

Review of digital twin about concepts, technologies, and

Journal of Manufacturing Systems

58, 346-361

DOI: [10.1016/j.jmsy.2020.06.017](https://doi.org/10.1016/j.jmsy.2020.06.017)

Citation Report

#	ARTICLE	IF	CITATIONS
1	Digital Twin Conceptual Model within the Context of Internet of Things. Future Internet, 2020, 12, 163.	2.4	54
2	Deep learning-empowered digital twin for visualized weld joint growth monitoring and penetration control. Journal of Manufacturing Systems, 2020, 57, 429-439.	7.6	58
3	A knowledge-based Digital Shadow for machining industry in a Digital Twin perspective. Journal of Manufacturing Systems, 2021, 58, 168-179.	7.6	80
4	Prediction maintenance integrated decision-making approach supported by digital twin-driven cooperative awareness and interconnection framework. Journal of Manufacturing Systems, 2021, 58, 329-345.	7.6	66
5	A digital twin-based big data virtual and real fusion learning reference framework supported by industrial internet towards smart manufacturing. Journal of Manufacturing Systems, 2021, 58, 16-32.	7.6	81
6	Lab-scale Models of Manufacturing Systems for Testing Real-time Simulation and Production Control Technologies. Journal of Manufacturing Systems, 2021, 58, 93-108.	7.6	20
7	A novel approach for solid particle erosion prediction based on Gaussian Process Regression. Wear, 2021, 466-467, 203549.	1.5	9
8	Towards Integrated Digital Twins for Industrial Products: Case Study on an Overhead Crane. Applied Sciences (Switzerland), 2021, 11, 683.	1.3	27
9	Digital Twins to Enable Smart Heritage Facilities Management: A Systematic Literature Review. , 2021, , .		1
10	Privacy-Aware Resource Sharing in Cross-Device Federated Model Training for Collaborative Predictive Maintenance. IEEE Access, 2021, 9, 120367-120379.	2.6	15
11	Prediction Study of the Heavy Vehicle Driving State Based on Digital Twin Model. , 2021, , .		4
12	A Multi-Model Approach for Simulation-Based Digital Twin in Resilient Services. WSEAS Transactions on Systems and Control, 2021, 16, 133-145.	0.5	20
13	Coevolution of digitalisation, organisations and Product Development Cycle. CIRP Annals - Manufacturing Technology, 2021, 70, 519-542.	1.7	10
14	Data-Model Combined Driven Digital Twin of Life-Cycle Rolling Bearing. IEEE Transactions on Industrial Informatics, 2022, 18, 1530-1540.	7.2	73
15	Digital twins are shaping future virtual worlds. Service Oriented Computing and Applications, 2021, 15, 93-95.	1.3	5
16	The Concept of Building a Network of Digital Twins to Increase the Efficiency of Complex Telecommunication Systems. Complexity, 2021, 2021, 1-9.	0.9	11
17	Processes Organization for Creating Competitive Products and Production Services of an Industrial Enterprise: Management Problems and Solutions. Herald of the Bauman Moscow State Technical University Series Mechanical Engineering, 2021, , 156-165.	0.1	1
18	Digital Twin-driven machining process for thin-walled part manufacturing. Journal of Manufacturing Systems, 2021, 59, 453-466.	7.6	64

#	ARTICLE	IF	CITATIONS
19	Differentiating Digital Twin from Digital Shadow: Elucidating a Paradigm Shift to Expedite a Smart, Sustainable Built Environment. Buildings, 2021, 11, 151.	1.4	144
20	A generic methodology and a digital twin for zero defect manufacturing (ZDM) performance mapping towards design for ZDM. Journal of Manufacturing Systems, 2021, 59, 507-521.	7.6	67
21	Optimization of Refrigeration Defrost Schedules for Demand Shifting in Commercial Buildings. , 2021, , .		3
22	Reduction of CO2 Emissions in Steelmaking by Means of Utilization of Steel Plant Waste Heat to Stabilize Seasonal Cooling Water Temperature. Sustainability, 2021, 13, 5957.	1.6	0
23	Digital Twin: Origin to Future. Applied System Innovation, 2021, 4, 36.	2.7	279
24	Lifetime Prediction Using a Tribology-Aware, Deep Learning-Based Digital Twin of Ball Bearing-Like Tribosystems in Oil and Gas. Processes, 2021, 9, 922.	1.3	21
25	Physical, data-driven and hybrid approaches to model engine exhaust gas temperatures in operational conditions. Ships and Offshore Structures, 2022, 17, 1360-1381.	0.9	11
26	Digital Twin for Automatic Transportation in Industry 4.0. Sensors, 2021, 21, 3344.	2.1	51
27	Performance Comparison for Scientific Computations on the Edge via Relative Performance. , 2021, , .		1
28	Sustainability Requirements of Digital Twin-Based Systems: A Meta Systematic Literature Review. Applied Sciences (Switzerland), 2021, 11, 5519.	1.3	22
29	Development of a Digital Twin of a Local Road Network: A Case Study. Journal of Testing and Evaluation, 2022, 50, 2901-2915.	0.4	6
30	Resilience learning through self adaptation in digital twins of human-cyber-physical systems. , 2021, , .		7
31	Construction method of shop-floor digital twin based on MBSE. Journal of Manufacturing Systems, 2021, 60, 93-118.	7.6	36
32	Digital Twin Concepts with Uncertainty for Nuclear Power Applications. Energies, 2021, 14, 4235.	1.6	49
33	Assembly system design using interval-based customer demand. Journal of Manufacturing Systems, 2021, 60, 239-251.	7.6	7
34	Digital Twins for Flexibility Service Provision from Industrial Energy Systems. , 2021, , .		1
35	Supervised-learning-based approximation method for multi-server queueing networks under different service disciplines with correlated interarrival and service times. International Journal of Production Research, 2022, 60, 5176-5200.	4.9	4
36	How to Set Up the Pillars of Digital Twins Technology in Our Business: Entities, Challenges and Solutions. Processes, 2021, 9, 1307.	1.3	8

#	ARTICLE	IF	CITATIONS
37	Digital Twin-Driven Mating Performance Analysis for Precision Spool Valve. <i>Machines</i> , 2021, 9, 157.	1.2	12
38	Digital twin application in the construction industry: A literature review. <i>Journal of Building Engineering</i> , 2021, 40, 102726.	1.6	200
40	Digital Twin in Electrical Machine Control and Predictive Maintenance: State-of-the-Art and Future Prospects. <i>Energies</i> , 2021, 14, 5933.	1.6	34
41	DIGITAL TWIN CONCEPT FOR RENEWABLE ENERGY SOURCES. <i>Konya Journal of Engineering Sciences</i> , 0, , 780-788.	0.1	0
42	Development of a Digital Twin for Enzymatic Hydrolysis Processes. <i>Processes</i> , 2021, 9, 1734.	1.3	4
43	A Survey on AI-Driven Digital Twins in Industry 4.0: Smart Manufacturing and Advanced Robotics. <i>Sensors</i> , 2021, 21, 6340.	2.1	95
44	A Workflow for Synthetic Data Generation and Predictive Maintenance for Vibration Data. <i>Information (Switzerland)</i> , 2021, 12, 386.	1.7	1
45	Automated Container Terminal Production Operation and Optimization via an AdaBoost-Based Digital Twin Framework. <i>Journal of Advanced Transportation</i> , 2021, 2021, 1-16.	0.9	10
46	A Digital Twin Architecture to Optimize Productivity within Controlled Environment Agriculture. <i>Applied Sciences (Switzerland)</i> , 2021, 11, 8875.	1.3	37
47	Enhanced partial frequency variation starting of hydroelectric pumping units: Model based design and experimental validation. <i>International Journal of Electrical Power and Energy Systems</i> , 2021, 131, 107083.	3.3	4
48	Secure sharing of big digital twin data for smart manufacturing based on blockchain. <i>Journal of Manufacturing Systems</i> , 2021, 61, 338-350.	7.6	40
49	A Digital Twin-Driven Methodology for Material Resource Planning Under Uncertainties. <i>IFIP Advances in Information and Communication Technology</i> , 2021, , 321-329.	0.5	7
50	Enablers and Barriers to the Implementation of Digital Twins in the Process Industry: A Systematic Literature Review. , 2020, , .		12
51	Digital Twins From Smart Manufacturing to Smart Cities: A Survey. <i>IEEE Access</i> , 2021, 9, 143222-143249.	2.6	95
52	Introduction to Digital Twin Engineering. , 2021, , .		23
53	Maintenance Strategies for Industrial Multi-Stage Machines: The Study of a Thermoforming Machine. <i>Sensors</i> , 2021, 21, 6809.	2.1	4
54	Steering Representationsâ€”Towards a Critical Understanding of Digital Twins. <i>Philosophy and Technology</i> , 2021, 34, 1751-1773.	2.6	13
55	Security Concept of Digital Twins of Industrial Fuel and Energy Complex Objects. <i>Smart Innovation, Systems and Technologies</i> , 2022, , 357-367.	0.5	0

