



GOKHALE EDUCATION SOCIETY'S  
R. H. SAPAT COLLEGE OF ENGINEERING,  
MANAGEMENT STUDIES AND RESEARCH,  
NASHIK - 422 005, (M.S.), INDIA

SEMINAR ON,  
**EMERGING THREATS IN IOT SECURITY**

IN PARTIAL FULFILLMENT OF REQUIREMENTS FOR THE DEGREE THIRD YEAR COMPUTER  
ENGINEERING

By

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# Introduction

- Internet Of Things
- Layers of IoT Security
- Major Classes of IoT Security Solutions

- BLOCKCHAIN
- FOG COMPUTING
- MACHINE LEARNING
- EDGE COMPUTING





# Literature Survey

TITLE	AUTHOR	YEAR
Comprehensive Study on Security Issues in Internet of Things: A Survey Paper	Abhishek Vyas, Santeesh Abimannam	2018
A Survey on IoT Security: Application Areas, Security Threats, and Solution Architectures	Vinay Chamola	2019
Emerging Security Threats, Countermeasures, Issues, and Future Aspects on the Internet of Things (IoT): A Systematic Literature Review	Garima Verma, Shiv Prakash	2021

# Objective



- ① To create secure IoT security
- ① Enhance trustworthiness of IoT application
- To highlight the IoT security measures in rapidly growing IoT
- ① ecosystem and propose technology to address them

# Layers of IoT Security

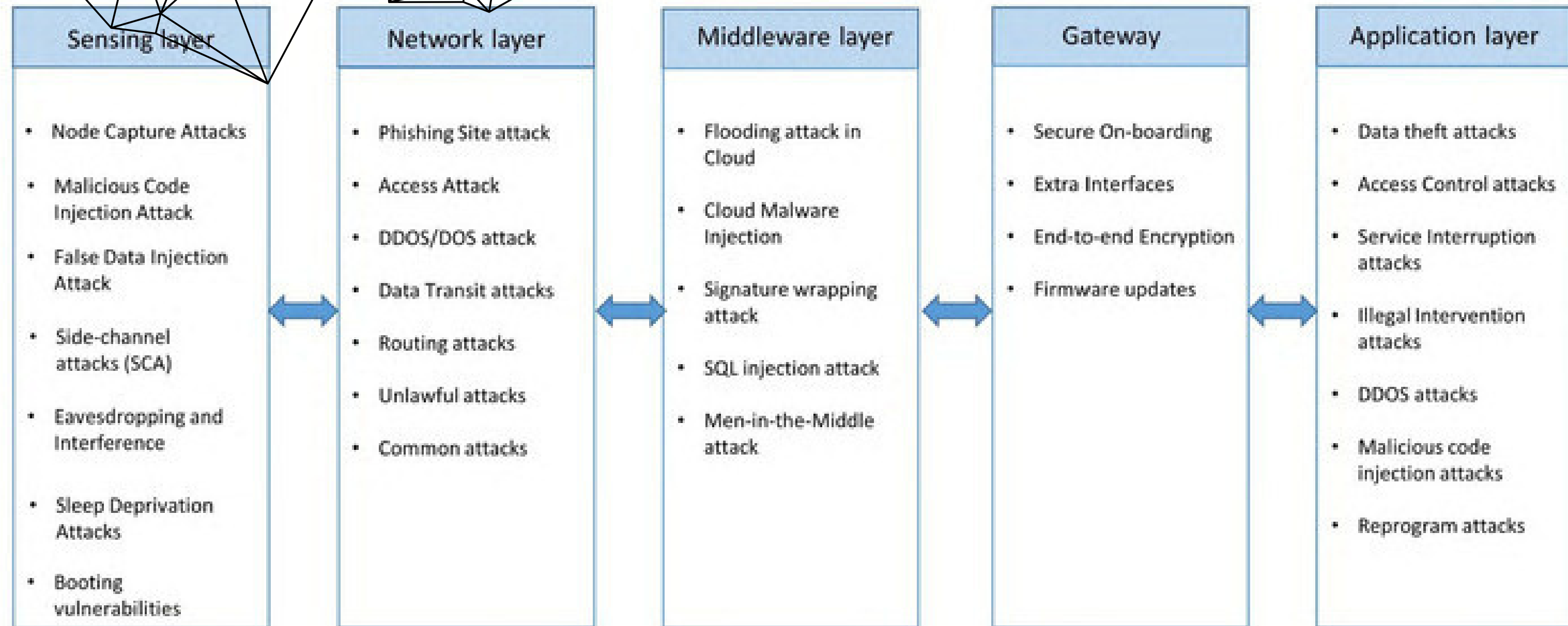


Image 1 - Layers of IoT Security

FIGURE 3. Types of attacks on IoT.

