

A Survey on Security and Privacy of 5G Technologies: Progress, Advancements, and Future Directions

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Citation Report

#	ARTICLE	IF	CITATIONS
2	General Secure Information Exchange Protocol for a Multiuser MIMO Relay Channel. Entropy, 2019, 21, 1054.	1.1	0
3	Secure Keying Scheme for Network Slicing in 5G Architecture. , 2019, , .		18
4	Realizing Multi-Access Edge Computing Feasibility: Security Perspective. , 2019, , .		28
5	Privacy Protection and Energy Optimization for 5G-Aided Industrial Internet of Things. IEEE Access, 2020, 8, 183665-183677.	2.6	56
6	The Role of Artificial Intelligence Driven 5G Networks in COVID-19 Outbreak: Opportunities, Challenges, and Future Outlook. Frontiers in Communications and Networks, 2020, 1, .	1.9	28
7	A vision of 6G " 5G's successor. Journal of Management Analytics, 2020, 7, 301-320.	1.6	29
8	A Secure and Energy-Aware Approach For Cognitive Radio Communications. IEEE Open Journal of the Communications Society, 2020, 1, 900-915.	4.4	10
9	Secure Modular Smart Contract Platform for Multi-Tenant 5G Applications. IEEE Access, 2020, 8, 150626-150646.	2.6	6
10	The intelligent multi-domain service function chain deployment: Architecture, challenges and solutions. International Journal of Communication Systems, 2021, 34, .	1.6	8
11	Machine Learning Threatens 5G Security. IEEE Access, 2020, 8, 190822-190842.	2.6	37
12	Security in Energy Harvesting Networks: A Survey of Current Solutions and Research Challenges. IEEE Communications Surveys and Tutorials, 2020, 22, 2658-2693.	24.8	39
13	The Fight Against the COVID-19 Pandemic With 5G Technologies. IEEE Engineering Management Review, 2020, 48, 72-84.	1.0	124
14	Integrating LPWAN Technologies in the 5G Ecosystem: A Survey on Security Challenges and Solutions. IEEE Access, 2020, 8, 216437-216460.	2.6	21
15	REPEL: A Strategic Approach for Defending 5G Control Plane From DDoS Signalling Attacks. IEEE Transactions on Network and Service Management, 2021, 18, 3231-3243.	3.2	7
16	Secrecy Throughput Analysis of Energy Scavenging Overlay Networks with Artificial Noise. , 2020, , .		3
17	Full Duplex Component-Forward Cooperative Communication for a Secure Wireless Communication System. Electronics (Switzerland), 2020, 9, 2102.	1.8	6
18	S6AE: Securing 6LoWPAN Using Authenticated Encryption Scheme. Sensors, 2020, 20, 2707.	2.1	32
19	5G Network Slicing: A Security Overview. IEEE Access, 2020, 8, 99999-100009.	2.6	67

#	ARTICLE	IF	CITATIONS
20	Enabling Roaming Across Heterogeneous IoT Wireless Networks: LoRaWAN MEETS 5G. IEEE Access, 2020, 8, 103164-103180.	2.6	30
21	A Survey of Multi-Access Edge Computing in 5G and Beyond: Fundamentals, Technology Integration, and State-of-the-Art. IEEE Access, 2020, 8, 116974-117017.	2.6	493
22	A Review on Application of Blockchain in 5G and Beyond Networks: Taxonomy, Field-Trials, Challenges and Opportunities. IEEE Access, 2020, 8, 115876-115904.	2.6	58
23	Smart Jamming Attacks in 5G New Radio: A Review. , 2020, , .		41
24	A Survey on Adaptive 360° Video Streaming: Solutions, Challenges and Opportunities. IEEE Communications Surveys and Tutorials, 2020, 22, 2801-2838.	24.8	101
25	Formal Analysis of 5G EAP-TLS Authentication Protocol Using Proverif. IEEE Access, 2020, 8, 23674-23688.	2.6	33
26	The Potential Short- and Long-Term Disruptions and Transformative Impacts of 5G and Beyond Wireless Networks: Lessons Learnt From the Development of a 5G Testbed Environment. IEEE Access, 2020, 8, 11352-11379.	2.6	47
27	Secure Information Transmission with Self Jamming SWIPT. Electronics (Switzerland), 2020, 9, 587.	1.8	3
28	A Sidelink-Aided Approach for Secure Multicast Service Delivery: From Human-Oriented Multimedia Traffic to Machine Type Communications. IEEE Transactions on Broadcasting, 2021, 67, 313-323.	2.5	20
29	Towards security-Aware 5G slice embedding. Computers and Security, 2021, 100, 102075.	4.0	4
30	A Security Awareness and Protection System for 5G Smart Healthcare Based on Zero-Trust Architecture. IEEE Internet of Things Journal, 2021, 8, 10248-10263.	5.5	57
31	Optimized Implementations for ZUC-256 on FPGA. Wireless Personal Communications, 2021, 116, 2615-2632.	1.8	5
32	An enhanced indoor visible light communication physical-layer security scheme for 5G networks: Survey, security challenges, and channel analysis secrecy performance. International Journal of Communication Systems, 2021, 34, e4726.	1.6	7
33	Vulnerabilities in Fog/Edge Computing from Architectural Perspectives. Advances in Information Security, 2021, , 193-212.	0.9	1
34	Toward Enabled Industrial Verticals in 5G: A Survey on MEC-Based Approaches to Provisioning and Flexibility. IEEE Communications Surveys and Tutorials, 2021, 23, 596-630.	24.8	109
35	Mitigating Denial of Service Signaling Threats in 5G Mobile Networks. International Journal of Advanced Computer Science and Applications, 2021, 12, .	0.5	1
36	A Survey of the Main Security Issues and Solutions for the SDN Architecture. IEEE Access, 2021, 9, 122016-122038.	2.6	31
37	Multi-Access Edge Computing Architecture, Data Security and Privacy: A Review. IEEE Access, 2021, 9, 18706-18721.	2.6	65