#	ARTICLE	IF	CITATIONS
57	Implementation of digital twins in the process industry: A systematic literature review of enablers and barriers. <i>Computers in Industry</i> , 2022, 134, 103558.	5.7	91
58	Data Link for the Creation of Digital Twins. <i>IEEE Access</i> , 2020, 8, 228675-228684.	2.6	19
59	Product Lifecycle: Social and Political Reflections from the Digital and Sustainable Perspectives. , 0, , .		0
60	Real-time combination of material flow simulation, digital twins of manufacturing cells, an AGV and a mixed-reality application. <i>Procedia CIRP</i> , 2021, 104, 1607-1612.	1.0	8
61	Developing Digital Twins to Characterize Bridge Behavior Using Measurements Taken under Random Traffic. <i>Journal of Bridge Engineering</i> , 2022, 27, .	1.4	12
62	Towards a digital twin for characterising natural source zone depletion: A feasibility study based on the Bemidji site. <i>Water Research</i> , 2022, 208, 117853.	5.3	12
63	Application of the Digital Twin for in process monitoring of the micro injection moulding process quality. <i>Computers in Industry</i> , 2022, 135, 103568.	5.7	16
64	Emerging Technical Debt in Digital Twin Systems. , 2021, , .		3
65	A Review: Machine Tools Digital Twin Modeling And Application. , 2021, , .		0
66	Digital twins for collaboration and self-integration. , 2021, , .		9
67	Prediction of Energy Consumption in Digital Twins of Intelligent Factory by Artificial Intelligence. , 2021, , .		2
68	An Architecture and Information Meta-model for Back-end Data Access via Digital Twins. , 2021, , .		6
69	Digital Twin-Enabled Decision Support in Mission Engineering and Route Planning. <i>Systems</i> , 2021, 9, 82.	1.2	6
70	Smart Master Production Schedule for the Supply Chain: A Conceptual Framework. <i>Computers</i> , 2021, 10, 156.	2.1	9
71	Shop Floor Digital Twin in Smart Manufacturing: A Systematic Literature Review. <i>Sustainability</i> , 2021, 13, 12987.	1.6	20
72	Digital Twin conceptual framework for improving critical infrastructure resilience. <i>Automatisierungstechnik</i> , 2021, 69, 1062-1080.	0.4	10
73	Building Power Grid 2.0: Deep Learning and Federated Computations for Energy Decarbonization and Edge Resilience. <i>Advances in Intelligent Systems and Computing</i> , 2022, , 263-293.	0.5	0
74	A Framework for Virtual Evaluation of Body-Attached Sensor Networks. <i>Lecture Notes in Mechanical Engineering</i> , 2022, , 557-568.	0.3	1

#	ARTICLE	IF	CITATIONS
75	Knowledge mapping of digital twin and physical internet in Supply Chain Management: A systematic literature review. <i>International Journal of Production Economics</i> , 2022, 244, 108381.	5.1	49
76	Digital Twin in Aerospace Industry: A Gentle Introduction. <i>IEEE Access</i> , 2022, 10, 9543-9562.	2.6	51
77	Establishing a reliable mechanism model of the digital twin machining system: An adaptive evaluation network approach. <i>Journal of Manufacturing Systems</i> , 2022, 62, 390-401.	7.6	25
78	New digital triad (DT-II) concept for lifecycle information integration of sustainable manufacturing systems. <i>Journal of Industrial Information Integration</i> , 2022, 26, 100316.	4.3	10
79	Hybrid Modeling Based Digital Twin for Performance Optimization with Flexible Operation in the Direct Air-Cooling Power Unit. <i>SSRN Electronic Journal</i> , 0, , .	0.4	0
80	Developing a Physical and Digital Twin: An Example Process Model. , 2021, , .		3
81	Smart Design of Green Hydrogen Facilities: A Digital Twin-driven approach. <i>E3S Web of Conferences</i> , 2022, 334, 02001.	0.2	3
82	Advanced facility management. , 2022, , 583-605.		0
83	Design of digital twin applications in automated storage yard scheduling. <i>Advanced Engineering Informatics</i> , 2022, 51, 101477.	4.0	32
84	Cognitive Digital Twins for Resilience in Production: A Conceptual Framework. <i>Information (Switzerland)</i> , 2022, 13, 33.	1.7	12
85	Overview on Digital Twin for Autonomous Electrical Vehicles Propulsion Drive System. <i>Sustainability</i> , 2022, 14, 601.	1.6	35
86	Human-robot collaboration empowered by hidden semi-Markov model for operator behaviour prediction in a smart assembly system. <i>Journal of Manufacturing Systems</i> , 2022, 62, 317-333.	7.6	27
87	Assessing the impact of automation in pharmaceutical quality control labs using a digital twin. <i>Journal of Manufacturing Systems</i> , 2022, 62, 270-285.	7.6	7
88	The Role of Digital Twins in Connected and Automated Vehicles. <i>IEEE Intelligent Transportation Systems Magazine</i> , 2022, 14, 41-51.	2.6	35
89	Digital Twin for Cybersecurity: Towards Enhancing Cyber Resilience. <i>Lecture Notes of the Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering</i> , 2022, , 57-76.	0.2	5
90	Digital twin-driven intelligence disaster prevention and mitigation for infrastructure: advances, challenges, and opportunities. <i>Natural Hazards</i> , 2022, 112, 1-36.	1.6	26
91	Development of a digital twin operational platform using Python Flask. <i>Data-Centric Engineering</i> , 2022, 3, .	1.2	9
92	Digital twins in industry 4.0. , 2022, , 277-316.		32

#	ARTICLE	IF	CITATIONS
93	Digital Transformation in Ship Operations and Management. <i>Advances in Logistics, Operations, and Management Science Book Series</i> , 2022, , 116-139.	0.3	2
94	Federated learning enabled digital twins for smart cities: Concepts, recent advances, and future directions. <i>Sustainable Cities and Society</i> , 2022, 79, 103663.	5.1	94
95	A Novel Architecture Combining Oracle With Decentralized Learning for IIoT. <i>IEEE Internet of Things Journal</i> , 2023, 10, 3774-3785.	5.5	7
96	Digital twins for land-based aquaculture: A case study for rainbow trout (<i>Oncorhynchus mykiss</i>). <i>Open Research Europe</i> , 0, 2, 16.	2.0	2
97	A multidisciplinary approach to the development of digital twin models of critical care delivery in intensive care units. <i>International Journal of Production Research</i> , 2022, 60, 4197-4213.	4.9	8
98	External corrosion of oil and gas pipelines: A review of failure mechanisms and predictive preventions. <i>Journal of Natural Gas Science and Engineering</i> , 2022, 100, 104467.	2.1	93
99	Digital Twins in Asset Management: Potential Application Use Cases in Rail and Road Infrastructures. <i>Lecture Notes in Mechanical Engineering</i> , 2022, , 250-260.	0.3	2
100	Digital Twin of Building Heating Substation: An Example of a Digital Twin of a Cyber-Physical System. <i>Studies in Systems, Decision and Control</i> , 2022, , 61-73.	0.8	1
101	A Unified Approach to Digital Twin Architecture – Proof-of-Concept Activity in the Nuclear Sector. <i>IEEE Access</i> , 2022, 10, 44691-44709.	2.6	8
102	Development of a System Dynamics Simulation for Assessing Manufacturing Systems Based on the Digital Twin Concept. <i>Applied Sciences (Switzerland)</i> , 2022, 12, 2095.	1.3	3
103	Digital Twin and Smart Manufacturing in Industries: A Bibliometric Analysis with a Focus on Industry 4.0. <i>Sensors</i> , 2022, 22, 1388.	2.1	24
104	Using Digital Twin Documents to Control a Smart Factory: Simulation Approach with ROS, Gazebo, and Twinbase. <i>Machines</i> , 2022, 10, 225.	1.2	12
105	Digital Twin-Based Automated Guided Vehicle Scheduling: A Solution for Its Charging Problems. <i>Applied Sciences (Switzerland)</i> , 2022, 12, 3354.	1.3	12
106	Digital Twins About Humans – Design Objectives From Three Projects. <i>Journal of Computing and Information Science in Engineering</i> , 2022, 22, .	1.7	4
107	The process correlation interaction construction of Digital Twin for dynamic characteristics of machine tool structures with multi-dimensional variables. <i>Journal of Manufacturing Systems</i> , 2022, 63, 78-94.	7.6	15
108	Smart City Construction and Management by Digital Twins and BIM Big Data in COVID-19 Scenario. <i>ACM Transactions on Multimedia Computing, Communications and Applications</i> , 2022, 18, 1-21.	3.0	52
109	Energy digital twin technology for industrial energy management: Classification, challenges and future. <i>Renewable and Sustainable Energy Reviews</i> , 2022, 161, 112407.	8.2	98
110	Industrial internet of things and unsupervised deep learning enabled real-time occupational safety monitoring in cold storage warehouse. <i>Safety Science</i> , 2022, 152, 105766.	2.6	24

