

## Tracking And Data Fusion A Handbook Of Algorithms By

"Sensor and Data Fusion for Intelligent Transportation Systems introduces readers to the roles of the data fusion processes defined by the Joint Directors of Laboratories (JDL) data fusion model, data fusion algorithms, and noteworthy applications of data fusion to ITS. Additionally, the monograph offers detailed descriptions of three of the widely applied data fusion techniques and their relevance to ITS (namely, Bayesian inference, Dempster-Shafer evidential reasoning, and Kalman filtering), and indicates directions for future research in the area of data fusion. The focus is on data fusion algorithms rather than on sensor and data fusion architectures, although the book does summarize factors that influence the selection of a fusion architecture and several architecture frameworks"--

Sensor Fusion - Foundation and Applications comprehensively covers the foundation and applications of sensor fusion. This book provides some novel ideas, theories, and solutions related to the research areas in the field of sensor fusion. The book explores some of the latest practices and research works in the area of sensor fusion. The book contains chapters with different methods of sensor fusion for different engineering as well as non-engineering applications. Advanced applications of sensor fusion in the areas of mobile robots, automatic vehicles, airborne threats, agriculture, medical field and intrusion detection are covered in this book. Sufficient evidences and analyses have been provided in the chapter to show the effectiveness of sensor fusion in various applications. This book would serve as an invaluable reference for professionals involved in various applications of sensor fusion.

This textbook provides a comprehensive introduction to the concepts and idea of multisensor data fusion. It is an extensively revised second edition of the author's successful book: "Multi-Sensor Data Fusion: An Introduction" which was originally published by Springer-Verlag in 2007. The main changes in the new book are: New Material: Apart from one new chapter there are approximately 30 new sections, 50 new examples and 100 new references. At the same time, material which is out-of-date has been eliminated and the remaining text has been rewritten for added clarity. Altogether, the new book is nearly 70 pages longer than the original book. Matlab code: Where appropriate we have given details of Matlab code which may be downloaded from the worldwide web. In a few places, where such code is not readily available, we have included Matlab code in the body of the text. Layout. The layout and typography has been revised. Examples and Matlab code now appear on a gray background for easy identification and advanced material is marked with an asterisk. The book is intended to be self-contained. No previous knowledge of multi-sensor data fusion is assumed, although some familiarity with the basic tools of linear algebra, calculus and simple probability is recommended. Although conceptually simple, the study of multi-sensor data fusion presents challenges that are unique

within the education of the electrical engineer or computer scientist. To become competent in the field the student must become familiar with tools taken from a wide range of diverse subjects including: neural networks, signal processing, statistical estimation, tracking algorithms, computer vision and control theory. All too often, the student views multi-sensor data fusion as a miscellaneous assortment of different processes which bear no relationship to each other. In contrast, in this book the processes are unified by using a common statistical framework. As a consequence, the underlying pattern of relationships that exists between the different methodologies is made evident. The book is illustrated with many real-life examples taken from a diverse range of applications and contains an extensive list of modern references.

In the years since the bestselling first edition, fusion research and applications have adapted to service-oriented architectures and pushed the boundaries of situational modeling in human behavior, expanding into fields such as chemical and biological sensing, crisis management, and intelligent buildings. Handbook of Multisensor Data Fusion: Theory and Practice, Second Edition represents the most current concepts and theory as information fusion expands into the realm of network-centric architectures. It reflects new developments in distributed and detection fusion, situation and impact awareness in complex applications, and human cognitive concepts. With contributions from the world's leading fusion experts, this second edition expands to 31 chapters covering the fundamental theory and cutting-edge developments that are driving this field. New to the Second Edition—

- Applications in electromagnetic systems and chemical and biological sensors
- Army command and combat identification techniques
- Techniques for automated reasoning
- Advances in Kalman filtering
- Fusion in a network centric environment
- Service-oriented architecture concepts
- Intelligent agents for improved decision making
- Commercial off-the-shelf (COTS) software tools

From basic information to state-of-the-art theories, this second edition continues to be a unique, comprehensive, and up-to-date resource for data fusion systems designers.

