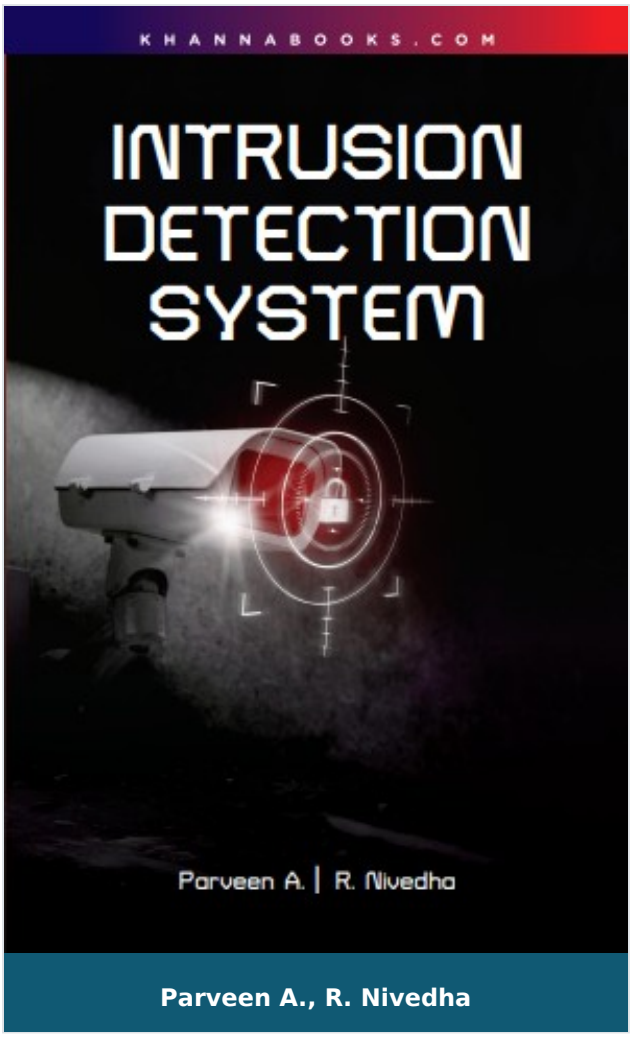


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Intrusion Detection Systems

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Product Description

Intrusion Detection Systems

"INTRUSION DETECTION SYSTEMS" offers a comprehensive and vital resource for navigating the rapidly evolving domain of cybersecurity. Written in an academic yet accessible tone, this book provides a thorough introduction to Intrusion Detection Systems (IDS), exploring their historical evolution, foundational concepts, and critical role in protecting modern digital environments. The core purpose of this text is to bridge the gap between theoretical knowledge and real-world application, equipping readers with the expertise to implement robust security strategies against increasingly sophisticated threats.

The book highlights the transformative impact of Machine Learning (ML) and Artificial Intelligence (AI) on IDS, detailing deep learning approaches, ML models for anomaly detection, and feature engineering techniques. It goes beyond traditional methods to address the unique challenges of securing emerging technologies such as the Internet of Things (IoT), cloud-based networks, and blockchain. Furthermore, it delves into advanced techniques like fuzzy logic, genetic algorithms, hybrid models, and real-time IDS using big data analytics.

This indispensable guide is meticulously structured with five units and includes detailed case studies, making it an essential text for its target audience: students seeking foundational knowledge, professionals looking to upgrade their deployment strategies, and researchers exploring open challenges like adversarial ML attacks and autonomous IDS development. It serves as a definitive roadmap for enhancing network resilience against the ever-changing cyber threat landscape.

Salient Features:

- **Core IDS Fundamentals**: Explore the history, evolution, and foundational principles of IDS. Compare signature-based, anomaly-based, and hybrid models, and understand key evaluation metrics like TPR and FPR.
- **AI-Driven Detection**: Master the use of Machine Learning and Deep Learning, including CNNs and LSTMs, to enhance anomaly detection capabilities and prepare large-scale datasets for modern IDS.
- **Securing New Frontiers:** Learn to design and implement specialized IDS for emerging technologies like IoT, cloud computing, and blockchain. Focus on lightweight solutions for resource-constrained mobile and edge environments.
- **Advanced Threat Mitigation**: Investigate cutting-edge techniques such as fuzzy logic and genetic algorithms in IDS. Understand hybrid models, distributed architectures, and real-time big data analytics for large-scale networks.
- **Future Resilience & Research**: Analyze emerging threats and explore future trends like autonomous and self-healing IDS. Study the defense against adversarial ML attacks and the strategic integration with SIEM systems.
- **Real-World Application**: Apply theoretical knowledge through five detailed case studies, including enterprise deployment, advanced financial institution solutions, and securing smart city infrastructure.
- **Defense Architecture**: Clearly differentiate between the passive monitoring role of Intrusion Detection Systems (IDS) and the proactive blocking function of Intrusion Prevention Systems (IPS) in modern security.

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- IDS for Emerging Technologies
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Smarter City

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Product Description

Smarter City

The concept of the Smarter City represents the future of urban living—a paradigm where technology, data, and interconnected infrastructure converge to enhance sustainability, efficiency, and the quality of life for citizens.

Smarter City provides an essential roadmap for understanding this complex evolution. It begins by laying the foundational pillars, exploring the convergence of IoT (Internet of Things), Cloud Computing, and Big Data as the technological engine of urban transformation. The book moves beyond theory to detail practical, real-world use cases, such as Connected Street Lighting that improves energy efficiency, Smart Traffic Control that dynamically reduces congestion, and Connected Environmental Monitoring systems that track air and water quality in real time.

This text is vital for urban planners, engineers, policymakers, and technologists seeking to grasp the architecture, implementation, and long-term impact of smart city initiatives. It is the definitive guide to building a truly intelligent, resilient, and sustainable urban future.

Salient Features:

- **Foundational Technology**: Deep dive into the core technologies enabling smart cities: IoT (Internet of Things), Cloud Computing, and Big Data Analytics.
- **Key Pillars of Smart Cities**: Comprehensive coverage of the main components, including Smart Governance, Smart Economy, Smart Mobility, Smart Environment, Smart People, and Smart Living.
- **IoT Architecture and Sensors**: Detailed explanation of the IoT architectural layers (Perception, Network, Application) and the role of various sensors (temperature,

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humidity, air quality) in data collection.

- **Practical Use Cases**: Real-world examples of successful smart city deployment, including:

1. Connected Street Lighting for energy saving and remote monitoring.
2. Smart Traffic Control for dynamic signal adjustment and congestion reduction.
3. Connected Environmental Monitoring for air quality tracking and pollution detection.

- **Cloud and Data Integration**: Analysis of how Cloud Platforms provide the necessary infrastructure for scalable data storage and how Big Data Analytics translates raw sensor data into actionable insights for city management.
- **Citizen-Centric Design**: Emphasis on how smart city initiatives directly benefit citizens by enhancing public safety, reducing commute times, and improving environmental sustainability.

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