# Methodology

- Using Blockchain
- Using Fog Computing
- Using Machine Learning
- Using Edge Computing

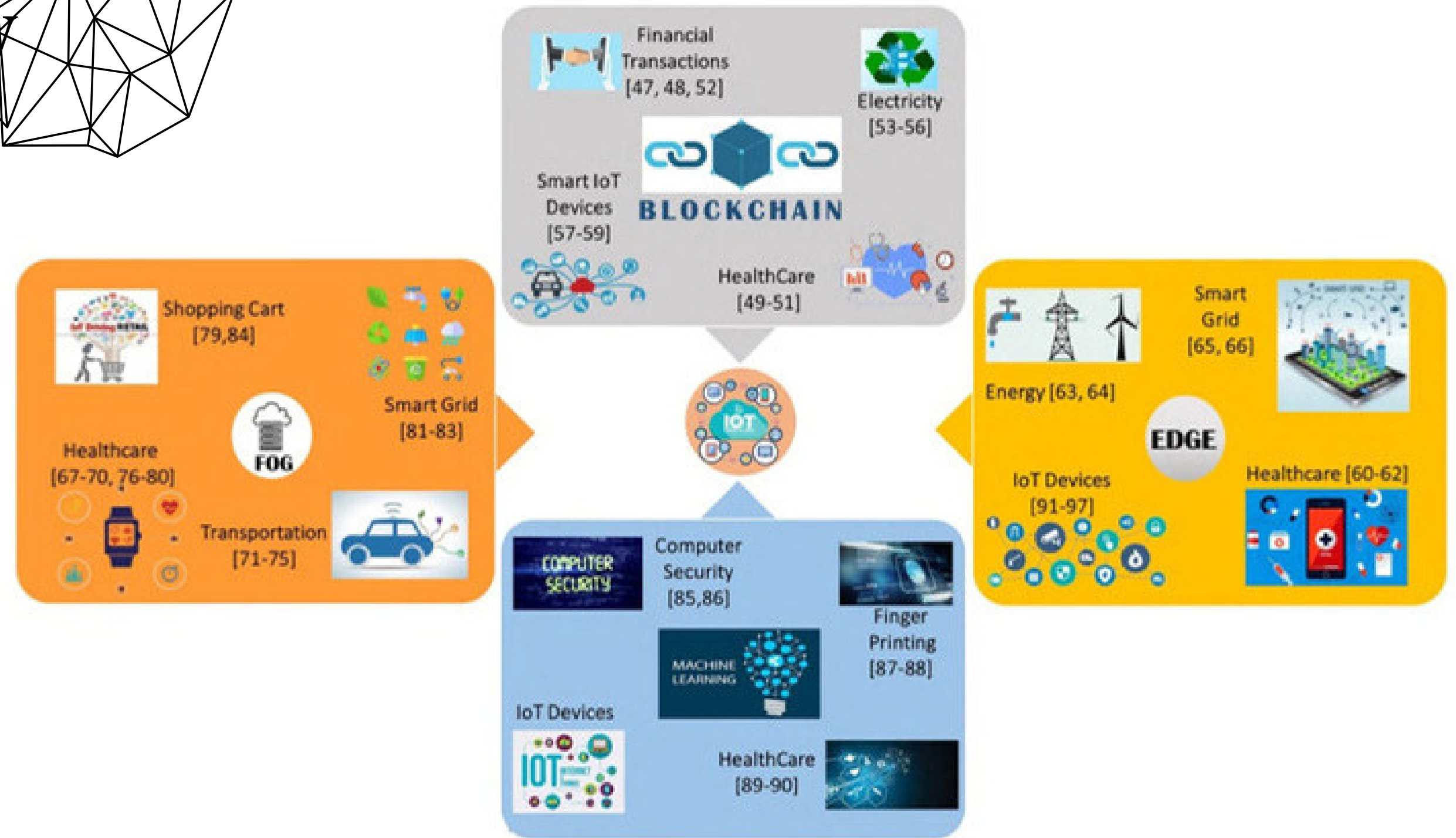