#	ARTICLE	IF	CITATIONS
111	An Integrated Platform for Multi-Model Digital Twins. , 2021, , .		1
112	Can a Byte Improve Our Bite? An Analysis of Digital Twins in the Food Industry. Sensors, 2022, 22, 115.	2.1	22
113	An Overview of Digital Twin Concept for Key Components of Renewable Energy Systems. International Journal of Robotics and Automation Technology, 0, 8, 29-47.	0.2	3
114	Getting Real: The Challenge of Building and Validating a Large-Scale Digital Twin of Barcelonaâ€™s Traffic with Empirical Data. ISPRS International Journal of Geo-Information, 2022, 11, 24.	1.4	17
115	Digital Twin-Driven Human Robot Collaboration Using a Digital Human. Sensors, 2021, 21, 8266.	2.1	30
116	Impact on Inference Model Performance for ML Tasks Using Real-Life Training Data and Synthetic Training Data from GANs. Information (Switzerland), 2022, 13, 9.	1.7	0
117	The Modelling of Digital Twins Technology in the Construction Process of Prefabricated Buildings. Advances in Civil Engineering, 2021, 2021, 1-11.	0.4	6
118	Conceptual and mathematical models, methods, and technologies for the study of the digital transformation of economic and social systems: a literature review and research agenda (Part I). Administrative Consulting, 2021, , 95-108.	0.1	3
119	A Complete Environmental Intelligence System for LiDAR-Based Vegetation Management in Power-Line Corridors. Remote Sensing, 2021, 13, 5159.	1.8	3
120	Factory Operating System (FOS): Vertical Integration Framework for Smart Factories. , 2021, , .		0
121	Digital twin-based decision making paradigm of raise boring method. Journal of Intelligent Manufacturing, 2023, 34, 2387-2405.	4.4	8
122	Integration of Design, Manufacturing, and Service Based on Digital Twin to Realize Intelligent Manufacturing. Machines, 2022, 10, 275.	1.2	10
123	Multi-type feature extraction and classification of leakage in oil pipeline network using digital twin technology. Journal of Ambient Intelligence and Humanized Computing, 2022, 13, 5885-5901.	3.3	8
124	Digital Twin Concept Developing on an Electrical Distribution Systemâ€™An Application Case. Energies, 2022, 15, 2836.	1.6	11
125	A digital twin ecosystem for additive manufacturing using a real-time development platform. International Journal of Advanced Manufacturing Technology, 2022, 120, 6547-6563.	1.5	28
126	Digital Twin: A Comprehensive Survey of Security Threats. IEEE Communications Surveys and Tutorials, 2022, 24, 1475-1503.	24.8	63
127	Managing Input Parameter Uncertainty in Digital Twins. IFAC-PapersOnLine, 2022, 55, 13-18.	0.5	2
128	Identifying the Development Trends and Technological Competition Situations for Digital Twin: A Bibliometric Overview and Patent Landscape Analysis. IEEE Transactions on Engineering Management, 2024, 71, 1998-2021.	2.4	2

#	ARTICLE	IF	CITATIONS
129	Digital Twins in the Industry: Maturity, Functions, Effects. Lecture Notes in Information Systems and Organisation, 2022, , 1-12.	0.4	3
130	Digital twin technology " awareness, implementation problems and benefits. Engineering Management in Production and Services, 2022, 14, 63-77.	0.5	2
131	Digital Twin for Civil Engineering Systems: An Exploratory Review for Distributed Sensing Updating. Sensors, 2022, 22, 3168.	2.1	58
132	Research focus for construction robotics and human-robot teams towards resilience in construction: scientometric review. Journal of Engineering, Design and Technology, 2023, 21, 502-526.	1.1	12
133	Industrial digitalization in the industry 4.0 era: Classification, reuse and authoring of digital models on Digital Twin platforms. Array, 2022, 14, 100176.	2.5	14
134	Gross error detection in steam turbine measurements based on data reconciliation of inequality constraints. Energy, 2022, 253, 124009.	4.5	4
135	A detection and configuration method for welding completeness in the automotive body-in-white panel based on digital twin. Scientific Reports, 2022, 12, 7929.	1.6	8
137	Development of a 5G-enabled Digital Twin of a Machine Tool. Procedia CIRP, 2022, 107, 173-178.	1.0	7
139	Towards a Requirement-driven Digital Twin Architecture. Procedia CIRP, 2022, 107, 758-763.	1.0	3
140	A digital twin modeling approach for smart manufacturing combined with the UNISON framework. Computers and Industrial Engineering, 2022, 169, 108262.	3.4	14
141	Digital twins supported equipment maintenance model in intelligent water conservancy. Computers and Electrical Engineering, 2022, 101, 108033.	3.0	9
142	Blockchain-Based Fine-Grained Digital Twin Sharing Framework for Socialized Cloud Manufacturing. SSRN Electronic Journal, 0, , .	0.4	0
143	Digital Twins for Distributed Intelligent Sensing and Control Systems. Studies in Computational Intelligence, 2022, , 119-130.	0.7	2
144	Clasdi: Parametric Physics-Informed Greedy Latent Space Dynamics Identification. SSRN Electronic Journal, 0, , .	0.4	4
145	Digital Twinning for condition monitoring of Marine Propulsion Assets. , 2022, , .		1
146	Design Principles for Consolidated Digital Twin of a Telecommunication Tower. , 2022, , .		0
147	Opportunities and Challenges to Develop Digital Twins for Subsea Pipelines. Journal of Marine Science and Engineering, 2022, 10, 739.	1.2	17
148	Digital Twin-Enabled Production Optimization for Steel Industry. , 2022, , .		3

#	ARTICLE	IF	CITATIONS
149	Applications of Digital Twin across Industries: A Review. Applied Sciences (Switzerland), 2022, 12, 5727.	1.3	67
150	Integrated three-dimensional visualization and soft-sensing system for underground paste backfilling. Tunnelling and Underground Space Technology, 2022, 127, 104578.	3.0	5
151	The Digital Twin Model of Chemical Production Systems in Smart Factories: A Case Study. , 2021, , .		1
152	A Collaborative Industrial Augmented Reality Digital Twin: Developing the Future of Shipyard 4.0. Lecture Notes of the Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering, 2022, , 104-120.	0.2	4
153	Towards Digital Twin in the Context of Power Wheelchairs Provision and Support. IFIP Advances in Information and Communication Technology, 2022, , 95-102.	0.5	3
154	Ship's Digital Twin – A Review of Modelling Challenges and Applications. Applied Sciences (Switzerland), 2022, 12, 6039.	1.3	12
155	Vibration-Based System Degradation Monitoring under Gear Wear Progression. Coatings, 2022, 12, 892.	1.2	3
156	Integrated Smart Warehouse and Manufacturing Management with Demand Forecasting in Small-Scale Cyclical Industries. Machines, 2022, 10, 472.	1.2	12
157	Research on audible noise of ultra-high voltage direct current (UHV DC) transmission lines with a digital twin. Digital Twin, 0, 2, 9.	0.0	1
158	Digital Twins for Intelligent Green Buildings. Buildings, 2022, 12, 856.	1.4	33
159	Digital Twin and Cloud BIM-XR Platform Development: From Scan-to-BIM-to-DT Process to a 4D Multi-User Live App to Improve Building Comfort, Efficiency and Costs. Energies, 2022, 15, 4497.	1.6	13
160	Towards Resilient and Sustainable Rail and Road Networks: A Systematic Literature Review on Digital Twins. Sustainability, 2022, 14, 7060.	1.6	18
161	Hybrid modeling-based digital twin for performance optimization with flexible operation in the direct air-cooling power unit. Energy, 2022, 254, 124492.	4.5	16
162	On the Design of a Privacy-Preserving Communication Scheme for Cloud-Based Digital Twin Environments Using Blockchain. IEEE Access, 2022, 10, 75365-75375.	2.6	20
163	Network science for the supply chain. , 2022, , 343-359.		1
165	The Digital Supply Chain – emergence, concepts, definitions, and technologies. , 2022, , 3-24.		21
167	The cloud, platforms, and digital twins – Enablers of the digital supply chain. , 2022, , 77-91.		17
168	Digital Twin-Driven Sheet Metal Forming: Modeling and Application for Stamping Considering Mold Wear. Journal of Manufacturing Science and Engineering, Transactions of the ASME, 2022, 144, .	1.3	2