#	ARTICLE	IF	CITATIONS
38	The Role of Artificial Intelligence and Fifth-Generation (5G) Technology in Mitigating Cyber Physical Attacks on Power Systems. Advances in Computer and Electrical Engineering Book Series, 2021, , 424-441.	0.2	0
39	The Roadmap to 6G Security and Privacy. IEEE Open Journal of the Communications Society, 2021, 2, 1094-1122.	4.4	141
40	An empirical study on vulnerability assessment and penetration detection for highly sensitive networks. Journal of Intelligent Systems, 2021, 30, 592-603.	1.2	5
41	SDR Proof-of-Concept of Full-Duplex Jamming for Enhanced Physical Layer Security. Sensors, 2021, 21, 856.	2.1	3
42	Protecting Web Application Code and Sensitive Data with Symmetric and Identity-Based Cryptosystems. Communications in Computer and Information Science, 2021, , 204-216.	0.4	0
43	Survey on Network Slicing for Internet of Things Realization in 5G Networks. IEEE Communications Surveys and Tutorials, 2021, 23, 957-994.	24.8	216
44	Survey on Multi-Access Edge Computing Security and Privacy. IEEE Communications Surveys and Tutorials, 2021, 23, 1078-1124.	24.8	156
45	Wireless Communication, Sensing, and REM: A Security Perspective. IEEE Open Journal of the Communications Society, 2021, 2, 287-321.	4.4	20
46	Weighted Voting in Physical Layer Authentication for Industrial Wireless Edge Networks. IEEE Transactions on Industrial Informatics, 2022, 18, 2796-2806.	7.2	9
47	5G Intelligence Underpinning Railway Safety in the COVID-19 Era. Frontiers in Built Environment, 2021, 7, .	1.2	8
48	Energy Efficient Secure Communication Model against Cooperative Eavesdropper. Applied Sciences (Switzerland), 2021, 11, 1563.	1.3	2
49	Cyber Electronic Warfare Technologies and Development Directions. The Journal of Korean Institute of Electromagnetic Engineering and Science, 2021, 32, 119-126.	0.0	1
50	Enhanced method of ANN based model for detection of DDoS attacks on multimedia internet of things. Multimedia Tools and Applications, 2022, 81, 26739-26757.	2.6	26
51	Physical-Layer Security Improvement with Reconfigurable Intelligent Surfaces for 6G Wireless Communication Systems. Sensors, 2021, 21, 1439.	2.1	13
52	Secure Device-to-Device communications for 5G enabled Internet of Things applications. Computer Communications, 2021, 169, 114-128.	3.1	37
53	Political and Economic Contexts of Implementing 5G in Poland and in Selected European Countries. Journal of Telecommunications and Information Technology, 2021, 2, 38-48.	0.3	1
54	Research on Network Security Risk and Security Countermeasures of 5G Technology in Power System Application. , 2021, , .		5
55	Distributed Slice Mobility Attack: A Novel Targeted Attack Against Network Slices of 5G Networks. IEEE Networking Letters, 2021, 3, 5-9.	1.5	12

