Achim Menges

List of Publications by Year
in descending order

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74	1,825	304743	315739
papers	citations	22	38
		h-index	g-index

78	78	78	1169
all docs	docs citations	times ranked	citing authors

#	Article	IF	Citations
1	Meteorosensitive architecture: Biomimetic building skins based on materially embedded and hygroscopically enabled responsiveness. CAD Computer Aided Design, 2015, 60, 50-69.	2.7	141
2	3D-Printed Wood: Programming Hygroscopic Material Transformations. 3D Printing and Additive Manufacturing, 2015, 2, 106-116.	2.9	129
3	On-site autonomous construction robots: Towards unsupervised building. Automation in Construction, 2020, 119, 103312.	9.8	124
4	Toward a New Generation of Smart Biomimetic Actuators for Architecture. Advanced Materials, 2018, 30, e1703653.	21.0	108
5	Additive manufacturing of cellulose-based materials with continuous, multidirectional stiffness gradients. Science Advances, 2020, 6, eaay0929.	10.3	66
6	Flexible and transportable robotic timber construction platform â€“ TIM. Automation in Construction, 2020, 120, 103400.	9.8	65
7	Fibrous structures: An integrative approach to design computation, simulation and fabrication for lightweight, glass and carbon fibre composite structures in architecture based on biomimetic design principles. CAD Computer Aided Design, 2014, 52, 27-39.	2.7	62
8	4D pine scale: biomimetic 4D printed autonomous scale and flap structures capable of multi-phase movement. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2020, 378, 20190445.	3.4	59
9	Biomimetic design processes in architecture: morphogenetic and evolutionary computational design. Bioinspiration and Biomimetics, 2012, 7, 015003.	2.9	49
10	Material Computation: Higher Integration in Morphogenetic Design. Architectural Design, 2012, 82, 14-21.	0.1	48
11	Hygroscopically actuated wood elements for weather responsive and self-forming building parts â€“ Facilitating upscaling and complex shape changes. Construction and Building Materials, 2018, 165, 782-791.	7.2	46
12	Advanced Timber Construction Industry: A Review of 350 Multi-Storey Timber Projects from 2000â€“2021. Buildings, 2022, 12, 404.	3.1	43
13	Implementation of an Augmented Reality AR Workflow for Human Robot Collaboration in Timber Prefabrication. , 2019, , .		41
14	Towards digital automation flexibility in large-scale timber construction: integrative robotic prefabrication and co-design of the BUGA Wood Pavilion. Construction Robotics, 2020, 4, 187-204.	2.2	39
15	From Nature to Fabrication: Biomimetic Design Principles for the Production of Complex Spatial Structures. International Journal of Space Structures, 2013, 28, 27-39.	1.0	37
16	Towards an aggregate architecture: designed granular systems as programmable matter in architecture. Granular Matter, 2016, 18, 1.	2.2	34
17	Advancing Wood Architecture. , 0, , .		32
18	Material computationâ€”4D timber construction: Towards building-scale hygroscopic actuated, self-constructing timber surfaces. International Journal of Architectural Computing, 2016, 14, 49-62.	1.5	31

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19	Robotic coreless filament winding for hyperboloid tubular composite components in construction. Automation in Construction, 2021, 126, 103649.	9.8	30
20	Programming sequential motion steps in 4D-printed hygromorphs by architected mesostructure and differential hygro-responsiveness. Bioinspiration and Biomimetics, 2021, 16, 055002.	2.9	30
21	Analysis of hygroscopic self-shaping wood at large scale for curved mass timber structures. Science Advances, 2019, 5, eaax1311.	10.3	29
22	Plant Movements as Concept Generators for the Development of Biomimetic Compliant Mechanisms. Integrative and Comparative Biology, 2020, 60, 886-895.	2.0	29
23	Bioâ€Inspired Motion Mechanisms: Computational Design and Material Programming of Selfâ€Adjusting 4Dâ€Printed Wearable Systems. Advanced Science, 2021, 8, 2100411.	11.2	27
24	Performative Wood: Physically Programming the Responsive Architecture of the HygroScope and HygroSkin Projects. Architectural Design, 2015, 85, 66-73.	0.1	23
25	An interactive agent-based framework for materialization-informed architectural design. Swarm Intelligence, 2018, 12, 155-186.	2.2	23
26	Morphospaces of Robotic Fabrication. , 2013, , 28-47.		21
27	Integrative computational design and construction: Rethinking architecture digitally. Civil Engineering Design, 2021, 3, 123-135.	1.9	21
28	Packings of 3D stars: stability and structure. Granular Matter, 2016, 18, 1.	2.2	20
29	Development of an Impregnation End-Effector with Fiber Tension Monitoring for Robotic Coreless Filament Winding. Processes, 2021, 9, 806.	2.8	20
30	Spatial winding: cooperative heterogeneous multi-robot system for fibrous structures. Construction Robotics, 2020, 4, 205-215.	2.2	18
31	Core-Less Filament Winding. , 2014, , 275-289.		18
32	Aggregate Structures: Material and Machine Computation of Designed Granular Substances. Architectural Design, 2012, 82, 74-81.	0.1	17
33	Additive Manufacturing of Large Coreless Filament Wound Composite Elements for Building Construction. 3D Printing and Additive Manufacturing, 2022, 9, 145-160.	2.9	17
34	Self-shaping Curved Folding:. , 2020, , .		17
35	Robust Task and Motion Planning for Long-Horizon Architectural Construction Planning. , 2020, , .		15
36	Computational co-design framework for coreless wound fibreâ€“polymer composite structures. Journal of Computational Design and Engineering, 2022, 9, 310-329.	3.1	14