#	ARTICLE	IF	CITATIONS
169	Machine-Learning-Based Digital Twin in Manufacturing: A Bibliometric Analysis and Evolutionary Overview. <i>Applied Sciences (Switzerland)</i> , 2022, 12, 6512.	1.3	6
170	Digital Twin for Human-Robot Interactions by Means of Industry 4.0 Enabling Technologies. <i>Sensors</i> , 2022, 22, 4950.	2.1	27
171	Exploring users and non-users views of the Digital Twin on a mHealth app: a Thematic, qualitative approach. <i>Cogent Psychology</i> , 2022, 9, .	0.6	2
172	Is Metaverse in education a blessing or a curse: a combined content and bibliometric analysis. <i>Smart Learning Environments</i> , 2022, 9, .	4.3	204
173	Towards a connected Digital Twin Learning Ecosystem in manufacturing: Enablers and challenges. <i>Computers and Industrial Engineering</i> , 2022, 171, 108463.	3.4	21
174	Dynamic Reduction-Based Virtual Models for Digital Twins-A Comparative Study. <i>Applied Sciences (Switzerland)</i> , 2022, 12, 7154.	1.3	1
175	Industry application of digital twin: from concept to implementation. <i>International Journal of Advanced Manufacturing Technology</i> , 2022, 121, 4289-4312.	1.5	29
176	Toward a Practical Digital Twin Platform Tailored to the Requirements of Industrial Energy Systems. <i>Applied Sciences (Switzerland)</i> , 2022, 12, 6981.	1.3	9
177	Digital Twin Technology - A bibliometric study of top research articles based on Local Citation Score. <i>Journal of Manufacturing Systems</i> , 2022, 64, 390-408.	7.6	9
178	Model construction of material distribution system based on digital twin. <i>International Journal of Advanced Manufacturing Technology</i> , 2022, 121, 4485-4501.	1.5	2
179	Simulation platform for the assessment of PEM electrolyzer models oriented to implement digital Replicas. <i>Energy Conversion and Management</i> , 2022, 267, 115917.	4.4	17
180	Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. <i>International Journal of Information Management</i> , 2022, 66, 102542.	10.5	702
181	Requirements to a digital twin-centered concept for smart manufacturing in modular plants considering distributed knowledge. <i>Computer Aided Chemical Engineering</i> , 2022, , 1507-1512.	0.3	5
182	The Role of a Behavioural Model for the Virtual Commissioning of Robotic Manufacturing Systems. <i>Research Papers Faculty of Materials Science and Technology Slovak University of Technology in Trnava</i> , 2022, 30, 45-52.	0.4	1
183	Digital Twin-Assisted Efficient Reinforcement Learning for Edge Task Scheduling. , 2022, , .		7
184	Integration Of The Mape-K Loop In Digital Twins. , 2022, , .		13
185	Design and Implementation of OPC UA-Based VR/AR Collaboration Model Using CPS Server for VR Engineering Process. <i>Applied Sciences (Switzerland)</i> , 2022, 12, 7534.	1.3	2
186	Structured Development of Digital Twins-A Cross-Domain Analysis towards a Unified Approach. <i>Processes</i> , 2022, 10, 1490.	1.3	5

#	ARTICLE	IF	CITATIONS
187	Digital Twin-Driven Machine Condition Monitoring: A Literature Review. Journal of Sensors, 2022, 2022, 1-13.	0.6	5
188	Enhancing and securing cyber-physical systems and Industry 4.0 through digital twins: A critical review. Journal of Software: Evolution and Process, 2023, 35, .	1.2	9
189	From simple digital twin to complex digital twin Part I: A novel modeling method for multi-scale and multi-scenario digital twin. Advanced Engineering Informatics, 2022, 53, 101706.	4.0	54
190	Machine-Learning-Based Digital Twin System for Predicting the Progression of Prostate Cancer. Applied Sciences (Switzerland), 2022, 12, 8156.	1.3	4
191	Towards Integrated Design and Operation of Complex Engineering Systems With Predictive Modeling: State-of-the-Art and Challenges. Journal of Mechanical Design, Transactions of the ASME, 2022, 144, .	1.7	1
192	Digital twins™ implications for innovation. Technology Analysis and Strategic Management, 0, , 1-13.	2.0	14
193	Toward digital twin development for additively manufactured turbine blades with experimental and analytical methods. Structural and Multidisciplinary Optimization, 2022, 65, .	1.7	1
194	Digital Twins: State of the art theory and practice, challenges, and open research questions. Journal of Industrial Information Integration, 2022, 30, 100383.	4.3	53
195	Digital Twin-based Quality Management Method for the Assembly Process of Aerospace Products with the Grey-Markov Model and Apriori Algorithm. Chinese Journal of Mechanical Engineering (English) Tj ETQq0 0 0 rgB.19/Overlook 10 Tf 50	1.9	1
196	Impactful Digital Twin in the Healthcare Revolution. Big Data and Cognitive Computing, 2022, 6, 83.	2.9	48
197	Application of Artificial Immune Systems in Advanced Manufacturing. Array, 2022, 15, 100238.	2.5	4
198	Digital twin and machine learning for decision support in thermal power plant with combustion engines. Knowledge-Based Systems, 2022, 253, 109578.	4.0	14
199	Digital twins: An analysis framework and open issues. Computers in Industry, 2022, 143, 103763.	5.7	48
200	Hybrid modelling and simulation of thermal systems of in-service power plants for digital twin development. Energy, 2022, 260, 125088.	4.5	16
201	A consistency evaluation method for digital twin models. Journal of Manufacturing Systems, 2022, 65, 158-168.	7.6	17
202	Digital twin-enabled machining process modeling. Advanced Engineering Informatics, 2022, 54, 101737.	4.0	30
203	Applying digital twins for the management of information in turnaround event operations in commercial airports. Advanced Engineering Informatics, 2022, 54, 101723.	4.0	12
204	Social Cyber-Physical Systems and Digital Twins Networks: A perspective about the future digital twin ecosystems. IFAC-PapersOnLine, 2022, 55, 31-36.	0.5	11

#	ARTICLE	IF	CITATIONS
205	Digital Twin-Based Services and Data Visualization of Material Handling Equipment in Smart Production Logistics Environment. IFIP Advances in Information and Communication Technology, 2022, , 556-564.	0.5	0
206	Survey on Digital Twin Edge Networks (DITEN) Toward 6G. IEEE Open Journal of the Communications Society, 2022, 3, 1360-1381.	4.4	29
207	Current Status and Future Perspective of the Human Digital Twin. Journal of the Robotics Society of Japan, 2022, 40, 579-584.	0.0	0
208	Railway Digital Twins and Artificial Intelligence: Challenges and Design Guidelines. Communications in Computer and Information Science, 2022, , 102-113.	0.4	6
209	Has enterprise digital transformation improved the efficiency of enterprise technological innovation? A case study on Chinese listed companies. Mathematical Biosciences and Engineering, 2022, 19, 12632-12654.	1.0	29
210	An enhanced methodology of Fault Detection and Diagnosis based on Digital Twin. IFAC-PapersOnLine, 2022, 55, 43-48.	0.5	0
211	Roof Segmentation Towards Digital Twin Generation in LoD2+ Using Deep Learning. IFAC-PapersOnLine, 2022, 55, 173-178.	0.5	0
212	Concept of hybrid modeled digital twins and its application for an energy management of manufacturing systems. Procedia CIRP, 2022, 112, 549-554.	1.0	9
213	Combining Open Source and Commercial Tools in Digital Twin for Cities Generation. IFAC-PapersOnLine, 2022, 55, 185-189.	0.5	4
214	Overview of Emerging Technologies for Improving the Performance of Heavy-Duty Construction Machines. IEEE Access, 2022, 10, 103315-103336.	2.6	2
215	A digital twin five-dimensional structural model construction method suitable for active distribution network. , 2022, , .		2
216	Thermal management for gas lubricated, high-speed turbomachinery. Applied Thermal Engineering, 2023, 218, 119229.	3.0	2
217	The fundamentals and strategies of maintenance, repair, and overhaul (MRO) in Industry 4.0. , 2022, , .		1
218	Plankton digital twins a new research tool. Journal of Plankton Research, 0, , .	0.8	3
219	A General Digital Twin Framework for Intelligent Network Management. , 2022, , .		1
220	Simulation Model for Digital Twins of Pneumatic Vacuum Ejectors. Chemical Engineering and Technology, 2023, 46, 71-79.	0.9	2
221	Research Directions for Merging Geospatial Technologies with Smart Manufacturing Systems. Smart and Sustainable Manufacturing Systems, 2022, 6, 228-246.	0.3	2
222	Towards a digital twin for supporting multi-agency incident management in a smart city. Scientific Reports, 2022, 12, .	1.6	13

#	ARTICLE	IF	CITATIONS
223	Data and model hybrid-driven virtual reality robot operating system. <i>Frontiers in Energy Research</i> , 0, 10, .	1.2	0
224	Digital Twins in Human-Computer Interaction: A Systematic Review. <i>International Journal of Human-Computer Interaction</i> , 2024, 40, 79-97.	3.3	11
225	Product evolution analysis for design adaptation using big sales data. <i>Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture</i> , 2023, 237, 1241-1253.	1.5	2
226	Design of a More Efficient Rotating-EM Energy Floor with Lead-Screw and Clutch Mechanism. <i>Energies</i> , 2022, 15, 6539.	1.6	5
227	Predictive Maintenance of Automotive Component Using Digital Twin Model. , 0, , .		2
228	Digital twin and big data-driven sustainable smart manufacturing based on information management systems for energy-intensive industries. <i>Applied Energy</i> , 2022, 326, 119986.	5.1	52
229	Digital Twin and Human Factors in Manufacturing and Logistics Systems: State of the Art and Future Research Directions. <i>IFAC-PapersOnLine</i> , 2022, 55, 1893-1898.	0.5	10
230	Visual Human Localization and Safety Monitoring in a Digital Twin of Workspace. , 2022, , .		2
231	A methodology for creating semantic digital twin models supported by knowledge graphs. , 2022, , .		2
232	Enabling Digital Twins to Support the UN SDGs. <i>Big Data and Cognitive Computing</i> , 2022, 6, 115.	2.9	11
233	Experimental validation of non-Newtonian stratified co-extrusion prediction models using a digital process twin. <i>Polymer Engineering and Science</i> , 2022, 62, 3902-3922.	1.5	2
235	Human knowledge centered maintenance decision support in digital twin environment. <i>Journal of Manufacturing Systems</i> , 2022, 65, 528-537.	7.6	18
236	Data-driven statistical nonlinearization technique based on information entropy. <i>Probabilistic Engineering Mechanics</i> , 2022, , 103376.	1.3	0
237	An Interoperable Digital Twin with the IEEE 1451 Standards. <i>Sensors</i> , 2022, 22, 7590.	2.1	9
238	Digital twin and its applications in the construction industry: A state-of-art systematic review. <i>Digital Twin</i> , 0, 2, 15.	0.0	7
239	Revisiting digital twins: Origins, fundamentals, and practices. <i>Frontiers of Engineering Management</i> , 2022, 9, 668-676.	3.3	7
240	Digital Twin as Industrial Robots Manipulation Validation Tool. <i>Robotics</i> , 2022, 11, 113.	2.1	6
241	Designing an Experimental Setup for Digital Twins in Modern Manufacturing—A Case Study Using a Water Bottling Plant. <i>Lecture Notes in Networks and Systems</i> , 2023, , 615-622.	0.5	0