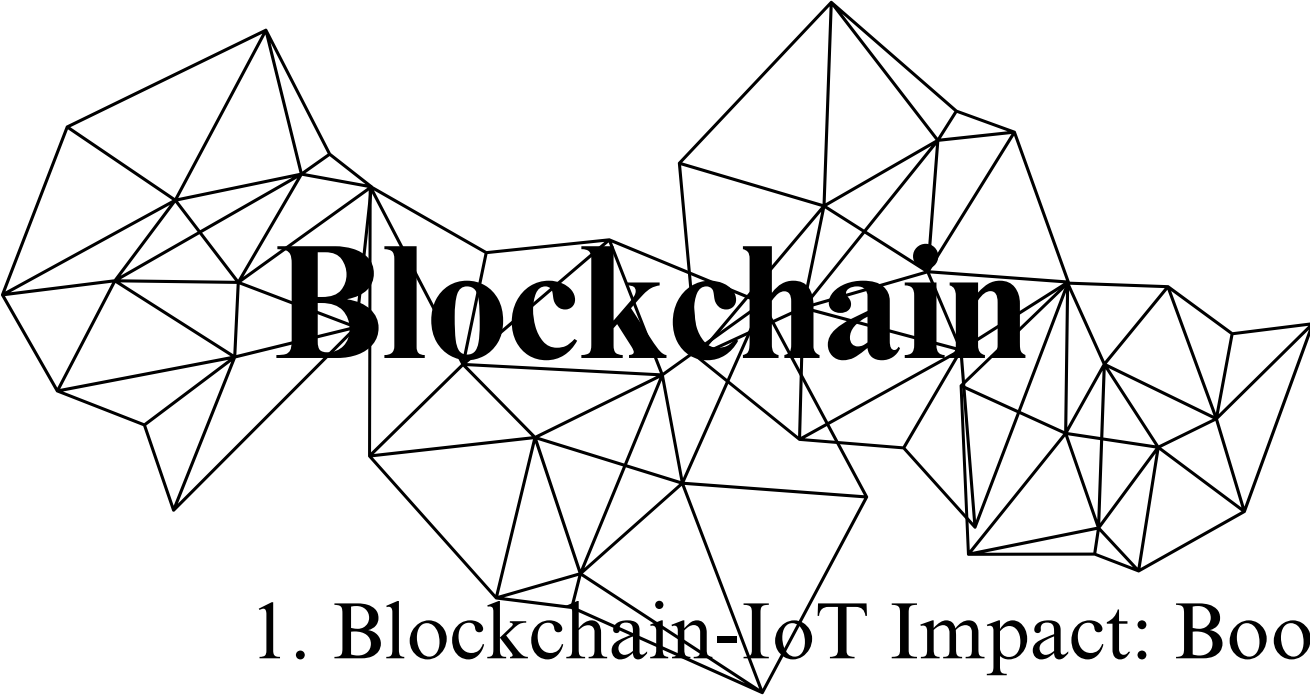
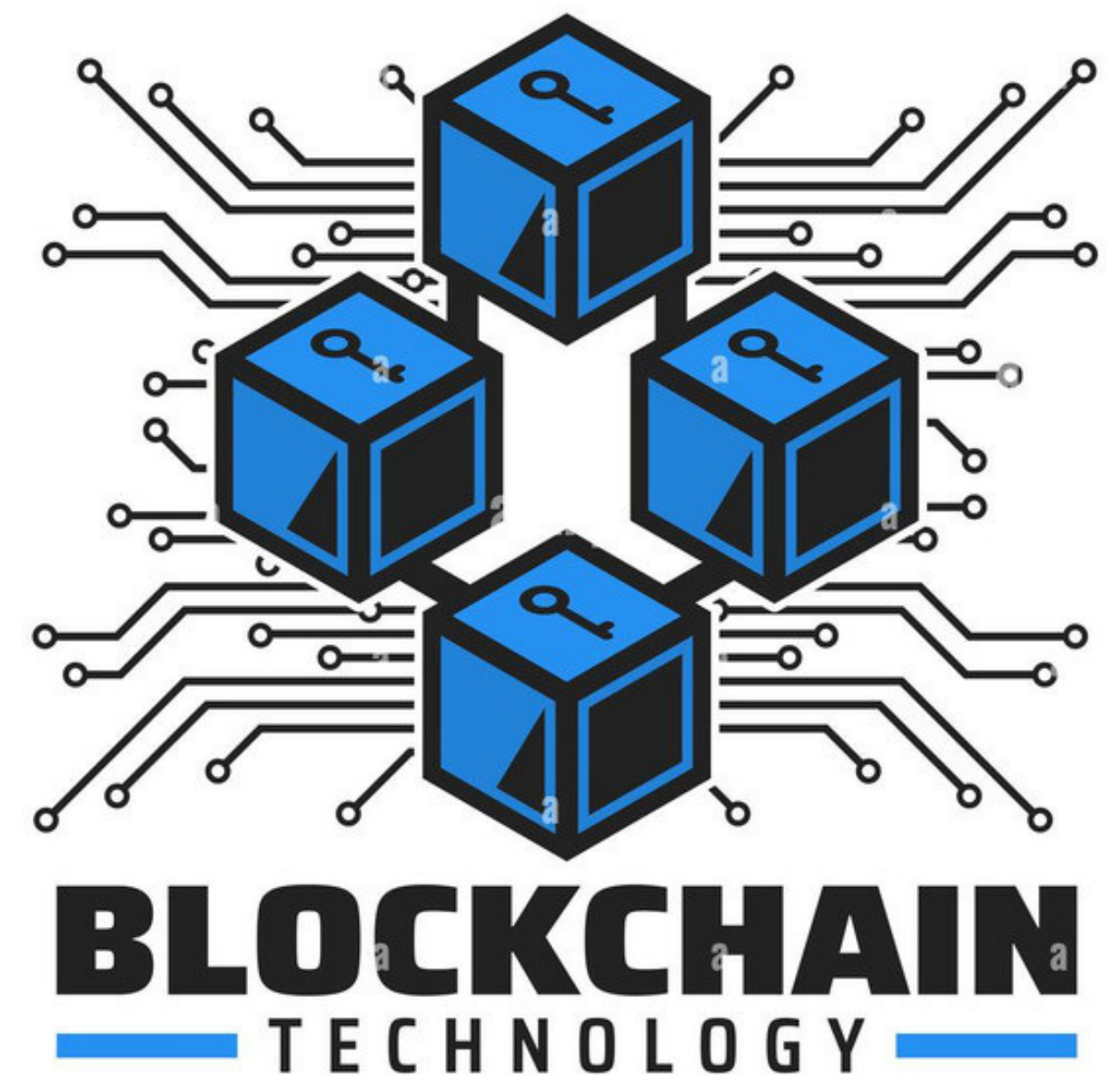


