is known. Then the number possibilities faced in the beginning is enormous, not being disposable the possibility of creating new ones.

Also there is a significant challenge in the fact that a lot of models impose the human behavior modeling what, happily, will never be completely possible in mathematical terms.

All this makes the study of these problems enriching and rewarding for the researchers. And this is present along the whole book, giving the idea that it was written by wise happy people.

2. Overall Review

Natural hazards, acts of armed violence, terrorism and transnational crime with impact/target in the physical, social, economic and cyber domains are a kind of defence and security problems for which the network analysis, facilitating a greater understanding of complex networks: their entities, interdependencies and vulnerabilities, is the appropriate study approach. This is the thesis exposed in the book "Networks and Network Analysis for Defence and Security", 978-3-319-04146-9 published in Springer Series "Lecture Notes in Social Networks". It is done in a very convincing way, in a text scientifically rich and very well written. Manmade and nature origin threats are both considered. Recommended either for beginners or experienced investigators, some texts possibly requiring previous readings of other lower level texts.

Reference

A. J. Masys (Ed.). Networks and Network Analysis for Defence and Security. Series: Lecture Notes in Social Networks.