#	ARTICLE	IF	CITATIONS
242	Brillouin fiber optic sensors and mobile augmented reality-based digital twins for quantitative safety assessment of underground pipelines. <i>Automation in Construction</i> , 2022, 144, 104617.	4.8	22
243	Building Artificial-Intelligence Digital Fire (AID-Fire) system: A real-scale demonstration. <i>Journal of Building Engineering</i> , 2022, 62, 105363.	1.6	17
244	Exploring the role of green and Industry 4.0 technologies in achieving sustainable development goals in food sectors. <i>Food Research International</i> , 2022, 162, 112068.	2.9	49
245	Assessment of Digital Twins to Reassign Multiskilled Workers in Offsite Construction Based on Lean Thinking. <i>Journal of Construction Engineering and Management - ASCE</i> , 2023, 149, .	2.0	8
246	Dedicated Adaptive Particle Swarm Optimization Algorithm for Digital Twin Based Control Optimization of the Plug-In Hybrid Vehicle. <i>IEEE Transactions on Transportation Electrification</i> , 2023, 9, 3137-3148.	5.3	3
247	A Low-Cost Digital Twin-Driven Positioning Error Compensation Method for Industrial Robotic Arm. <i>IEEE Sensors Journal</i> , 2022, 22, 22885-22893.	2.4	8
248	Optimization of Load-Balancing Strategy by Self-Powered Sensor and Digital Twins in Software-Defined Networks. <i>IEEE Sensors Journal</i> , 2023, 23, 20782-20793.	2.4	0
249	A digital twin-based framework for multi-element seismic hybrid simulation of structures. <i>Mechanical Systems and Signal Processing</i> , 2023, 186, 109909.	4.4	8
250	Sistema inteligente para la detección de fallas basado en redes profundas auto-ajustables. , 2022, , .		0
251	Challenges and possible approaches for sustainable digital twinning. , 2022, , .		2
252	Data reconciliation-based simulation of thermal power plants for performance estimation and digital twin development. <i>Computers and Chemical Engineering</i> , 2022, 168, 108063.	2.0	3
253	Building Resilient Post-pandemic Supply Chains Through Digital Transformation. <i>Springer Series in Supply Chain Management</i> , 2023, , 211-223.	0.5	1
254	Digital modeling-driven chatter suppression for thin-walled part manufacturing. <i>Journal of Intelligent Manufacturing</i> , 2024, 35, 289-305.	4.4	4
255	A digital twin for ⁶⁴ Cu production with cyclotron and solid target system. <i>Scientific Reports</i> , 2022, 12, .	1.6	4
256	Blockchain-based trust mechanism for digital twin empowered Industrial Internet of Things. <i>Future Generation Computer Systems</i> , 2023, 141, 16-27.	4.9	34
257	HCI and Digital Twins – A Critical Look. , 2022, , .		3
258	Ultrafast Near-Ideal Phase-Change Memristive Physical Unclonable Functions Driven by Amorphous State Variations. <i>Advanced Science</i> , 2022, 9, .	5.6	5
259	Efficient Hydrodynamic Modelling of Urban Stormwater Systems for Real-Time Applications. <i>Modelling</i> , 2022, 3, 464-480.	0.8	2

#	ARTICLE	IF	CITATIONS
260	Digital twin to digital triplet: Machine learning, additive manufacturing and computational fluid dynamics simulations. AIP Conference Proceedings, 2022, , .	0.3	1
261	A digital twin in transportation: Real-time synergy of traffic data streams and simulation for virtualizing motorway dynamics. Advanced Engineering Informatics, 2023, 55, 101858.	4.0	19
262	Simplexity testbed: A model-based digital twin testbed. Computers in Industry, 2023, 145, 103804.	5.7	4
263	XPlAM: A toolkit for automating the acquisition of BDI agent-based Digital Twins of organizations. Computers in Industry, 2023, 145, 103805.	5.7	3
264	A time-evolving digital twin tool for engineering dynamics applications. Mechanical Systems and Signal Processing, 2023, 188, 109971.	4.4	8
265	Toward IoRT Collaborative Digital Twin Technology Enabled Future Surgical Sector: Technical Innovations, Opportunities and Challenges. IEEE Access, 2022, 10, 129079-129104.	2.6	3
266	Digital Twin-Based Monitoring System of Induction Motors Using IoT Sensors and Thermo-Magnetic Finite Element Analysis. IEEE Access, 2023, 11, 1682-1693.	2.6	7
267	Human-centric Application in Cyber-Physical System: An Inertial-based Motion Capture and Recognition System. , 2022, , .		1
268	Digital Twin Software Overview with Text Mining Techniques. , 2022, , .		0
269	A Sample Efficient Multi-Agent Approach to Continuous Reinforcement Learning. , 2022, , .		0
270	A digital twin enabled wearable device for customized healthcare. Digital Twin, 0, 2, 17.	0.0	1
271	Application of Digital Twins and Metaverse in the Field of Fluid Machinery Pumps and Fans: A Review. Sensors, 2022, 22, 9294.	2.1	15
272	Offsite Construction: Reflection is Simply Not Good Enough â€” We Need a New Prism!. IOP Conference Series: Earth and Environmental Science, 2022, 1101, 042003.	0.2	0
273	Review of Digital Twins for Constructed Facilities. Buildings, 2022, 12, 2029.	1.4	9
274	Implementation of a novel data-driven approach to optimise UK offsite housing delivery. IOP Conference Series: Earth and Environmental Science, 2022, 1101, 042029.	0.2	0
275	Digital Twin in the Provision of Power Wheelchairs Context: Support for Technical Phases and Conceptual Model. Computers, 2022, 11, 166.	2.1	1
276	A comprehensive review of digital twin””Part 1: modeling and twinning enabling technologies. Structural and Multidisciplinary Optimization, 2022, 65, .	1.7	69
277	Applications of Vehicles and Its Related Technology in Previous and the Next Decade. , 2023, , 49-73.		0

#	ARTICLE	IF	CITATIONS
278	Digital Twin and Its Applications. , 2023, , 151-170.		0
279	Usage of GAMS-Based Digital Twins and Clustering to Improve Energetic Systems Control. Energies, 2023, 16, 123.	1.6	1
280	Industrial applications of digital twin technology in the mining sector: An overview. CIM Journal, 2023, 14, 97-106.	0.3	1
281	Success factors of digital technologies (DT) tools adoption for sustainable construction in a developing economy. Construction Innovation, 2022, ahead-of-print, .	1.5	5
282	Digital Twin for a Collaborative Painting Robot. Sensors, 2023, 23, 17.	2.1	6
283	Digital Twin-Based Zero-Touch Management for IoT. Electronics (Switzerland), 2022, 11, 4104.	1.8	5
284	Marketing Strategies 4.0: Recent Trends and Technologies in Marketing. Sustainability, 2022, 14, 16356.	1.6	13
285	Lean Ergonomics“are relevant synergies of digital human models and digital twins defining a new emerging subdiscipline?. Zeitschrift für Arbeitswissenschaft, 2022, 76, 401-415.	0.7	1
286	Digital Twin in Sport: From an Idea to Realization. Applied Sciences (Switzerland), 2022, 12, 12741.	1.3	3
287	Cloud-based process design in a digital twin framework with integrated and coupled technology models for blisk milling. , 0, 2, .		1
288	Application of Digital Twin in Handling and Transportation of Hazardous Chemicals. Applied Sciences (Switzerland), 2022, 12, 12746.	1.3	2
289	Sustainable value in the fashion industry: A case study of value construction/destruction using digital twins. Sustainable Development, 2023, 31, 1652-1667.	6.9	6
290	Hyperreal Patients. Digital Twins as Simulacra and their impact on clinical heuristics. Techno:Phil, 2023, , 193-207.	0.3	1
291	Digital Manufacturing. , 2023, , 65-80.		0
292	Major opportunities of digital twins for smart buildings: a scientometric and content analysis. Smart and Sustainable Built Environment, 2024, 13, 63-84.	2.2	5
293	Digital Twin for Experimental Data Fusion Applied to a Semi-Industrial Furnace Fed with H2-Rich Fuel Mixtures. Energies, 2023, 16, 662.	1.6	1
294	Five Disruptive Technologies in 6G to Support Digital Twin Networks. IEEE Wireless Communications, 2024, 31, 149-155.	6.6	5
295	Construction of the optical-mechanical installation and calibration process technology on the basis of the digital twin. , 2023, , .		0