FIGURE 4. Research papers addressing IoT security using various security techniques.



1. Blockchain-IoT Impact: Boosts IT, trust, and transparency.
2. IoT Data: Real-time data from IoT sensors.
3. Data Security: Blockchain's decentralized security.
4. Blockchain Basics: Chronological ledger with hashes.
5. Root Hash Verification: Ensures transaction integrity.
6. Miner Role: Anonymously validate transactions.
7. Blockchain for IoT: Tamper-proof data storage.
8. Transaction Flow: Process from initiation to commitment.
9. Blockchain Platforms: Ethereum, Hyperledger, Ripple, etc.





# Process of Blockchain

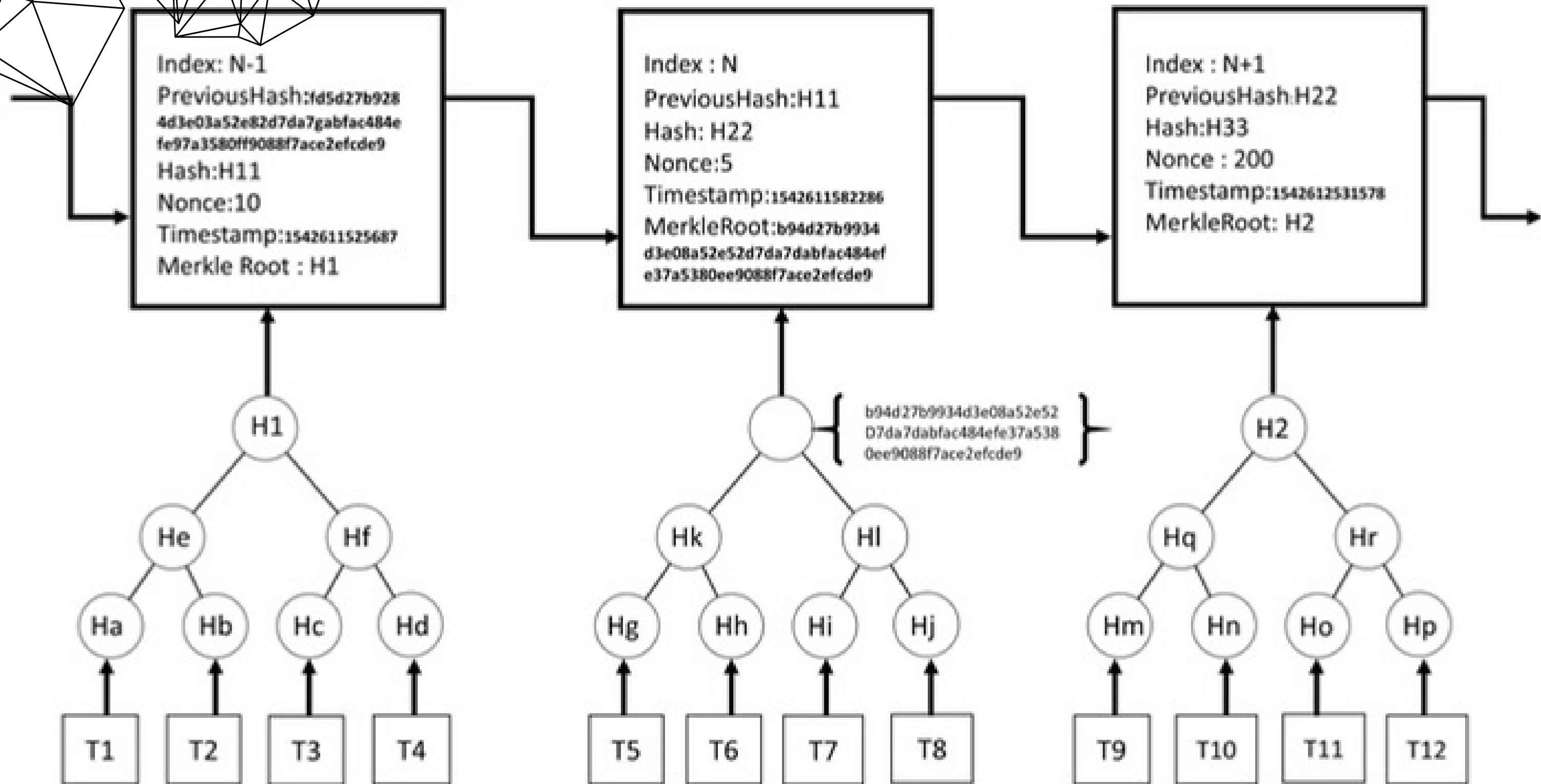
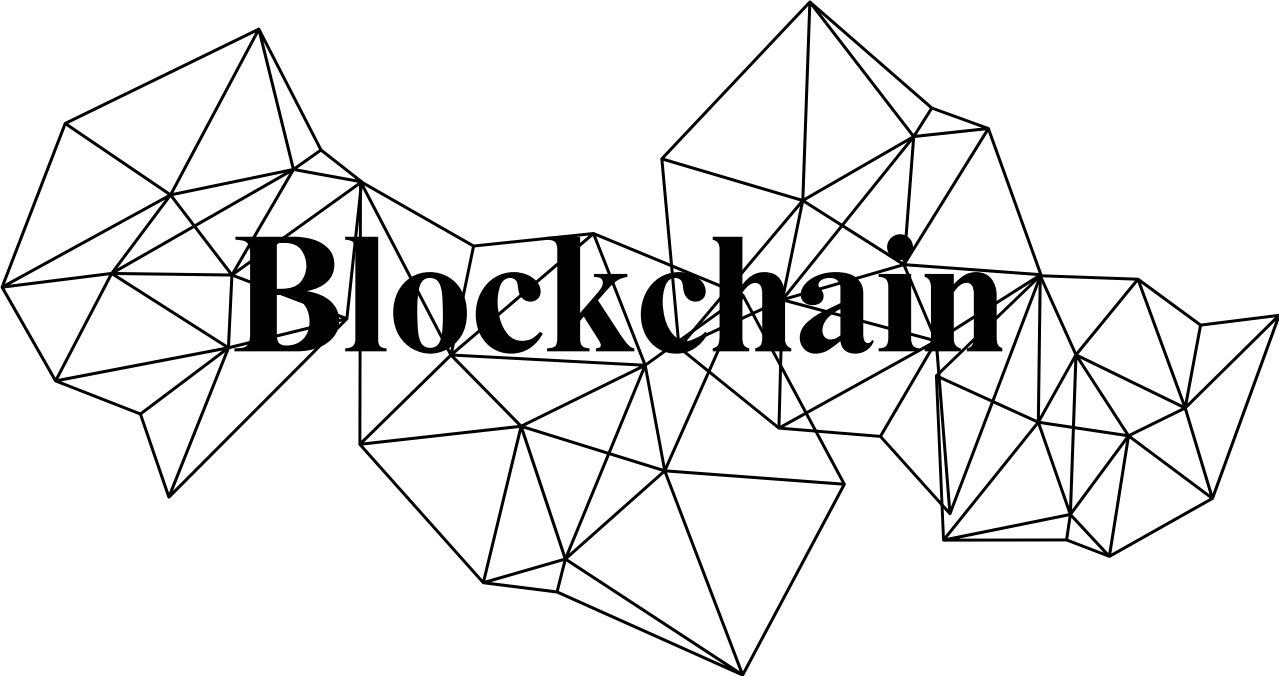