Data fusion, the ability to combine data derived from several sources to provide a coherent, informative, and useful characterization of a situation, is a challenging task. There is no unified and proven solution which is applicable in all circumstances, but there are many plausible and useful approaches which can be and are used to solve particular applications. This volume presents the proceedings of the workshop Data Fusion Applications hosted in Brussels by the 1992 ESPRIT Conference and Exhibition. It contains 22 papers from 69 experts, who present advanced research results on data fusion together with practical solutions to multisensor data fusion in a wide variety of applications: real-time expert systems, robotics, medical diagnosis and patient surveillance, monitoring and control, marine protection, surveillance and safety in public transportation systems, image processing and interpretation, and environmental monitoring. The research forms part of the ESPRIT project DIMUS (Data Integration in Multisensor Systems).

A unique guide to the state of the art of tracking, classification, and sensor management This book addresses the tremendous progress made over the last few decades in algorithm development and mathematical analysis for filtering, multi-target multi-sensor tracking, sensor management and control, and target classification. It provides for the first time an integrated treatment of these advanced topics, complete with careful mathematical formulation, clear description of the theory, and real-world applications. Written by experts in the field, Integrated Tracking, Classification, and Sensor Management provides readers with easy access to key Bayesian modeling and filtering methods, multi-target tracking approaches, target classification procedures, and large scale sensor management problem-solving techniques. Features include: An accessible coverage of random finite set based multi-target filtering algorithms such as the Probability Hypothesis Density filters and multi-Bernoulli filters with focus on problem solving A succinct overview of the track-oriented MHT that comprehensively collates all significant developments in filtering and tracking A state-of-the-art algorithm for hybrid Bayesian network (BN) inference that is efficient and scalable for complex classification models New structural results in stochastic sensor scheduling and algorithms for dynamic sensor scheduling and management Coverage of the posterior Cramer-Rao lower bound (PCRLB) for target tracking and sensor management Insight into cutting-edge military and civilian applications, including intelligence, surveillance, and reconnaissance (ISR) With its emphasis on the latest research results, Integrated Tracking, Classification, and Sensor Management is an invaluable guide for researchers and practitioners in statistical signal processing, radar systems, operations research, and control theory.

Data fusion or information fusion are names which have been primarily assigned to military-oriented problems. In military applications, typical data fusion problems are: multisensor, multitarget detection, object identification, tracking, threat assessment, mission assessment and mission planning, among many others. However, it is clear that the basic underlying concepts underlying such fusion procedures can often be used in nonmilitary applications as well. The purpose of this book is twofold: First, to point out present gaps in the way data fusion problems are conceptually treated. Second, to address this issue by exhibiting mathematical tools which treat combination of evidence in the presence of uncertainty in a more systematic and comprehensive way. These techniques are based essentially on two novel ideas relating to probability theory: the newly developed fields of random set theory and conditional and relational event algebra. This volume is intended to be both an update on research progress on data fusion and an introduction to potentially powerful new techniques: fuzzy logic, random set theory, and conditional and relational event algebra. Audience: This volume can be used as a reference book for researchers and practitioners in data fusion or expert systems theory, or for graduate students as text for a research seminar or graduate level course.

With the recent proliferation of service-oriented architectures (SOA), cloud computing technologies, and distributed-interconnected systems, distributed fusion is taking on a larger role in a variety of applications—from environmental monitoring and crisis management to intelligent buildings and defense. Drawing on the work of leading experts around the world, *Distributed Data Fusion for Network-Centric Operations* examines the state of the art of data fusion in a distributed sensing, communications, and computing environment. Get Insight into Designing and Implementing Data Fusion in a Distributed Network Addressing the entirety of information fusion, the contributors cover everything from signal and image processing, through estimation, to situation awareness. In particular, the work offers a timely look at the issues and solutions involving fusion within a distributed network enterprise. These include critical design problems, such as how to maintain a pedigree of agents or nodes that receive information, provide their contribution to the dataset, and pass to other network components. The book also tackles dynamic data sharing within a network-centric enterprise, distributed fusion effects on state estimation, graph-theoretic methods to optimize fusion performance, human engineering factors, and computer ontologies for higher levels of situation assessment. A comprehensive introduction to this emerging field and its challenges, the book explores how data fusion can be used within grid, distributed, and cloud computing architectures. Bringing together both theoretical and applied research perspectives, this is a valuable reference for fusion researchers and practitioners. It offers guidance and insight for those working on the complex issues of designing and implementing distributed, decentralized information fusion.