#	ARTICLE	IF	CITATIONS
297	TwinXR: Method for using digital twin descriptions in industrial eXtended reality applications. <i>Frontiers in Virtual Reality</i> , 0, 4, .	2.5	3
298	Digital Twin Modeling Method for Hierarchical Stiffened Plate Based on Transfer Learning. <i>Aerospace</i> , 2023, 10, 66.	1.1	6
299	Physics-based modelling of robotâ€™s gearbox including non-linear phenomena. <i>International Journal of Computer Integrated Manufacturing</i> , 0, , 1-12.	2.9	4
300	Digital twin for ship life-cycle: A critical systematic review. <i>Ocean Engineering</i> , 2023, 269, 113479.	1.9	27
301	A new quantitative digital twin maturity model for high-end equipment. <i>Journal of Manufacturing Systems</i> , 2023, 66, 248-259.	7.6	7
302	Real-time optimization for a Digital Twin of a robotic cell with human operators. <i>Computers in Industry</i> , 2023, 146, 103858.	5.7	3
303	Digital Twin: Where do humans fit in?. <i>Automation in Construction</i> , 2023, 148, 104749.	4.8	14
304	A Digital Twin Case Study Exhibiting Bi-Directional Communication and Control. , 2022, , .		0
305	Connection, Communication and Value Co-creation: Construction of ICT Enabled Health Management Platform. , 2022, , .		0
306	Multiple Digital Twins Competing in Manipulator Tasks. , 2022, , .		0
307	Collaboration of Digital Twins Through Linked Open Data: Architecture With FIWARE as Enabling Technology. <i>IT Professional</i> , 2022, 24, 41-46.	1.4	2
308	A Comparative Analysis of Anomaly Detection Algorithm for Digital Twin. <i>Journal of Digital Contents Society</i> , 2022, 23, 2497-2506.	0.1	0
309	Research on Data Security Framework for the New Generation Mobile Network. , 2023, , 1228-1238.		0
310	Digital Twin Based Definition (DTBD) Modeling Technology for Product Life Cycle Management and Optimization. <i>Lecture Notes in Mechanical Engineering</i> , 2023, , 573-583.	0.3	0
311	Overview of Digital Twin Platforms for EV Applications. <i>Sensors</i> , 2023, 23, 1414.	2.1	10
313	Urban scale climate change adaptation through smart technologies. , 2023, , 253-283.		0
314	Enhancing Digital Twins of Semi-Automatic Production Lines by Digitizing Operator Skills. <i>Applied Sciences (Switzerland)</i> , 2023, 13, 1637.	1.3	2
315	A systematic review of digital twin about physical entities, virtual models, twin data, and applications. <i>Advanced Engineering Informatics</i> , 2023, 55, 101876.	4.0	53

#	ARTICLE	IF	CITATIONS
316	Digital twin-based multi-level task rescheduling for robotic assembly line. Scientific Reports, 2023, 13, .	1.6	5
317	Predictive digital twin for offshore wind farms. Energy Informatics, 2023, 6, .	1.4	17
318	Contextualizing realism: An analysis of acts of seeing and recording in Digital Twin datafication. Big Data and Society, 2023, 10, 205395172311550.	2.6	1
319	Digital Twins in Battery Cell Production. Lecture Notes in Production Engineering, 2023, , 823-832.	0.3	0
320	A Hybrid Architecture of Digital Twin with Decision Support Layer for Industrial Maintenance. Lecture Notes in Mechanical Engineering, 2023, , 584-591.	0.3	2
321	Integrating Lean Data and Digital Sobriety in Digital Twins Through Dynamic Accuracy Management. Studies in Computational Intelligence, 2023, , 107-117.	0.7	1
322	Software framework concept with visual programming and digital twin for intuitive process creation with multiple robotic systems. Robotics and Computer-Integrated Manufacturing, 2023, 82, 102536.	6.1	6
323	Metaverse in Education: Vision, Opportunities, and Challenges. , 2022, , .		51
324	A Novel Distribution Network Operating State Monitoring and Fault Prediction Model Based on Digital Emulation. Lecture Notes in Electrical Engineering, 2023, , 965-971.	0.3	0
325	An Evaluative Study on IoT Ecosystem for Smart Predictive Maintenance (IoT-SPM) in Manufacturing: Multiview Requirements and Data Quality. IEEE Internet of Things Journal, 2023, 10, 11160-11184.	5.5	9
326	Digital Twins in agriculture: challenges and opportunities for environmental sustainability. Current Opinion in Environmental Sustainability, 2023, 61, 101252.	3.1	22
327	Faceting the post-disaster built heritage reconstruction process within the digital twin framework for Notre-Dame de Paris. Scientific Reports, 2023, 13, .	1.6	12
328	Overview of predictive maintenance based on digital twin technology. Heliyon, 2023, 9, e14534.	1.4	29
329	Digital Twin (DT)-CycleGAN: Enabling Zero-Shot Sim-to-Real Transfer of Visual Grasping Models. IEEE Robotics and Automation Letters, 2023, 8, 2421-2428.	3.3	3
330	Petri nets-based digital twin drives dual-arm cooperative manipulation. Computers in Industry, 2023, 147, 103880.	5.7	6
331	Digital twin of a Fresnel solar collector for solar cooling. Applied Energy, 2023, 339, 120944.	5.1	5
332	Development of a surrogate model of an amine scrubbing digital twin using machine learning methods. Computers and Chemical Engineering, 2023, 174, 108252.	2.0	3
333	A digital twin framework for real-time ship routing considering decarbonization regulatory compliance. Ocean Engineering, 2023, 278, 114407.	1.9	3

#	ARTICLE	IF	CITATIONS
334	Digital twin of electric vehicle battery systems: Comprehensive review of the use cases, requirements, and platforms. <i>Renewable and Sustainable Energy Reviews</i> , 2023, 179, 113280.	8.2	14
335	Reduced order modeling of a pressure column of an air separation unit using the Dynamic Edmister Method. <i>Computers and Chemical Engineering</i> , 2023, 174, 108250.	2.0	0
336	A novel maritime autonomous navigation decision-making system: Modeling, integration, and real ship trial. <i>Expert Systems With Applications</i> , 2023, 222, 119825.	4.4	11
337	Extending the capability of component digital threads using material passports. <i>Journal of Manufacturing Processes</i> , 2023, 87, 245-259.	2.8	1
338	Industrial Revolution 4.0 With a Focus on Food-Energy-Water Sectors. , 2022, , 2199-2210.		0
339	A Digital Twin Framework Embedded with POD and Neural Network for Flow Field Monitoring of Push-Plate Kiln. <i>Future Internet</i> , 2023, 15, 51.	2.4	2
340	Barriers to the Adoption of Digital Twin in the Construction Industry: A Literature Review. <i>Informatics</i> , 2023, 10, 14.	2.4	11
341	Fast prediction of turbine energy acquisition capacity under combined action of wave and current based on digital twin method. <i>Ships and Offshore Structures</i> , 2024, 19, 446-460.	0.9	1
342	Digital twin-enabled automated anomaly detection and bottleneck identification in complex manufacturing systems using a multi-agent approach. <i>Journal of Manufacturing Systems</i> , 2023, 67, 242-264.	7.6	12
343	Travelling the Metaverse: Potential Benefits and Main Challenges for Tourism Sectors and Research Applications. <i>Sustainability</i> , 2023, 15, 3348.	1.6	34
344	Holistic System Modelling and Analysis for Energy-Aware Production: An Integrated Framework. <i>Systems</i> , 2023, 11, 100.	1.2	1
345	Artificial Intelligence and Its Roles in the R&D of Vehicle Powertrain Products. , 0, , 6.		2
346	Internet of Behaviors: A Survey. <i>IEEE Internet of Things Journal</i> , 2023, 10, 11117-11134.	5.5	11
347	Digital Twin for Image-Based Particle Pollutant Matter Prognosis. <i>Journal of the Institution of Engineers (India): Series B</i> , 2023, 104, 351-357.	1.3	1
348	Multi-UAV Cooperative Search Based on Reinforcement Learning With a Digital Twin Driven Training Framework. <i>IEEE Transactions on Vehicular Technology</i> , 2023, 72, 8354-8368.	3.9	5
349	A data-driven digital twin framework for key performance indicators in CNC machining processes. <i>International Journal of Computer Integrated Manufacturing</i> , 2023, 36, 1823-1841.	2.9	3
350	Human Digital Twin for Personalized Elderly Type 2 Diabetes Management. <i>Journal of Clinical Medicine</i> , 2023, 12, 2094.	1.0	7
351	What You See Is (not) What You Get. , 2023, , .		4

