

N. Senthamilarasi, V. Subapriya, Nikitha

# Malware Analysis

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## Product Description

In today's interconnected digital landscape, the threat from malicious software is a constant and rapidly evolving challenge, capable of inflicting significant harm on individuals and organizations. MALWARE ANALYSIS is an essential guide crafted to provide a comprehensive foundation for cybersecurity specialization in both malware analysis and Operating System (OS) security. It is designed to equip students, security professionals, IT professionals, and researchers with the crucial tools and knowledge needed to identify, understand, and effectively neutralize threats in real-world environments.

The book's core value lies in its pragmatic approach, meticulously combining theoretical foundations with indispensable hands-on analysis techniques. Readers will gain an in-depth exploration of both static malware analysis (examining code without execution) and dynamic malware analysis (studying behavior during execution). The content systematically progresses from fundamental concepts of malware types—such as worms, ransomware, and rootkits—and their evolution to advanced analysis techniques. Key topics include setting up an isolated malware analysis lab, using powerful behavioral monitoring tools like Process Monitor and Wireshark, and advanced code-level debugging with tools like OLLYDBG. Furthermore, it covers advanced malware functionality like Process Injection and modern detection techniques, including signature-based, non-signature-based, and machine-learning methods. This text is an indispensable resource for mastering the skills required to safeguard digital infrastructure against emerging and complex cyber threats.

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Salient Features:

● Malware Taxonomy Deep Dive: Explores the fundamental concepts, history, and taxonomy of malicious software, including worms, ransomware, rootkits, spyware, and sophisticated Advanced Persistent Threats (APTs).

● Static Analysis Mastery: Provides thorough instruction on static analysis techniques, covering X86 architecture, the Portable Executable (PE) File Format, and essential concepts like Opcodes and Disassembly for code inspection.

● Dynamic Behavior Profiling: Details the principles of dynamic analysis, including setting up an isolated Malware Sandbox and utilizing key tools like Process Monitor and

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Wireshark to observe runtime behavior and network traffic.

● Practical Lab Setup: Guides the reader through assembling a complete malware analysis toolkit, covering virtualization, isolation techniques, and the use of behavioral monitoring and code-analysis utilities.

● Advanced Debugging Techniques: Teaches practical skills in advanced code-level analysis, including kernel vs. user-mode debugging, setting Breakpoints and Tracing execution, and using debuggers like OLLYDBG.

● Covert Malware Functionality: Discusses sophisticated attack vectors and persistence mechanisms, such as Process Injection, Privilege Escalation, Downloaders, and Credential Stealers.

● Detection & Evasion Tactics: Explores contemporary techniques like signature-based, similarity-based, and Machine Learning methods for detection, alongside malware evasion tactics such as Polymorphic and Metamorphic code.

● Integrated OS Security: Provides fundamental context by linking malware analysis directly to OS Security concepts, including principles like integrity, confidentiality, and availability, and various system threats.

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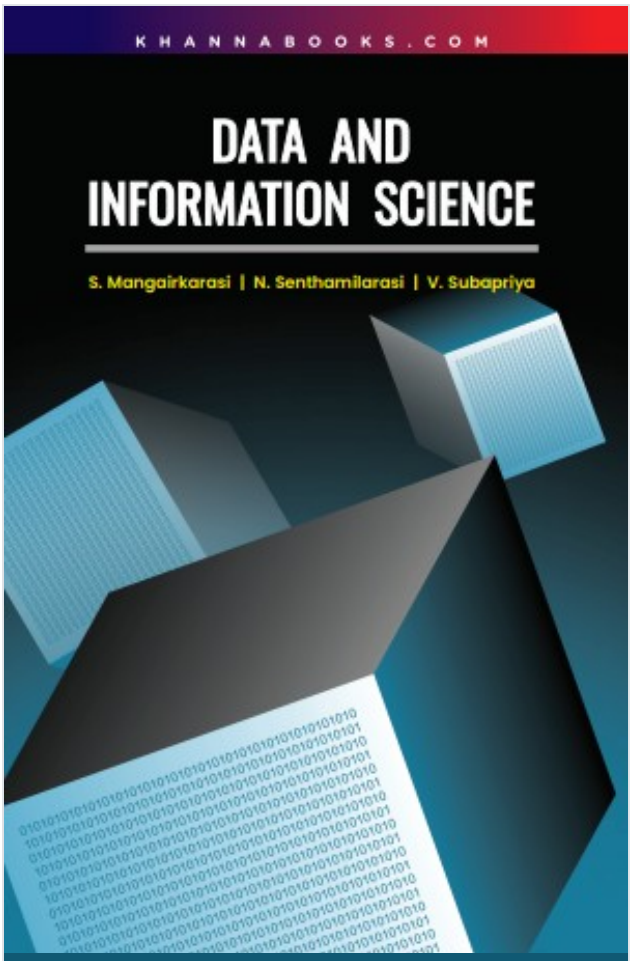


**S. Mangairkarasi, N. Senthamilarasi, V. Subapriya**

# Data and Information Science

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## Product Description

### Data and Information Science

This book provides a comprehensive and practical guide to the multidisciplinary fields of data science and information science. In an increasingly data-driven world, the text addresses the critical need to understand, manage, and extract actionable value from massive data sets in sectors ranging from business to government. It is an essential resource for students, professionals, and hobbyists seeking to master the techniques of this transformative domain. The book systematically explores the entire data lifecycle, from initial data acquisition, preprocessing, and cleaning to advanced subjects like Artificial Intelligence, Big Data Analytics, and Data Ethics.

It successfully bridges the gap between theoretical concepts and practical application by detailing key methodologies, essential tools of Business Intelligence (BI), and providing real-world insights. Readers will gain an in-depth understanding of how to combine computer science, statistics, and machine learning principles to detect patterns, predict outcomes, and drive superior decision-making. Ultimately, this material is designed to equip you with the critical skills needed to utilize data effectively, spur creativity, and confidently participate in the ongoing data-driven revolution.

**Salient Features:**

- **Full Data Lifecycle**: Presents a complete framework covering all steps of the data lifecycle, from acquisition sources (Web APIs, Relational Databases) to data processing and final analysis.
- **Practical Tool Focus**: Integrates practical tools and libraries like Pandas, NumPy, and Matplotlib for real-world data preparation and implementation in Machine Learning models.

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- **Data Quality Mastery**: Offers detailed strategies for improving data quality, including Data Wrangling, handling missing values, and utilizing Binning, Regression, and Clustering for noisy data.
- **Big Data Principles**: Introduces the fundamental concepts and challenges of Big Data (Volume, Variety, Velocity) and discusses effective strategies for processing and utilizing massive datasets.
- **Text Analysis Techniques**: Dedicated coverage of text-based data handling, exploring methods such as Bag of Words, Regular Expressions, and the practical application of Sentiment Analysis.
- **Visualization and BI**: Provides essential skills in data visualization basics, including creating compelling charts and dashboards using the leading Business Intelligence tool, Tableau.
- **Data Transformation Depth**: Explores the nuances of data transformation, detailing structural changes, normalization, discretization, and the difference between ETL and ELT processes.
- **Open Data Resources:** Highlights key sources for obtaining data, including internal/external systems, Cloud Data Warehouses, and open-source repositories like Kaggle and the UCI Machine Learning Repository.

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- Data Acquisition
- Data Processing and Preparation
- Data Quality and Transformation
- Handling Text Data
- Business Intelligence Strategy and Road Map


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