Using MATLAB® examples wherever possible, *Multi-Sensor Data Fusion with MATLAB* explores the three levels of multi-sensor data fusion (MSDF): kinematic-level fusion, including the theory of DF; fuzzy logic and decision fusion; and pixel- and feature-level image fusion. The authors elucidate DF strategies, algorithms, and performance evaluation mainly for aerospace applications, although the methods can also be applied to systems in other areas, such as biomedicine, military defense, and environmental engineering. After presenting several useful strategies and algorithms for DF and tracking performance, the book evaluates DF algorithms, software, and systems. It next covers fuzzy logic, fuzzy sets and their properties, fuzzy logic operators, fuzzy propositions/rule-based systems, an inference engine, and defuzzification methods. It develops a new MATLAB graphical user interface for evaluating fuzzy implication functions, before using fuzzy logic to estimate the unknown states of a dynamic system by processing sensor data. The book then employs principal component analysis, spatial frequency, and wavelet-based image fusion algorithms for the fusion of image data from sensors. It also presents procedures for combining tracks obtained from imaging sensor and ground-based radar. The final chapters discuss how DF is applied to mobile intelligent autonomous systems and intelligent monitoring systems. Fusing sensors' data can lead to numerous benefits in a system's performance. Through real-world examples and the evaluation of algorithmic results, this detailed book provides an understanding of MSDF concepts and methods from a practical point of view. Select MATLAB programs are available for download on [www.crcpress.com](http://www.crcpress.com)

The science associated with the development of artificial sensory systems is occupied primarily with determining how information about the world can be extracted from sensory data. For example, computational vision is, for the most part, concerned with the development of algorithms for distilling information about the world and recognition of various objects in the environment (e. g. localization) from visual images (e. g. photographs or video frames). There are often a multitude of ways in which a specific piece of information about the world can be obtained from sensory data. A subarea of research into sensory systems has arisen which is concerned with methods for combining these various information sources. This field is known as data fusion, or sensor fusion. The literature on data fusion is extensive, indicating the intense interest in this topic, but is quite chaotic. There are no accepted approaches, save for a few special cases, and many of the best

methods are ad hoc. This book represents our attempt at providing a mathematical foundation upon which data fusion algorithms can be constructed and analyzed. The methodology that we present in this text is motivated by a strong belief in the importance of constraints in sensory information processing systems. In our view, data fusion is best understood as the embedding of multiple constraints on the solution to a sensory information processing problem into the solution process.

The essential guide to state-of-the-art mobile positioning and tracking techniques—fully updated for new and emerging trends in the field Mobile Positioning and Tracking, Second Edition explores state-of-the-art mobile positioning solutions applied on top of current wireless communication networks. Application areas covered include positioning, data fusion and filtering, tracking, error mitigation, both conventional and cooperative positioning technologies and systems, and more. The authors fill the gap between positioning and communication systems, showing how features of wireless communications systems can be used for positioning purposes and how the retrieved location information can be used to enhance the performance of wireless networks. Unlike other books on the subject, Mobile Positioning and Tracking: From Conventional to Cooperative Techniques, 2nd Edition covers the entire positioning and tracking value chain, starting from the measurement of positioning signals, and offering valuable insights into the theoretical fundamentals behind these methods and how they relate to application areas such as location-based services, as well as related disciplines and professional concerns, including global business considerations and the changing laws and standards governing wireless communication networks. Fully updated and revised for the latest developments in the field, this Second Edition: Features new chapters on UWB positioning and tracking, indoor positioning in WLAN, and multi-tag positioning in RFID Explores an array of positioning and tracking systems based on satellite and terrestrial systems technologies and methods Introduces advanced and novel topics such as localisation in heterogeneous and cooperative scenarios Provides a bridge between research and industry with potential implementations of the solutions presented Mobile positioning and tracking is subject to continuous innovations and improvements. This important working resource helps busy industry professionals and practitioners—including software and service developers—stay on top of emerging trends in the field. It is also a valuable reference for advanced students in related disciplines studying positioning and mobile technologies.