#	ARTICLE	IF	CITATIONS
352	A joint model for hot-rolled strip quality in advance prediction. <i>Ironmaking and Steelmaking</i> , 0, , 1-10.	1.1	0
353	Class Abstraction and Upcasting for Self-evolving Digital Twin System. , 2023, , .		1
354	Research on the Interface of Sustainable Plant Factory Based on Digital Twin. <i>Sustainability</i> , 2023, 15, 5010.	1.6	1
355	Vehicle system dynamics in digital twin studies in rail and road domains. <i>Vehicle System Dynamics</i> , 2023, 61, 1737-1786.	2.2	4
356	Methodology for the Development of Virtual Representations within the Process Development Framework of Energy Plants: From Digital Model to Digital Predictive Twinâ€™A Review. <i>Energies</i> , 2023, 16, 2641.	1.6	5
357	Are digital twins improving urban-water systems efficiency and sustainable development goals?. <i>Urban Water Journal</i> , 0, , 1-13.	1.0	10
358	Research on Data Transfer Scheme of Virtual-Real Interactive in Five - Dimensional Digital Twin System. , 2022, , .		0
359	Digital Twins along the product lifecycle: A systematic literature review of applications in manufacturing. <i>Digital Twin</i> , 0, 3, 3.	0.0	0
360	A Literature Review on Digital Twins in Warehouses. <i>Procedia Computer Science</i> , 2023, 219, 370-377.	1.2	2
361	Digital twin application in heritage facilities management: systematic literature review and future development directions. <i>Engineering, Construction and Architectural Management</i> , 2023, ahead-of-print, .	1.8	6
362	A Digital Twin-Based Intelligent Robotic Measurement System for Freeform Surface Parts. <i>IEEE Transactions on Instrumentation and Measurement</i> , 2023, 72, 1-13.	2.4	2
363	Digital Twin: Is It Hype?. <i>Contributions To Management Science</i> , 2023, , 81-93.	0.4	0
364	Innovative Approach on Building Pathology Testing and Analysis. <i>Springer Tracts in Civil Engineering</i> , 2023, , 293-306.	0.3	0
365	Quality Monitoring of Resistance Spot Welding Based on a Digital Twin. <i>Metals</i> , 2023, 13, 697.	1.0	1
366	Digital twin forecasting of microwave ablation via fat quantification image-to-grid computational methods. , 2023, , .		1
367	A Review on Recent Trends and Applications of IoT in Additive Manufacturing. <i>Applied System Innovation</i> , 2023, 6, 50.	2.7	9
368	A General Contractorâ€™s Perspective on Construction Digital Twin: Implementation, Impacts and Challenges. <i>Buildings</i> , 2023, 13, 978.	1.4	2
369	Fog-Connected Digital Twin Implementation for Autonomous Greenhouse Management. , 2023, , 125-139.		0

#	ARTICLE	IF	CITATIONS
370	Digital Twin in Construction. , 2023, , 249-267.		0
371	Digital Twin and Manufacturing. , 2023, , 175-194.		1
372	Technology Management (TM) on Corporate Sustainability Performance (CSP): The Moderating Role of Total Quality Management (TQM). FIIB Business Review, 0, , 231971452311687.	2.2	3
373	Digital twin inception in the Era of industrial metaverse. , 0, 3, .		6
374	Human-Centric Digital Twins in Industry: A Comprehensive Review of Enabling Technologies and Implementation Strategies. Sensors, 2023, 23, 3938.	2.1	7
375	Recurrent Neural Network-Based Hybrid Modeling Method for Digital Twin of Boiler System in Coal-Fired Power Plant. Applied Sciences (Switzerland), 2023, 13, 4905.	1.3	1
376	Digital-Twins-Based Internet of Robotic Things for Remote Health Monitoring of COVID-19 Patients. IEEE Internet of Things Journal, 2023, 10, 16087-16098.	5.5	2
377	Digital Twin applications toward Industry 4.0: A Review. Cognitive Robotics, 2023, 3, 71-92.	3.2	24
378	Exploring the Fusion Potentials of Data Visualization and Data Analytics in the Process of Mining Digitalization. IEEE Access, 2023, 11, 40608-40628.	2.6	2
379	Towards a real-time capable hybrid-twin for gas-bearing supported high-speed turbocompressors. Energy, 2023, 275, 127385.	4.5	0
380	Digital twin of forged part to reduce distortion in machining. CIRP Annals - Manufacturing Technology, 2023, 72, 77-80.	1.7	0
381	Digital Twin as a Proxy for Industrial Cyber-Physical Systems. , 2023, , .		4
382	A systematic review on the current research of digital twin in automotive application. Internet of Things and Cyber-physical Systems, 2023, 3, 180-191.	4.6	4
385	Simulation: The Great Enabler?. Lecture Notes in Computer Science, 2023, , 312-325.	1.0	0
386	Towards 3D Virtual Dressing Room Based User-Friendly Metaverse Strategy. Studies in Big Data, 2023, , 27-42.	0.8	0
389	Multi-dimensional Optimization of a Visual Model for Measurement Assurance of Model-Specific Test Equipment that Integrates Data Flow Information Analysis. , 2023, , .		0
391	Optimal Energy Consumption Control in a Multi-Zone Building Based on a Hybrid Digital Twin. , 2023, , .		0
396	Digital Twin Platform Architecture Design to Support Smart Aeroptic Potato Cultivation in Indonesia. , 2023, , 92-99.		0

#	ARTICLE	IF	CITATIONS
399	Automated and Systematic Digital Twins Testing for Industrial Processes. , 2023, , .		1
402	Digital Twin-Based Fuel Consumption Model of Locomotive Diesel Engine. Lecture Notes in Networks and Systems, 2023, , 428-435.	0.5	0
404	Data and Data Management in the Context of Digital Twins. , 2023, , 253-278.		0
405	The Digital Twin in Action and Directions for the Future. , 2023, , 1201-1217.		1
406	Digital Twins of Complex Projects. , 2023, , 677-702.		0
407	Digital Twin and Education in Manufacturing. , 2023, , 1113-1134.		0
410	Safety and Security Requirements in AAS Integration: Use Case Demonstration. , 2023, , .		0
411	On the Use of Resilience Models as Digital Twins for Operational Support and In-time Decision Making. , 2023, , .		0
412	Properties and Characteristics of Digital Twins: Review of Industrial Definitions. SN Computer Science, 2023, 4, .	2.3	1
414	Design and Modelling of Digital Twin Technology to Improve Freight Logistics. Energy, Environment, and Sustainability, 2023, , 481-513.	0.6	0
415	Framework for Digital Supply Chains and Analysis of Impact of Challenges on Implementation of Digital Transformation. Energy, Environment, and Sustainability, 2023, , 453-479.	0.6	1
416	Conceptual approach to the formation of the digital twin of the Destination Earth (first glance). , 2023, , .		0
418	RobDT: AI-enhanced Digital Twin for Space Exploration Robotic Assets. Studies in Computational Intelligence, 2023, , 183-198.	0.7	1
422	Digital Twins in Industry 5.0: Challenges in Modeling and Communication. , 2023, , .		1
429	Federated Learning for Metaverse: A Survey. , 2023, , .		3
431	Secure Communication in Digital Twin-enabled Smart Grid Platform with Lightweight Authentication Scheme. Smart Innovation, Systems and Technologies, 2023, , 525-536.	0.5	0
432	Introduction "The Digital Twin of Humans. , 2023, , 3-10.		0
434	Leveraging Modelling and Simulation to address Manufacturing Challenges. , 2023, , .		0

#	ARTICLE	IF	CITATIONS
437	6G-BRICKS: Developing a Modern Experimentation Facility for Validation, Testing and Showcasing of 6G Breakthrough Technologies and Devices. IFIP Advances in Information and Communication Technology, 2023, , 17-31.	0.5	0
448	Digital twins for human-assistive robot teams in ambient assisted living. , 2023, , .		0
452	Towards Cultural Heritage Digital Twin: Concept, Characteristics, Framework and Applications. , 2023, , .		0
455	Modeling and Implementation of a 5G-Enabled Digital Twin of a Machine Tool Based on Physics Simulation. , 2023, , 90-110.		1
461	Towards a UHF RFID Electromagnetic Fingerprint-Based Web Resolver for Digital Twins. , 2023, , .		0
465	Validating Production Test Scenarios with Cyber-Physical System Design Models. , 2023, , .		1
467	A Merging of Digital Twin and Decision-Making Concepts for Industrial Maintenance. , 2023, , 353-360.		0
470	Enhancing the technological maturity of robot swarms. , 2023, , .		0
471	BDTwins: Blockchain-based Digital Twins Lifecycle Management. , 2022, , .		1
474	Implementation of zero liquid discharge policy in industrial water management. , 2023, , 199-228.		1
475	Building Performance Simulation. Palgrave Studies in Digital Business & Enabling Technologies, 2023, , 53-67.	1.3	0
478	Role of Digital Twin Technology in Automotive Sectors: An Overview. , 2023, , .		0
479	Survey on Digital Twins: from concepts to applications. , 2023, , .		0
481	Digital Twin for Automated Industrial Optimization: Intelligent Machine Selection via Process Modelling. , 2023, , .		0
483	Achieving Zero Defected Products in Diary 4.0 using Digital Twin and Machine Vision. , 2023, , .		2
485	Human-Centric Digital Twin Focused on "Gen-Ba" Knowledge: Conceptual Model and Examples by Smart Voice Messaging System. , 2023, , .		1
487	Enabling High-fidelity Modeling of Digital Twin for Hydraulic Systems: KP-PSO Based Parameter Identification. , 2023, , .		0
488	Merging Model-Based and Data-Driven Approaches for Resilient Systems Digital Twins Design. , 2023, , .		0