#	ARTICLE	IF	CITATIONS
57	Distributed denial-of-service attack mitigation in network functions virtualization-based 5G networks using management and orchestration. International Journal of Communication Systems, 2021, 34, e4825.	1.6	4
58	A Machine Learning Model for Data Sanitization. Computer Networks, 2021, 189, 107914.	3.2	15
59	Composite and efficient DDoS attack detection framework for B5G networks. Computer Networks, 2021, 188, 107871.	3.2	55
60	Secrecy Analysis of Overlay Mechanism in Radio Frequency Energy Harvesting Networks with Jamming under Nakagami-m fading. Wireless Personal Communications, 2021, 120, 447-479.	1.8	13
61	Learning-Empowered Privacy Preservation in Beyond 5G Edge Intelligence Networks. IEEE Wireless Communications, 2021, 28, 12-18.	6.6	7
62	Concept and vision of 6G wireless endogenous safety and security. Scientia Sinica Informationis, 2023, 53, 344.	0.2	2
64	Design and Analysis of the EWFRT-based Extended Hybrid Carrier System. , 2021, , .		1
65	AI and 6G Security: Opportunities and Challenges. , 2021, , .		78
66	Differential Privacy for Industrial Internet of Things: Opportunities, Applications, and Challenges. IEEE Internet of Things Journal, 2021, 8, 10430-10451.	5.5	74
67	Localization Attack by Precoder Feedback Overhearing in 5G Networks and Countermeasures. IEEE Transactions on Wireless Communications, 2021, 20, 4100-4112.	6.1	5
68	A new authentication and key agreement protocol for 5G wireless networks. Telecommunication Systems, 2021, 78, 317-329.	1.6	12
69	Petri-Net Based Multi-Objective Optimization in Multi-UAV Aided Large-Scale Wireless Power and Information Transfer Networks. Remote Sensing, 2021, 13, 2611.	1.8	7
70	Pilot Assignment Based on Graph Coloring and Location Information in Multicell Multiuser Massive MIMO Systems. Wireless Communications and Mobile Computing, 2021, 2021, 1-12.	0.8	0
71	Emerging DDoS attack detection and mitigation strategies in software-defined networks: Taxonomy, challenges and future directions. Journal of Network and Computer Applications, 2021, 187, 103093.	5.8	38
72	5G Network Security Issues, Challenges, Opportunities and Future Directions: A Survey. Journal of Physics: Conference Series, 2021, 1979, 012037.	0.3	7
73	SANCUS: Multi-layers Vulnerability Management Framework for Cloud-native 5G networks. , 2021, , .		1
74	European Union policy on 5G: Context, scope and limits. Telecommunications Policy, 2021, 45, 102216.	2.6	14
75	Toward securing the control plane of 5G mobile networks against DoS threats: Attack scenarios and promising solutions. Journal of Information Security and Applications, 2021, 61, 102943.	1.8	5

#	ARTICLE	IF	CITATIONS
76	Buffer-aided relay selection for secure communication in two-hop wireless networks with limited packet lifetime. <i>Ad Hoc Networks</i> , 2021, 121, 102580.	3.4	5
77	NFV security survey in 5G networks: A three-dimensional threat taxonomy. <i>Computer Networks</i> , 2021, 197, 108288.	3.2	25
78	Profit maximization for security-aware task offloading in edge-cloud environment. <i>Journal of Parallel and Distributed Computing</i> , 2021, 157, 43-55.	2.7	14
79	A survey on deep learning for challenged networks: Applications and trends. <i>Journal of Network and Computer Applications</i> , 2021, 194, 103213.	5.8	28
80	Machine learning for 5G security: Architecture, recent advances, and challenges. <i>Ad Hoc Networks</i> , 2021, 123, 102667.	3.4	14
81	Role of machine learning and deep learning in securing 5G-driven industrial IoT applications. <i>Ad Hoc Networks</i> , 2021, 123, 102685.	3.4	54
82	5G in Healthcare. <i>Advances in Wireless Technologies and Telecommunication Book Series</i> , 2022, , 51-68.	0.3	1
83	Deep Learning Based Stacked Sparse Autoencoder for PAPR Reduction in OFDM Systems. <i>Intelligent Automation and Soft Computing</i> , 2022, 31, 311-324.	1.6	5
84	Area-Efficient Parallel Reconfigurable Stream Processor for Symmetric Cryptograph. <i>IEEE Access</i> , 2021, 9, 28377-28392.	2.6	1
85	Securing Public Safety Communications on Commercial and Tactical 5G Networks: A Survey and Future Research Directions. <i>IEEE Open Journal of the Communications Society</i> , 2021, 2, 1590-1615.	4.4	21
86	Neurosciences and Wireless Networks: The Potential of Brain-Type Communications and Their Applications. <i>IEEE Communications Surveys and Tutorials</i> , 2021, 23, 1599-1621.	24.8	23
87	Deep Learning and Blockchain-Empowered Security Framework for Intelligent 5G-Enabled IoT. <i>IEEE Access</i> , 2021, 9, 90075-90083.	2.6	52
88	Security in 5G-Enabled Internet of Things Communication: Issues, Challenges, and Future Research Roadmap. <i>IEEE Access</i> , 2021, 9, 4466-4489.	2.6	40
89	A Survey of Decentralizing Applications via Blockchain: The 5G and Beyond Perspective. <i>IEEE Communications Surveys and Tutorials</i> , 2021, 23, 2191-2217.	24.8	60
90	Privacy-Preserving Access for Multi-Access Edge Computing (MEC) Applications. <i>Lecture Notes in Computer Science</i> , 2021, , 44-59.	1.0	1
91	5G Experimentation for Public Safety: Technologies, Facilities and Use Cases. <i>IEEE Access</i> , 2021, 9, 41184-41217.	2.6	22
92	Mobile Edge Computing for Ultra-Reliable and Low-Latency Communications. <i>IEEE Communications Standards Magazine</i> , 2021, 5, 68-75.	3.6	9
93	An study on the application of blockchain based 5G Technology in the Power IoT. <i>E3S Web of Conferences</i> , 2021, 252, 01032.	0.2	0