Tracking and Data Fusion A Handbook of Algorithms Tracking and Sensor Data Fusion Methodological Framework and Selected Applications Springer Science & Business Media

For some time, all branches of the military have used a wide range of sensors to provide data for many purposes, including surveillance, reconnoitring, target detection and battle damage assessment. Many nations have also attempted to utilise these sensors for civilian applications, such as crop monitoring, agricultural disease tracking, environmental diagnostics, cartography, ocean temperature profiling, urban planning, and the characterisation of the Ozone Hole above Antarctica. The recent convergence of several important technologies has made possible new, advanced, high performance, sensor based applications relying on the near-simultaneous fusion of data from an ensemble of different types of sensors. The book examines the underlying principles of sensor operation and data fusion, the techniques and technologies that enable the process, including the operation of 'fusion engines'. Fundamental theory and the enabling technologies of data fusion are presented in a systematic and accessible manner. Applications are discussed in the areas of medicine, meteorology, BDA and targeting, transportation, cartography, the environment, agriculture, and manufacturing and process control.

This book aims to explore the latest practices and research works in the area of sensor fusion. The book intends to provide a collection of novel ideas, theories, and solutions related to the research areas in the field of sensor fusion. This book is a unique, comprehensive, and up-

to-date resource for sensor fusion systems designers. This book is appropriate for use as an upper division undergraduate or graduate level text book. It should also be of interest to researchers, who need to process and interpret the sensor data in most scientific and engineering fields. The initial chapters in this book provide a general overview of sensor fusion. The later chapters focus mostly on the applications of sensor fusion. Much of this work has been published in refereed journals and conference proceedings and these papers have been modified and edited for content and style. With contributions from the world's leading fusion researchers and academicians, this book has 22 chapters covering the fundamental theory and cutting-edge developments that are driving this field.

Combining versatile data sets from multiple satellite sensors with advanced thematic information retrieval is a powerful way for studying complex earth systems. The book *Multisensor Data Fusion and Machine Learning for Environmental Remote Sensing* offers complete understanding of the basic scientific principles needed to perform image processing, gap filling, data merging, data fusion, machine learning, and feature extraction. Written by two experts in remote sensing, the book presents the required basic concepts, tools, algorithms, platforms, and technology hubs toward advanced integration. By merging and fusing data sets collected from different satellite sensors with common features, we are enabled to utilize the strength of each satellite sensor to the maximum extent. The inclusion of machine learning or data mining techniques to aid in feature extraction after gap filling, data merging and/or data fusion further empowers earth observation, leading to confirm the whole is greater than the sum of its parts. Contemporary applications discussed in this book make all essential knowledge seamlessly integrated by an interdisciplinary manner. These case-based engineering practices uniquely illustrate how to improve such an emerging field of importance to cope with the most challenging real-world environmental monitoring issues.

*Data Fusion Methodology and Applications* explores the data-driven discovery paradigm in science and the need to handle large amounts of diverse data. Drivers of this change include the increased availability and accessibility of hyphenated analytical platforms, imaging techniques, the explosion of omics data, and the development of information technology. As data-driven research deals with an inductive attitude that aims to extract information and build models capable of inferring the underlying phenomena from the data itself, this book explores the challenges and methodologies used to integrate data from multiple sources, analytical platforms, different modalities, and varying timescales. Presents the first comprehensive textbook on data fusion, focusing on all aspects of data-driven discovery Includes comprehensible, theoretical chapters written for large and diverse audiences Provides a wealth of selected application to the topics included

This textbook provides a comprehensive introduction to the theories and techniques of multi-sensor data fusion. It is aimed at advanced undergraduate and first-year graduate students in electrical engineering and computer science, as well as researchers and professional engineers. The book is intended to be self-contained. No previous knowledge of

multi-sensor data fusion is assumed, although some familiarity with the basic tools of linear algebra, calculus and simple probability theory is recommended.

This book illustrates the benefits of sensor fusion by considering the characteristics of infrared, microwave, and millimeter-wave sensors, including the influence of the atmosphere on their performance. Applications that benefit from this technology include: vehicular traffic management, remote sensing, target classification and tracking- weather forecasting- military and homeland defense. Covering data fusion algorithms in detail, Klein includes a summary of the information required to implement each of the algorithms discussed, and outlines system application scenarios that may limit sensor size but that require high resolution data.

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Sensor Data Fusion is the process of combining incomplete and imperfect pieces of mutually complementary sensor information in such a way that a better understanding of an underlying real-world phenomenon is achieved. Typically, this insight is either unobtainable otherwise or a fusion result exceeds what can be produced from a single sensor output in accuracy, reliability, or cost. This book provides an introduction Sensor Data Fusion, as an information technology as well as a branch of engineering science and informatics. Part I presents a coherent methodological framework, thus providing the prerequisites for discussing selected applications in Part II of the book. The presentation mirrors the author's views on the subject and emphasizes his own contributions to the development of particular aspects. With some delay, Sensor Data Fusion is likely to develop along lines similar to the evolution of another modern key technology whose origin is in the military domain, the Internet. It is the author's firm conviction that until now, scientists and engineers have only scratched the surface of the vast range of opportunities for research, engineering, and product development that still waits to be explored: the Internet of the Sensors.