#	ARTICLE	IF	CITATIONS
489	Threat intelligence using Digital Twin honeypots in Cybersecurity. , 2023, , .		0
496	Translation of AI into oncology clinical practice. <i>Oncogene</i> , 2023, 42, 3089-3097.	2.6	7
501	Digital Factory for Product Customization: A Proposal for a Decentralized Production System. <i>Lecture Notes in Mechanical Engineering</i> , 2024, , 879-886.	0.3	0
502	Evolution of modified LSS 4.0 model for sustainable Indian textile industry: a narrative review. <i>International Journal on Interactive Design and Manufacturing</i> , 0, , .	1.3	0
507	Smart Manufacturing Using Internet of Things, Artificial Intelligence, and Digital Twin Technology. <i>Advances in Computational Intelligence and Robotics Book Series</i> , 2023, , 184-205.	0.4	0
508	A Digital Twin Framework for Virtual Re-Commissioning of Work-Drive Systems Using CAD-based Motion Co-Simulation. , 2023, , .		0
509	Blockchain-enabled Digital Twin Technology for Next-Generation Transportation Systems. , 2023, , .		2
510	Clever DAE. , 2023, , .		0
514	Digital Twin Application Methodology for the Improvement of Production and Service Systems. Application to Waste Management Processes. <i>Lecture Notes in Networks and Systems</i> , 2023, , 25-36.	0.5	0
515	Digital Twin and Extended Reality in Industrial Contexts: A Bibliometric Review. <i>Lecture Notes in Computer Science</i> , 2023, , 269-283.	1.0	0
520	Quality Assurance of Digital Twins: An Experience Report in the Automotive Industry. <i>Communications in Computer and Information Science</i> , 2023, , 15-29.	0.4	0
521	Digital Twins an Enabler of Digitalization in Supply Chain. <i>Environmental Footprints and Eco-design of Products and Processes</i> , 2024, , 169-183.	0.7	0
522	A Digital Reverse Logistics Twin for Improving Sustainability in Industry 5.0. <i>IFIP Advances in Information and Communication Technology</i> , 2023, , 273-286.	0.5	0
523	Capability Building Blocks for Digital Twin Development. <i>IFIP Advances in Information and Communication Technology</i> , 2023, , 154-168.	0.5	0
526	A digital twin model of hot rolling process based on CGAN. , 2023, , .		0
533	From Data to Decisions: A Method for Evaluating the Strategic Value of Digital Twins. , 2023, , .		0
539	Advanced Human-Computer Interaction Technology in Digital Twins. <i>Studies in Computational Intelligence</i> , 2023, , 99-123.	0.7	0
541	The Use of Simulation and Artificial Intelligence as a Decision Support Tool for Sustainable Production Lines. <i>Advances in Science and Technology</i> , 0, , .	0.2	0

#	ARTICLE	IF	CITATIONS
542	Exploring the Emergence of Digital Twins in the Construction Industry. , 2023, , 19-31.		0
548	Automated Integration of External Data into Digital Twins for Manufacturing Processes. , 2023, , .		0
551	Digitalizing Manual Processes Using Digital Twins and Product Lifecycle Management for Safe Human-Robot Interaction Scenarios. , 2023, , .		0
553	OPC-UA/MQTT-Based Multi M2M Protocol Architecture for Digital Twin Systems. Lecture Notes on Data Engineering and Communications Technologies, 2023, , 322-338.	0.5	0
556	Research on the Application of Digital Twin in Bridge Rotation Construction. , 2023, , .		0
557	Industry 4.0: Digital Twin's Industrial Applications. , 2023, , .		1
559	Joint Modeling of Multi-domain Digital Twins for Lithium Battery Pack. , 2023, , .		0
560	Digital Twin Development for a Quality Control Cell. , 2023, , .		0
562	CODIT 2023 Modeling of Smart Batteries for the Realization of a Digital Twin Prototype. , 2023, , .		0
564	A Survey on the Metaverse Aspects and Opportunities in Education. , 2023, , .		0
567	Application of human-machine interaction in digital twin system of industrial robot. AIP Conference Proceedings, 2023, , .	0.3	0
576	Remedy: Automated Design and Deployment of Hybrid Deep Learning-based Error Detectors. , 2023, , .		0
577	Energy Efficiency Optimization of a Wastewater Pumping Station Through IoT and AI: A Real-World Application of Digital Twins. , 2023, , .		1
578	Short-Term Prediction of Solar Photovoltaic Power Generation Using a Digital Twin. , 2023, , .		0
579	Digital Twin Simulations for Connected and Automated Vehicles: A Comprehensive Study. , 2023, , .		0
581	From Theory to Practice: A Systematic Review of Digital Twin Implementations Across Industry 4.0. , 2023, , .		0
586	Middleware for Digital Twins: A Systematic Mapping Study. , 2023, , .		0
588	Digital Twins Technologies. , 2024, , 27-74.		0

#	ARTICLE	IF	CITATIONS
589	Introduction to Digital Twin Technologies in Transportation Infrastructure Management (TIM). , 2024, , 1-25.		0
592	Image-Feature Parallel Compression for Indoor Surveillance Video. , 2023, , .		0
596	Digital Twin for Industrial Applications – A Literature Review. IFIP Advances in Information and Communication Technology, 2024, , 92-103.	0.5	0
602	Model-Based Systems Engineering in Smart Manufacturing - Future Trends Toward Sustainability. Lecture Notes in Networks and Systems, 2024, , 298-311.	0.5	0
605	Digital Twin Test Method for Autonomous Vehicles Based on PanoSim. , 0, , .		0
606	A Modeling Approach Supporting Digital Twin Engineering: Optimizing the Energy Consumption of Air Conditioning Facilities. , 2023, , .		0
613	Data-Driven Digital Twins for Power Estimations of a Solar Photovoltaic Plant. , 2023, , .		0
614	Cyber Security Issues in the Industrial Applications of Digital Twins. , 2023, , .		0
615	Digital Twin in Extended Reality Applications for Industry 4.0. Lecture Notes in Electrical Engineering, 2024, , 867-880.	0.3	0
621	Realizing On-Chip Digital Twin for Event Tracking in Squirrel Cage Induction Motors and Drives. , 2023, , .		0
627	Internet of Things and Digital Twin in Fire Safety Management. , 2024, , 335-361.		0
628	Modeling and simulation of shape memory nanocomposites. , 2024, , 255-270.		0
629	Data-driven optimization algorithms. , 2024, , 135-180.		0
632	Quadrotor Auto Trimming based on Deep Reinforcement Learning and Digital Twin. , 2023, , .		0
635	Deep Learning Enabling Digital Twin Applications in Production Scheduling: Case of Flexible Job Shop Manufacturing Environment. , 2023, , .		0
638	Strukturmodellbasierte Korrektur thermisch bedingter Fehler. , 2024, , 373-387.		0
643	Digital Twin Architecture for Autonomous Driving Validation and Verification. , 2023, , .		0
651	Employing Digital Twins in Operation and Maintenance Management of Transportation Systems. Lecture Notes in Intelligent Transportation and Infrastructure, 2024, , 67-76.	0.3	0

#	ARTICLE	IF	CITATIONS
662	SALab: Computer-Supported Social Arrangements Laboratory. , 2024, , 299-312.		0
663	A Systematic Review of Digital Twin as a Predictive Maintenance Approach for Existing Buildings in the UK. Proceedings E Report, 0, , 1206-1218.	0.0	0
664	A Systematic Review of Digital Twin as a Predictive Maintenance Approach for Existing Buildings in the UK. Proceedings E Report, 0, , 1206-1218.	0.0	0
665	Foundations of Blockchain and Digital Twins. Advances in Finance, Accounting, and Economics, 2024, , 20-48.	0.3	0
666	Applying 4.0 Technologies to Public Spaces. Exploring New Functions and Interactions in Savona University Campus. Lecture Notes in Civil Engineering, 2024, , 157-168.	0.3	0
668	Towards Sustainable Urban Development: Matera's Urban Digital Twin and Challenges in Data Integration. Lecture Notes in Civil Engineering, 2024, , 230-236.	0.3	0
673	Review: Emerging innovation of digital twin technology. AIP Conference Proceedings, 2024, , .	0.3	0
676	Digital Twins of Bridges: Characteristics of a Framework Leading to Practical Implementations. , 2024, , .		0
694	MAI: A Very Short History and the State of the Art. The International Library of Ethics, Law and Technology, 2024, , 23-53.	0.2	0
695	From Virtual Worlds to Real-World Impact: An Industrial Metaverse Survey. Lecture Notes in Networks and Systems, 2024, , 592-613.	0.5	0