#	ARTICLE	IF	CITATIONS
94	A Review of Deep Learning in 5G Research: Channel Coding, Massive MIMO, Multiple Access, Resource Allocation, and Network Security. IEEE Open Journal of the Communications Society, 2021, 2, 396-408.	4.4	32
95	Secure Transmission Rate of Short Packets With Queueing Delay Requirement. IEEE Transactions on Wireless Communications, 2022, 21, 203-218.	6.1	11
96	5G Security Challenges and Solutions: A Review by OSI Layers. IEEE Access, 2021, 9, 116294-116314.	2.6	28
97	Market Analysis of MEC-Assisted Beyond 5G Ecosystem. IEEE Access, 2021, 9, 53996-54008.	2.6	18
98	Secure and Resilient Communications in the Industrial Internet. Computer Communications and Networks, 2020, , 219-242.	0.8	12
99	Long Short-Term Memory and Fuzzy Logic for Anomaly Detection and Mitigation in Software-Defined Network Environment. IEEE Access, 2020, 8, 83765-83781.	2.6	74
100	A Deep Q-Learning Sanitization Approach for Privacy Preserving Data Mining. , 2021, , .		6
101	A survey of methods supporting cyber situational awareness in the context of smart cities. Journal of Big Data, 2020, 7, .	6.9	19
102	5G support for Industrial IoT Applicationsâ€™ Challenges, Solutions, and Research gaps. Sensors, 2020, 20, 828.	2.1	139
103	Optimal Edge Nodes Deployment with Multi Association for Smart Health. IEEE Transactions on Molecular, Biological, and Multi-Scale Communications, 2021, , 1-1.	1.4	1
104	Is Today's End-to-End Communication Security Enough for 5G and Its Beyond?. IEEE Network, 2022, 36, 105-112.	4.9	4
105	AI-Based Communication-as-a-Service for Network Management in Society 5.0. IEEE Transactions on Network and Service Management, 2021, 18, 4030-4041.	3.2	6
106	Smart Grid Integration into Smart Cities. , 2021, , .		5
107	Reflective In-Band Full Duplex NOMA Communications for Secure 5G Networks. , 2021, , .		4
108	5G Wireless Networks in the Future Renewable Energy Systems. Frontiers in Energy Research, 2021, 9, .	1.2	12
109	Threat Analysis of 5G Technology Within IIoT Sensors. Lecture Notes in Networks and Systems, 2022, , 389-402.	0.5	0
110	Attitude toward 5G: The moderating effect of regulatory focus. Technology in Society, 2021, 67, 101795.	4.8	9
111	Energy-efficient Resource Allocation for Secure IRS Networks with an Active Eavesdropper. , 2020, , .		4

#	ARTICLE	IF	CITATIONS
112	Online Service Function Chain Deployment for Live-Streaming in Virtualized Content Delivery Networks: A Deep Reinforcement Learning Approach. <i>Future Internet</i> , 2021, 13, 278.	2.4	9
113	A Canvass of 5G Network Slicing: Architecture and Security Concern. <i>IOP Conference Series: Materials Science and Engineering</i> , 2020, 993, 012060.	0.3	5
114	Unsupervised Learning for Secure Short-Packet Transmission Under Statistical QoS Constraints. , 2020, , .		2
115	MEC-enabled 5G Use Cases: A Survey on Security Vulnerabilities and Countermeasures. <i>ACM Computing Surveys</i> , 2022, 54, 1-37.	16.1	33
116	Towards an Extensible Security Monitoring Architecture for Vehicular Networks. <i>Lecture Notes in Computer Science</i> , 2020, , 15-24.	1.0	0
117	A New Approach to Pilot Contamination in Massive MIMO Systems for 5G Communication Networks with Butterfly Optimization Algorithm. <i>Journal of Polytechnic</i> , 2022, 25, 1753-1759.	0.4	3
118	Reinforce Based Optimization in Wireless Communication Technologies and Routing Techniques Using Internet of Flying Vehicles. , 2020, , .		9
119	A Survey on Space-Air-Ground-Sea Integrated Network Security in 6G. <i>IEEE Communications Surveys and Tutorials</i> , 2022, 24, 53-87.	24.8	140
120	The roadmap towards 5G in Iraq: Challenges, Opportunities, and Required Procedures. , 2021, , .		0
121	Security Threats in Wireless Network Communication-Status, Challenges, and Future Trends. , 2021, , .		15
122	Cybersecurity Study in 5G Network Slicing Technology: A Systematic Mapping Review. , 2021, , .		2
123	An Overview of Machine Learning and 5G for People with Disabilities. <i>Sensors</i> , 2021, 21, 7572.	2.1	6
124	Secrecy performance analysis of half/full duplex AF/DF relaying in NOMA systems over κ - μ fading channels. <i>Telecommunication Systems</i> , 2022, 79, 213-231.	1.6	3
125	Waveform-Defined Security: A Low-Cost Framework for Secure Communications. <i>IEEE Internet of Things Journal</i> , 2022, 9, 10652-10667.	5.5	2
126	An Overview of Reinforcement Learning Algorithms for Handover Management in 5G Ultra-Dense Small Cell Networks. <i>Applied Sciences (Switzerland)</i> , 2022, 12, 426.	1.3	36
127	A contemporary survey on free space optical communication: Potentials, technical challenges, recent advances and research direction. <i>Journal of Network and Computer Applications</i> , 2022, 200, 103311.	5.8	86
128	Privacy-preserving blockchain-enabled federated learning for B5G-Driven edge computing. <i>Computer Networks</i> , 2022, 204, 108671.	3.2	25
129	Intelligent Terminal Monitoring System of Distribution Network for 5G Network. , 2020, , .		1