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37	ICD/ITKE Research Pavilion 2013â€14: Modular Coreless Filament Winding Based on Beetle Elytra. Architectural Design, 2015, 85, 54-59.	0.1	13
38	A novel rapid additive manufacturing concept for architectural composite shell construction inspired by the shell formation in land snails. Bioinspiration and Biomimetics, 2018, 13, 026010.	2.9	13
39	Physically distributed multi-robot coordination and collaboration in construction. Construction Robotics, 2020, 4, 3-18.	2.2	12
40	Computational analysis of hygromorphic self-shaping wood gridshell structures. Royal Society Open Science, 2020, 7, 192210.	2.4	12
41	Autonomous anchoring for robotic construction. Automation in Construction, 2020, 120, 103391.	9.8	12
42	Multifunctional Mesostructures: DesignÂandÂMaterialÂProgrammingÂforÂ4D-printing. , 2020, , .		12
43	Programming material compliance and actuation: hybrid additive fabrication of biocomposite structures for large-scale self-shaping. Bioinspiration and Biomimetics, 2021, 16, 055004.	2.9	11
44	ELYTRA FILAMENT PAVILION:. , 2017, , 224-231.		11
45	Development of a Material Design Space for 4D-Printed Bio-Inspired Hygroscopically Actuated Bilayer Structures with Unequal Effective Layer Widths. Biomimetics, 2021, 6, 58.	3.3	11
46	Granular Morphologies: Programming Material Behaviour with Designed Aggregates. Architectural Design, 2015, 85, 86-91.	0.1	10
47	Computational Material Culture. Architectural Design, 2016, 86, 76-83.	0.1	10
48	Distributed Fabrication: Cooperative Making with Larger Groups of Smaller Machines. Architectural Design, 2019, 89, 62-69.	0.1	9
49	Visualization for Architecture, Engineering, and Construction: Shaping the Future of Our Built World. IEEE Computer Graphics and Applications, 2022, 42, 10-20.	1.2	9
50	Michael Hensel; Frei Otto;. Architectural Design, 2006, 76, 78-87.	0.1	7
51	Designing architectural materials: from granular form to functional granular material. Bioinspiration and Biomimetics, 2021, 16, 065010.	2.9	7
52	Material Performance. Architectural Design, 2008, 78, 34-41.	0.1	6
53	Evolutionary structural and spatial adaptation of topologically differentiated tensile systems in architectural design. Artificial Intelligence for Engineering Design, Analysis and Manufacturing: AIEDAM, 2015, 29, 393-415.	1.1	6
54	Granular Construction: Designed Particles for Macroâ€Scale Architectural Structures. Architectural Design, 2017, 87, 88-93.	0.1	6

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55	Urbach Tower: Integrative structural design of a lightweight structure made of self-shaped curved cross-laminated timber. Structures, 2021, 33, 3667-3681.	3.6	6
56	Programming Material Intelligence: An Additive Fabrication Strategy for Self-shaping Biohybrid Components. Lecture Notes in Computer Science, 2020, , 36-45.	1.3	6
57	BUGA FIBRE PAVILION:. , 2020, , 234-243.		6
58	Autonomous robotic additive manufacturing through distributed modelâ€free deep reinforcement learning in computational design environments. Construction Robotics, 2022, 6, 15-37.	2.2	6
59	Aggregates. Architectural Design, 2008, 78, 80-87.	0.1	5
60	Patterns in Performance-Orientated Design: An Approach towards Pattern Recognition, Generation and Instrumentalisation. Architectural Design, 2009, 79, 88-93.	0.1	5
61	Soft Office: a humanâ€“robot collaborative system for adaptive spatial configuration. Construction Robotics, 2021, 5, 23-33.	2.2	5
62	Leveraging Building Material as Part of the Inâ€Plane Robotic Kinematic System for Collective Construction. Advanced Science, 2022, 9, .	11.2	5
63	Manufacturing Performance. Architectural Design, 2008, 78, 42-47.	0.1	4
64	Bionisch-inspirierte Faserverbundstrukturen. Bautechnik, 2013, 90, 766-771.	0.1	4
65	Vibrational Collapse of Hexapod Packings. EPJ Web of Conferences, 2017, 140, 06011.	0.3	4
66	Biomimetic Actuators: Toward a New Generation of Smart Biomimetic Actuators for Architecture (Adv. Mater. 19/2018). Advanced Materials, 2018, 30, 1870135.	21.0	4
67	Construction robotics for designed granular materials: in situ construction with designed granular materials at full architectural scale using a cable-driven parallel robot. Construction Robotics, 2019, 3, 41-52.	2.2	4
68	Tailored Structures, Robotic Sewing of Wooden Shells. , 2019, , 405-420.		4
69	Learning Robotic Manipulation of Natural Materials With Variable Properties for Construction Tasks. IEEE Robotics and Automation Letters, 2022, 7, 5749-5756.	5.1	4
70	Synthesising Artificial Intelligence and Physical Performance. Architectural Design, 2022, 92, 94-99.	0.1	4
71	Membrane Spaces. Architectural Design, 2008, 78, 74-79.	0.1	3
72	Adaptive kinematic textile architecture. Construction Robotics, 2020, 4, 227-237.	2.2	2

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73	Netzwerk der Zukunft. Bautechnik, 2021, 98, 193-193.	0.1	0
74	Semi-automated braiding of complex, spatially branched FRP-structures. Composite Structures, 2021, 276, 114551.	5.8	0