Data Fusion is a very broad interdisciplinary technology domain. It provides techniques and methods for; integrating information from multiple sources and using the complementarities of these detections to derive maximum information about the phenomenon being observed; analyzing and deriving the meaning of these observations and predicting possible consequences of the observed state of the environment; selecting the best course of action; and controlling the actions. Here, the focus is on the more mature phase of data fusion, namely the detection and identification / classification of phenomena being observed and exploitation of the related methods for Security-Related Civil Science and Technology (SST) applications. It is necessary to; expand on the data fusion methodology pertinent to Situation Monitoring, Incident Detection, Alert and Response Management; discuss some related Cognitive Engineering and visualization issues; provide an insight into the architectures and methodologies for building a data fusion system;

discuss fusion approaches to image exploitation with emphasis on security applications; discuss novel distributed tracking approaches as a necessary step of situation monitoring and incident detection; and provide examples of real situations, in which data fusion can enhance incident detection, prevention and response capability. In order to give a logical presentation of the data fusion material, first the general concepts are highlighted (Fusion Methodology, Human Computer Interactions and Systems and Architectures), closing with several applications (Data Fusion for Imagery, Tracking and Sensor Fusion and Applications and Opportunities for Fusion).

Here's a thorough overview of the state-of-the-art in design and implementation of advanced tracking for single and multiple sensor systems. This practical resource provides modern system designers and analysts with in-depth evaluations of sensor management, kinematic and attribute data processing, data association, situation assessment, and modern tracking and data fusion methods as applied in both military and non-military arenas.

Multisensor Data Fusion: From Algorithms and Architectural Design to Applications covers the contemporary theory and practice of multisensor data fusion, from fundamental concepts to cutting-edge techniques drawn from a broad array of disciplines. Featuring contributions from the world's leading data fusion researchers and academicians, this authoritative book: Presents state-of-the-art advances in the design of multisensor data fusion algorithms, addressing issues related to the nature, location, and computational ability of the sensors Describes new materials and achievements in optimal fusion and multisensor filters Discusses the advantages and challenges associated with multisensor data fusion, from extended spatial and temporal coverage to imperfection and diversity in sensor technologies Explores the topology, communication structure, computational resources, fusion level, goals, and optimization of multisensor data fusion system architectures Showcases applications of multisensor data fusion in fields such as medicine, transportation's traffic, defense, and navigation Multisensor Data Fusion: From Algorithms and Architectural Design to Applications is a robust collection of modern multisensor data fusion methodologies. The book instills a deeper understanding of the basics of multisensor data fusion as well as a practical knowledge of the problems that can be faced during its execution. This book provides an introductory treatment of the fundamentals of decision-making in a distributed framework.

Classical detection theory assumes that complete observations are available at a central processor for decision-making. More recently, many applications have been identified in which observations are processed in a distributed manner and decisions are made at the distributed processors, or processed data (compressed observations) are conveyed to a fusion center that makes the global decision. Conventional detection theory has been extended so that it can deal with such distributed detection problems. A unified treatment of recent advances in this new branch of statistical decision theory is presented. Distributed detection under different formulations and for a variety of detection network topologies is



discussed. This material is not available in any other book and has appeared relatively recently in technical journals. The level of presentation is such that the book can be used as a graduate-level textbook. Numerous examples are presented throughout the book. It is assumed that the reader has been exposed to detection theory. The book will also serve as a useful reference for practicing engineers and researchers. I have actively pursued research on distributed detection and data fusion over the last decade, which ultimately interested me in writing this book. Many individuals have played a key role in the completion of this book.