#	ARTICLE	IF	CITATIONS
130	DeepSecure: Detection of Distributed Denial of Service Attacks on 5G Network Slicing – Deep Learning Approach. IEEE Wireless Communications Letters, 2022, 11, 488-492.	3.2	22
131	Using Anomaly Detection Techniques for Securing 5G Infrastructure and Applications. , 2021, , .		1
132	Physical Layer Authentication Using MmWave Channel State Information. , 2021, , .		1
133	Unveiling the user requirements of a cyber range for 5G security testing and training. , 2021, , .		0
134	Overview of Network Softwarization and Its Core Techniques. , 2021, , .		1
135	Formal Verification of 5G EAP-AKA protocol. , 2021, , .		2
136	A Systematic Analysis of 5G Networks With a Focus on 5G Core Security. IEEE Access, 2022, 10, 18298-18319.	2.6	16
138	Wireless Communication Technologies for IoT in 5G: Vision, Applications, and Challenges. Wireless Communications and Mobile Computing, 2022, 2022, 1-12.	0.8	64
139	Multi-Layer Attack Graph Analysis in the 5G Edge Network Using a Dynamic Hexagonal Fuzzy Method. Sensors, 2022, 22, 9.	2.1	7
140	5G – Communication in HealthCare application. Advances in Computers, 2022, , .	1.2	1
142	Lightweight Multifactor Authentication Scheme for NextGen Cellular Networks. IEEE Access, 2022, 10, 31273-31288.	2.6	11
143	Towards Secure and Intelligent Network Slicing for 5G Networks. IEEE Open Journal of the Computer Society, 2022, 3, 23-38.	5.2	13
144	Defense Against Machine Learning Based Attacks in Multi-UAV Networks: A Network Coding Based Approach. IEEE Transactions on Network Science and Engineering, 2022, 9, 2562-2578.	4.1	3
145	AI-Enabled Secure Microservices in Edge Computing: Opportunities and Challenges. IEEE Transactions on Services Computing, 2023, 16, 1485-1504.	3.2	29
147	Quantum Key Distribution for 5G Networks: A Review, State of Art and Future Directions. Future Internet, 2022, 14, 73.	2.4	10
148	Interference Management with Reflective In-Band Full-Duplex NOMA for Secure 6G Wireless Communication Systems. Sensors, 2022, 22, 2508.	2.1	10
149	Computer Vision Operating System of Bank Economic Management Security under 5G Wireless Communication Technology. Wireless Communications and Mobile Computing, 2022, 2022, 1-7.	0.8	0
150	5G-IPAKA: An Improved Primary Authentication and Key Agreement Protocol for 5G Networks. Information (Switzerland), 2022, 13, 125.	1.7	8

#	ARTICLE	IF	CITATIONS
151	The determinants of Mobile government services adoption: The moderating effect of perceived government support (PGS). <i>Information Development</i> , 2024, 40, 110-130.	1.4	0
152	Secrecy-oriented user association in ultra dense heterogeneous networks against strategically colluding adversaries. <i>IET Communications</i> , 2022, 16, 695-709.	1.5	0
153	Deep active reinforcement learning for privacy preserve data mining in 5G environments. <i>Journal of Intelligent and Fuzzy Systems</i> , 2022, 42, 4751-4758.	0.8	1
154	Security Requirements and Challenges of 6G Technologies and Applications. <i>Sensors</i> , 2022, 22, 1969.	2.1	60
155	Privacy-Aware Access Protocols for MEC Applications in 5G. <i>Network</i> , 2022, 2, 203-224.	1.5	1
156	5G Direct to Consumer: A blockchain-based solution 5GD2Chain. , 2021, , .		1
157	5G Vulnerabilities from Security Operation Center's Perspective. , 2021, , .		0
158	UAV-Assisted Multi-Access Edge Computing: Technologies and Challenges. <i>IEEE Internet of Things Magazine</i> , 2021, 4, 12-17.	2.0	17
159	Machine Learning for Physical Layer in 5G and beyond Wireless Networks: A Survey. <i>Electronics (Switzerland)</i> , 2022, 11, 121.	1.8	18
160	5G-Empowered Drone Networks in Federated and Deep Reinforcement Learning Environments. <i>IEEE Communications Standards Magazine</i> , 2021, 5, 55-61.	3.6	8
161	A Study on 5G Technology and Its Applications in Telecommunications. , 2021, , .		7
162	Recent Security Features of 5G Protocol for Real Time Network Domain " An Overview. <i>Journal of ISMAC</i> , 2021, 3, 314-325.	2.2	0
163	An Efficient and Reliable Chaos-Based IoT Security Core for UDP/IP Wireless Communication. <i>IEEE Access</i> , 2022, 10, 49625-49656.	2.6	12
164	Mobile Edge Computing: Security and privacy issues, challenges and countermeasures. <i>SSRN Electronic Journal</i> , 0, , .	0.4	5
165	5G: The next-generation technology for edge communication. , 2022, , 373-394.		1
166	Customized 5G and Beyond Private Networks with Integrated URLLC, eMBB, mMTC, and Positioning for Industrial Verticals. <i>IEEE Communications Standards Magazine</i> , 2022, 6, 52-57.	3.6	22
167	Formal Verification and Analysis of 5G AKA Protocol Using Mixed Strand Space Model. <i>Electronics (Switzerland)</i> , 2022, 11, 1333.	1.8	2
168	Physical Layer Anonymous Communications: An Anonymity Entropy Oriented Precoding Design (Invited) Tj ETQq1 1 0.784314 rgBT /Ov		

