

Chapter 12

**CONCLUSIONS AND FUTURE  
DIRECTIONS**



In this book, we discuss technical issues regarding intelligence and security informatics (ISI) research to accomplish the critical missions of national security. We propose a research framework addressing the technical challenges facing counter-terrorism and crime-fighting applications with a primary focus on the knowledge discovery from databases (KDD) perspective. We identify and incorporate in the framework six classes of ISI technologies: information sharing and collaboration, crime association mining, crime classification and clustering, intelligence text mining, spatial and temporal analysis of crime patterns, and criminal network analysis. We also present a set of COPLINK case studies, ranging from detection of criminal identity deception to intelligent web portals for monitoring terrorist web sites, demonstrating the potential of ISI technologies in contributing to the critical missions of national security.

As this new ISI discipline continues to evolve and advance, several important directions need to be pursued, including technology development, testbed creation, and social, organizational, and policy studies.

- New technologies need to be developed and many existing information technologies should be re-examined and adapted for national security applications. The knowledge discovery perspective provides a promising direction. However, new technologies should be developed in a legal and ethical framework without compromising the privacy or civil liberties of citizens.
- Large-scale, non-sensitive data testbeds consisting of data from diverse, authoritative, and open sources and in different formats should be created and made available to the ISI research community. Lack of real research data has been a long-standing problem in intelligence- and security-related research. Many researchers are forced to use simulated or synthetic data that may not resemble true crime data characteristics. Furthermore, comparing competing technical approaches has been difficult because of the lack of standard testing collections. A comprehensive and non-sensitive open source data collection, analogous to the MUC (Message Understanding Conference) collection, will be of great value for ISI researchers to experiment with, test, and evaluate various technologies, and to compare and share findings, insights, and knowledge. Advanced methods may need to be employed to scrub data contained in the non-open source testbed to ensure data confidentiality while preserving its characteristics and underlying structures.
- The ultimate goal of ISI research is to enhance our national security. However, the question of how this type of research has impacted and will impact society, organizations, and the general public remains

unanswered. Researchers from social sciences, political sciences, organizational and management sciences, psychology, and education may contribute substantially to this aspect.

We hope active ISI research will help improve knowledge discovery and dissemination and enhance information sharing and collaboration among academics, local, state, and federal agencies, and industry, thereby bringing positive impacts to all aspects of our society.