FIGURE 6. Basic blockchain architecture.



## Advantages

Enhanced Data Security

Decentralized Trust

Automated Access Control

Supply Chain Security

Secure Device Identity

## Disadvantages

Scalability Challenges

Latency and Speed

Regulatory Uncertainty

Resource Intensive

Cost



# APPLICATIONS OF BLOCKCHAIN IN IoT

- Ensures data integrity and immutability.
- Provides secure device identities and access control.
- Validates supply chain authenticity.
- Secures firmware updates distribution.
- Enables safe data sharing and audit trails.
- Enhances DDoS resilience and privacy.
- Establishes trust between devices.

# Challenges

1. Blockchain security depends on implementation and hardware.

Public transactions raise privacy concerns.

2. Growing miners increase blockchain size, impacting storage costs, and network speed, causing scalability and availability issues.

# Future Research

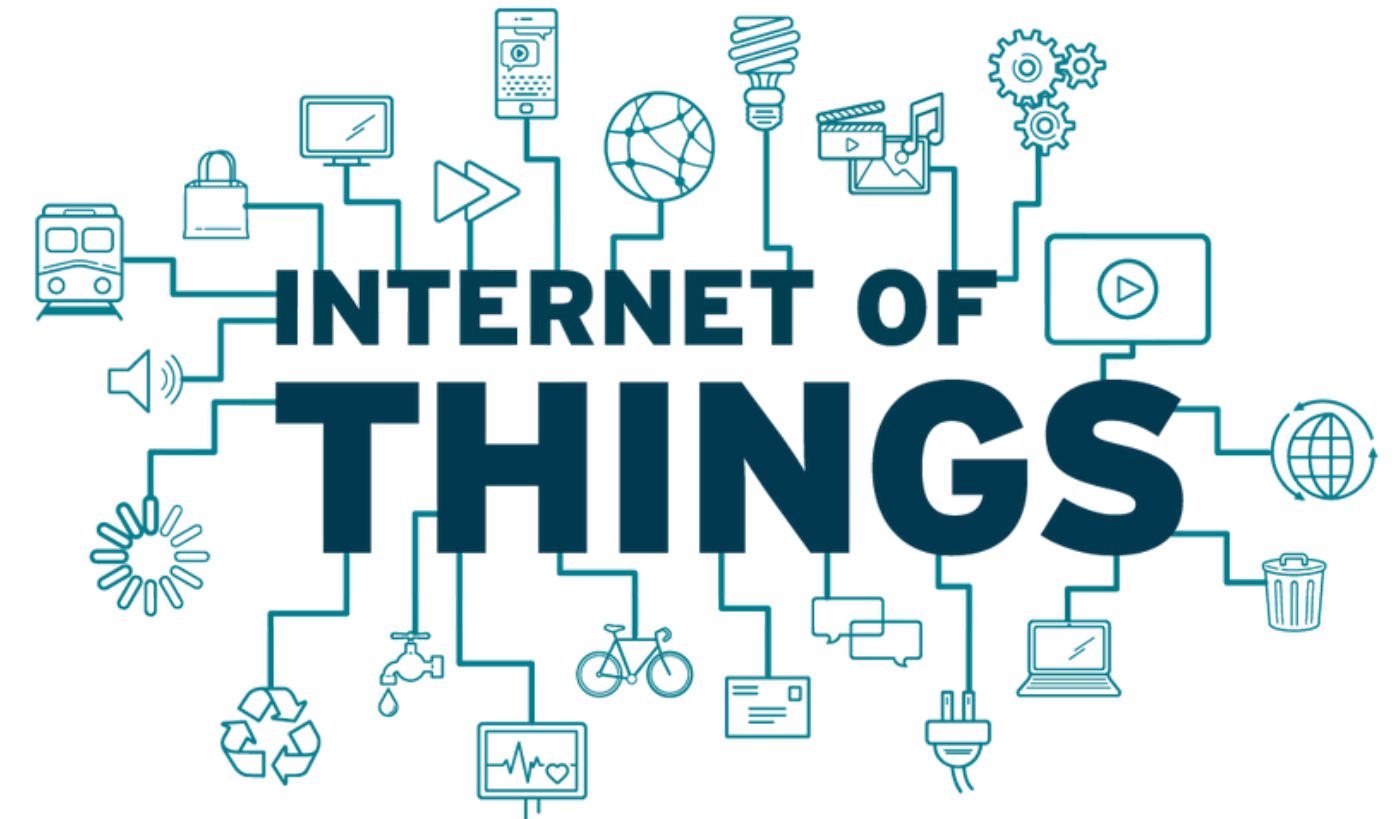
1. Current blockchain architecture has limitations in node numbers and throughput. New consensus algorithms aim for high throughput and scalability.

2. Accumulation of invalid data, like destroyed smart contract addresses, hampers performance; efficient handling of garbage data is needed.








# Result & Conclusion

The survey assesses IoT security threats across multiple layers and investigates solutions like blockchain, fog and edge computing, and machine learning. It also tackles open issues and challenges arising from these solutions, providing insights into the current state and future research directions of IoT security, serving as a valuable resource for securing future IoT applications.



# References



-  [https://www.researchgate.net/publication/333909259\\_A\\_Survey\\_on\\_IoT\\_Security\\_Application\\_Areas\\_Security\\_Threats\\_and\\_Solution\\_Architectures](https://www.researchgate.net/publication/333909259_A_Survey_on_IoT_Security_Application_Areas_Security_Threats_and_Solution_Architectures)
-  T. M. Fernández-Caramés and P. Fraga-Lamas, “A review on the use of blockchain for the Internet of Things,” IEEE Access, vol. 6, pp. 32979–33001, 2018.
-  [https://www.researchgate.net/publication/350827558\\_Emerging\\_Security\\_Threats\\_Countermeasures\\_Issues\\_and\\_Future\\_Aspects\\_on\\_the\\_Internet\\_of\\_Things\\_IoT\\_A\\_Systematic\\_Literature\\_Review](https://www.researchgate.net/publication/350827558_Emerging_Security_Threats_Countermeasures_Issues_and_Future_Aspects_on_the_Internet_of_Things_IoT_A_Systematic_Literature_Review)
-  <https://sites.google.com/site/tictecbell/Arduino/ultrasons/>
-  A. Mosenia and N. K. Jha, “A comprehensive study of security of nternet-of-Things,” IEEE Trans. Emerg. Topics Comput., vol. 5, no. 4, pp. 586–602, Dec. 2017.



# Thank You