#	ARTICLE	IF	CITATIONS
169	Online machine learning-based physical layer authentication for MmWave MIMO systems. Ad Hoc Networks, 2022, 131, 102864.	3.4	0
170	Research on Automatic Driving Simulation Test System Based on Digital Twin. Journal of Physics: Conference Series, 2022, 2170, 012039.	0.3	4
171	Semantic Transfer Between Different Tasks in the Semantic Communication System. , 2022, , .		2
172	5GAKA-LCCO: A Secure 5G Authentication and Key Agreement Protocol with Less Communication and Computation Overhead. Information (Switzerland), 2022, 13, 257.	1.7	4
173	Utilization of mobile edge computing on the Internet of Medical Things: A survey. ICT Express, 2023, 9, 473-485.	3.3	23
174	Blockchain for Future Wireless Networks: A Decade Survey. Sensors, 2022, 22, 4182.	2.1	8
175	Secure Information Transmission for B5G HetNets: A Robust Game Approach. IEEE Internet of Things Journal, 2022, 9, 21505-21519.	5.5	1
176	Collective Intelligence Using 5G: Concepts, Applications, and Challenges in Sociotechnical Environments. IEEE Access, 2022, 10, 70394-70417.	2.6	6
177	Recent Security Features of 5G Protocol for Real Time Network Domain – An Overview. Journal of ISMAC, 2021, 3, 314-325.	2.2	0
178	Physical layer security using beamforming techniques for 5G and beyond networks: A systematic review. Physical Communication, 2022, 54, 101791.	1.2	13
179	Locality of Technical Objects and the Role of Structural Interventions for Systemic Change. , 2022, , .		2
180	Building a Digital Twin for Industrial Internet of Things with Interoperability. , 2022, , .		0
181	A Layered Approach to Threat Modeling for 5G-Based Systems. Electronics (Switzerland), 2022, 11, 1819.	1.8	4
182	Machine learning security attacks and defense approaches for emerging cyber physical applications: A comprehensive survey. Computer Communications, 2022, 192, 316-331.	3.1	10
183	Future smart cities: requirements, emerging technologies, applications, challenges, and future aspects. Cities, 2022, 129, 103794.	2.7	175
184	Secure Transmission for Hierarchical Information Accessibility in Downlink MU-MIMO. IEEE Transactions on Communications, 2022, 70, 6181-6195.	4.9	2
186	Smart healthcare using blockchain technologies: The importance, applications, and challenges. , 2022, , 163-180.		1
187	Downlink Power Minimization in Intelligent Reflecting Surface Aided Security Classification Wireless Communications System. IEEE Systems Journal, 2023, 17, 407-418.	2.9	1

#	ARTICLE	IF	CITATIONS
188	Digital Smart-Grid Mobile-Renewable Energy-Services Usage in Nigeria 5G-Readiness Arrangement. , 2022, , .		0
189	IoT-Enabled 5G Networks for Secure Communication. Advances in Information Security, Privacy, and Ethics Book Series, 2022, , 1-29.	0.4	0
190	A deep learning based misbehavior classification scheme for intrusion detection in cooperative intelligent transportation systems. Digital Communications and Networks, 2023, 9, 1113-1122.	2.7	7
191	Research on Intelligent Vehicle Infrastructure Cooperative System Based on 5G Mobile Edge Computing. , 2021, , .		0
192	6G Communication: Next Generation Technology for IoT Applications. , 2021, , .		1
193	Secrecy Performance Analysis of Cooperative Nonorthogonal Multiple Access in IoT Networks. IEEE Sensors Journal, 2022, 22, 19030-19045.	2.4	4
194	A Review on 5G Network System with its limitation and different Approaches to build strong 5G Network System. , 2022, , .		2
195	A Secure MIMO Wireless Communication Systems Based on Hamiltonian Graphs and Artificial Noise. , 2022, , .		1
196	Transfer Learning Approach for 6G-IoT Applications. , 2022, , .		1
197	Orchestration of data-intensive pipeline in 5G-enabled Edge Continuum. , 2022, , .		4
198	Joint Security-vs-QoS Framework: Optimizing the Selection of Intrusion Detection Mechanisms in 5G networks. , 2022, , .		1
199	A Survey on 5G and LPWAN-IoT for Improved Smart Cities and Remote Area Applications: From the Aspect of Architecture and Security. Sensors, 2022, 22, 6313.	2.1	27
200	A tenant-driven slicing enforcement scheme based on Pervasive Intelligence in the Radio Access Network. Computer Networks, 2022, 217, 109285.	3.2	2
201	Artificial Intelligence Development and Music Education System Reform in the Context of 5G Network. Wireless Communications and Mobile Computing, 2022, 2022, 1-10.	0.8	0
202	Scalable Secret Key Generation for Wireless Sensor Networks. IEEE Systems Journal, 2022, 16, 6031-6041.	2.9	4
203	Balancing QoS and Security in the Edge: Existing Practices, Challenges, and 6G Opportunities With Machine Learning. IEEE Communications Surveys and Tutorials, 2022, 24, 2419-2448.	24.8	17
204	A Model-Driven Security Analysis Approach for 5G Communications in Industrial Systems. IEEE Transactions on Wireless Communications, 2023, 22, 889-902.	6.1	1
205	Zero Touch Management: A Survey of Network Automation Solutions for 5G and 6G Networks. IEEE Communications Surveys and Tutorials, 2022, 24, 2535-2578.	24.8	17