Fills the Existing Gap of Mathematics for Data Fusion Data fusion (DF) combines large amounts of information from a variety of sources and fuses this data algorithmically, logically and, if required intelligently, using artificial intelligence (AI). Also, known as sensor data fusion (SDF), the DF fusion system is an important component for use in various applications that include the monitoring of vehicles, aerospace systems, large-scale structures, and large industrial automation plants. Data Fusion Mathematics: Theory and Practice offers a comprehensive overview of data fusion, and provides a proper and adequate understanding of the basic mathematics directly related to DF. The material covered can be used for evaluation of the performances of any designed and developed DF systems. It tries to answer whether unified data fusion mathematics can evolve from various disparate mathematical concepts, and highlights mathematics that can add credibility to the data fusion process. Focuses on Mathematical Tools That Use Data Fusion This text explores the use of statistical/probabilistic signal/image processing, filtering, component analysis, image algebra, decision making, and neuro-FL–GA paradigms in studying, developing and validating data fusion processes (DFP). It covers major mathematical expressions, and formulae and equations as well as, where feasible, their derivations. It also discusses SDF concepts, DF models and architectures, aspects and methods of type 1 and 2 fuzzy logics, and related practical applications. In addition, the author covers soft computing paradigms that are finding increasing applications in multisensory DF approaches and applications. This book: Explores the use of interval type 2 fuzzy logic and ANFIS in DF Covers the mathematical treatment of many types of filtering algorithms, target-tracking methods, and kinematic DF methods Presents single and multi-sensor tracking and fusion mathematics Considers specific DF architectures in the context of decentralized systems Discusses information filtering, Bayesian approaches, several DF rules, image algebra and image fusion, decision fusion, and wireless sensor network (WSN) multimodality fusion Data Fusion Mathematics: Theory and Practice incorporates concepts, processes, methods, and approaches in data fusion that can help you with integrating DF mathematics and achieving higher levels of fusion activity, and clarity of performance. This text is geared toward researchers, scientists, teachers and practicing engineers interested and working in the multisensor data fusion area. Expert coverage of the design and implementation of stateestimation algorithms for tracking and navigation Estimation

with Applications to Tracking and Navigation treats the estimation of various quantities from inherently inaccurate remote observations. It explains state estimator design using a balanced combination of linear systems, probability, and statistics. The authors provide a review of the necessary background mathematical techniques and offer an overview of the basic concepts in estimation. They then provide detailed treatments of all the major issues in estimation with a focus on applying these techniques to real systems. Other features include: Problems that apply theoretical material to real-world applications In-depth coverage of the Interacting Multiple Model (IMM) estimator Companion DynaEst(TM) software for MATLAB(TM) implementation of Kalman filters and IMM estimators Design guidelines for tracking filters Suitable for graduate engineering students and engineers working in remote sensors and tracking, Estimation with Applications to Tracking and Navigation provides expert coverage of this important area.

The emerging technology of multisensor data fusion has a wide range of applications, both in Department of Defense (DoD) areas and in the civilian arena. The techniques of multisensor data fusion draw from an equally broad range of disciplines, including artificial intelligence, pattern recognition, and statistical estimation. With the rapid evolution Since the publication of the first edition of this book, advances in algorithms, logic and software tools have transformed the field of data fusion. The latest edition covers these areas as well as smart agents, human computer interaction, cognitive aides to analysis and data system fusion control. data fusion system, this book guides you through the process of determining the trade-offs among competing data fusion algorithms, selecting commercial off-the-shelf (COTS) tools, and understanding when data fusion improves systems processing. Completely new chapters in this second edition explain data fusion system control, DARPA's recently developed TRIP model, and the latest applications of data fusion in data warehousing and medical equipment, as well as defence systems.

The book explores object and situation fusion processes with an appropriate handling of uncertainties, and applies cutting-edge artificial intelligence and emerging technologies like particle filtering, spatiotemporal clustering, net-centricity, agent formalism, and distributed fusion together with essential Level 1 techniques and Level 1/2 interactions. An introduction to data fusion which employs both new and traditional communication and information theory, pattern recognition, image understanding, estimation theory, digital signal processing and artificial intelligence.

The security of the U.S. commercial aviation system has been a growing concern since the 1970's when the hijacking of aircraft became a serious problem. Over that period, federal aviation officials have been searching for more effective ways for non-invasive screening of passengers, luggage, and cargo to detect concealed explosives and weapons. To assist in this effort, the Transportation Security Administration (TSA) asked the NRC for a study of emerging screening technologies. This book - the fourth of four - focuses on data fusion as a means to significantly improve the ability of the

existing suite of airport detection systems and access control systems to detect and prevent attacks. The book presents a discussion of the data fusion, an analysis of current data fusion efforts, and an assessment of data fusion opportunities for various airport security activities.

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