#	ARTICLE	IF	CITATIONS
206	The Standardisation of Lawful Interception Technologies in the 3gpp. Interrogating 5g and Surveillance Amid Us-China Competition. SSRN Electronic Journal, 0, , .	0.4	3
207	Wireless Backhaul in 5G and Beyond: Issues, Challenges and Opportunities. IEEE Communications Surveys and Tutorials, 2022, 24, 2579-2632.	24.8	26
208	Application of mathematics in design of group key management method. I-manager's Journal on Mathematics, 2022, 11, 31.	0.3	0
209	A New Tracking-Attack Scenario Based on the Vulnerability and Privacy Violation of 5G AKA Protocol. IEEE Access, 2022, 10, 77679-77687.	2.6	2
210	Trusted Access Scheme Based on Blockchain. , 2022, , .		0
211	Review Paper on 5G Network. International Journal of Advanced Research in Science, Communication and Technology, 0, , 592-597.	0.0	0
212	Optimal Allocation Method of 5G Communication System Resources Assisted by Artificial Intelligence Technology. Wireless Communications and Mobile Computing, 2022, 2022, 1-9.	0.8	1
213	Secret key generation over a Nakagami-m fading channel with correlated eavesdropping channel. Science China Information Sciences, 2022, 65, .	2.7	1
214	Improved dropping attacks detecting system in 5g networks using machine learning and deep learning approaches. Multimedia Tools and Applications, 2023, 82, 13973-13995.	2.6	14
215	5G System Overview for Ongoing Smart Applications: Structure, Requirements, and Specifications. Computational Intelligence and Neuroscience, 2022, 2022, 1-11.	1.1	13
216	Cyber Brittleness of Smart Cities. , 2022, , 19-40.		3
217	The DAG blockchain: A secure edge assisted honeypot for attack detection and multi-controller based load balancing in SDN 5G. Future Generation Computer Systems, 2023, 141, 339-354.	4.9	9
218	Reinforcement Learning-Based Physical Cross-Layer Security and Privacy in 6G. IEEE Communications Surveys and Tutorials, 2023, 25, 425-466.	24.8	21
219	Threat modeling framework for mobile communication systems. Computers and Security, 2023, 125, 103047.	4.0	4
220	XAuth: Secure and Privacy-Preserving Cross-Domain Handover Authentication for 5G HetNets. IEEE Internet of Things Journal, 2023, 10, 5962-5976.	5.5	3
221	Covert Channel Detection Methods. , 2022, , .		1
222	Five Facets of 6G: Research Challenges and Opportunities. ACM Computing Surveys, 2023, 55, 1-39.	16.1	29
227	Intelligent Reflecting Surface-Assisted Physical Layer Key Generation with Deep Learning in MIMO Systems. Sensors, 2023, 23, 55.	2.1	4

#	ARTICLE	IF	CITATIONS
228	A Survey on Machine Learning-Based Misbehavior Detection Systems for 5G and Beyond Vehicular Networks. IEEE Communications Surveys and Tutorials, 2023, 25, 1128-1172.	24.8	15
229	Securing SSK-based Communications via Friendly Jamming and Antenna Selection. , 2022, , .		1
230	Lightweight Flexible Group Authentication Utilizing Historical Collaboration Process Information. IEEE Transactions on Communications, 2023, 71, 2260-2273.	4.9	3
231	A Survey of Machine and Deep Learning Methods for Privacy Protection in the Internet of Things. Sensors, 2023, 23, 1252.	2.1	10
232	5G, 6G, and Beyond: Recent advances and future challenges. Annales Des Telecommunications/Annals of Telecommunications, 2023, 78, 525-549.	1.6	14
234	Security Challenges in 5G Network: A technical features survey and analysis. , 2022, , .		3
235	Robust Secrecy via Aerial Reflection and Jamming: Joint Optimization of Deployment and Transmission. IEEE Internet of Things Journal, 2023, 10, 12562-12576.	5.5	4
236	An efficient edge computing management mechanism for sustainable smart cities. Sustainable Computing: Informatics and Systems, 2023, 38, 100867.	1.6	11
237	Open RAN security: Challenges and opportunities. Journal of Network and Computer Applications, 2023, 214, 103621.	5.8	16
238	A Survey on harnessing the Applications of Mobile Computing in Healthcare during the COVID-19 Pandemic: Challenges and Solutions. Computer Networks, 2023, 224, 109605.	3.2	5
239	Prospect of 6G Applications Based on 5G Technology. , 2022, , 2711-2722.		0
240	Overview: Security in 5G Wireless Systems. Lecture Notes in Networks and Systems, 2023, , 139-146.	0.5	0
241	Nested Hash Access With Post Quantum Encryption for Mission-Critical IoT Communications. IEEE Internet of Things Journal, 2023, 10, 12204-12218.	5.5	6
242	Survey of Technology in Network Security Situation Awareness. Sensors, 2023, 23, 2608.	2.1	3
243	Grant-Free SCMA Design Using SDN/NFV With Physical Layer Security. IEEE Transactions on Network and Service Management, 2023, 20, 2124-2135.	3.2	1
244	Evolution of 5G: Security, Emerging Technologies, and Impact. Cognitive Science and Technology, 2023, , 693-706.	0.2	0
245	Cloud based IoT Electronic Healthcare Data Warehouse Integration in emerging 5G Health Grid Ecosystem. Journal of ISMAC, 2023, 5, 30-54.	2.2	1
246	Collaborative Authentication for 6G Networks: An Edge Intelligence Based Autonomous Approach. IEEE Transactions on Information Forensics and Security, 2023, 18, 2091-2103.	4.5	1

#	ARTICLE	IF	CITATIONS
247	An interpretability security framework for intelligent decision support systems based on saliency map. International Journal of Information Security, 2023, 22, 1249-1260.	2.3	1
248	A Network Traffic Mutation Based Ontology, and Its Application to 5G Networks. IEEE Access, 2023, 11, 43925-43944.	2.6	4
250	Effect of Power Conversion Efficiency of the RF Energy Harvester on the Security and Data Rate of the Self-Sustainable IoT Devices. , 2023, , .		0
255	Scoping Review of Literature on the Application of Blockchain in Finance. Advances in Finance, Accounting, and Economics, 2023, , 1-28.	0.3	0
256	Enhanced AES for Improved Privacy in 5G-Enabled IoT Network. Lecture Notes in Networks and Systems, 2023, , 135-146.	0.5	0
257	Application of AI & ML in 5G Communication. Transactions on Computer Systems and Networks, 2023, , 149-170.	0.5	2
258	UE Security Reloaded: Developing a 5G Standalone User-Side Security Testing Framework. , 2023, , .		1
264	An Analysis of Edge Computing with Multi Access in 5-G Technology. , 2023, , .		0
265	A Study on Secure Network Slicing in 5G. , 2023, , .		0
267	Fault Management Platform based on Knowledge Graph in Network Slicing Environment. , 2023, , .		0
268	Research on Fault Management System based on Artificial Intelligence in Data Network. , 2023, , .		0
269	Pandai Smart Highway. Advances in Intelligent Systems and Computing, 2023, , 461-470.	0.5	0
271	Security Services for Wireless 5G Internet of Things (IoT) Systems. , 2023, , 169-195.		0
272	Securing 5G OpenRAN with a Scalable Authorization Framework for xApps. , 2023, , .		2
273	Developing xApps for Rogue Base Station Detection in SDR-Enabled O-RAN. , 2023, , .		2
275	Deep Learning-based Anomaly Detection for 5G Core Mobility Management. , 2023, , .		0
276	Securing Public Safety Mission-Critical 5G Communications of Smart Cities. Signals and Communication Technology, 2024, , 61-74.	0.4	1
279	6G-IoT Framework for Sustainable Smart City: Vision and Challenges. , 2023, , 97-117.		1

#	ARTICLE	IF	CITATIONS
280	Secure and Privacy-preserving Network Slicing in 3GPP 5G System Architecture. , 2023, , .		0
292	Subscription Management for Beyond 5G and 6G Cellular Networks Using Blockchain Technology. , 2023, , .		0
293	6G: Vision, Applications, and Challenges. Signals and Communication Technology, 2024, , 15-69.	0.4	0
294	Lightweight Authentication in Edge Collaborations Utilizing Multi-dimensional Historical Information: Design and Implementation. , 2023, , .		0
295	Future Cybersecurity Challenges for IoE Networks. Internet of Things, 2024, , 75-86.	1.3	0
296	GreenEdge: Neural-enhanced Green Workload Coordination for Ubiquitous Edge Intelligence. , 2023, , .		0
298	A Defense in Depth with Zero Trust Architecture for Securing 5G Networks. , 2023, , .		0
299	Implementation and Analysis of a Customized Encryption Algorithm in 5G Networks for Educational Purposes. , 2023, , .		0
300	Design of Majority Decoded Codes and Decoding Algorithm Based on Error Propagation Analysis. , 2023, , .		0
304	Noma Based Full Duplex 6G Communication Systems. , 2023, , .		0
306	Blockchain Applications in 5G Networks: Incentives. , 2023, , .		0
307	Role of Blockchain Technology in Protecting a Cloud Architecture. Advances in Information Security, Privacy, and Ethics Book Series, 2024, , 76-104.	0.4	0
309	Threat Modeling Framework for UEs in 5G. , 2023, , .		0
310	Distributed Ledger Technology for Next-Generation Cellular Networks: A SWOT Analysis. , 2024, , 281-304.		0