Erik Winfree

List of Publications by Year
in descending order

106 papers	20,400 citations	41258 49 h-index	31759 101 g-index
117 all docs	117 docs citations	117 times ranked	8250 citing authors

#	Article	IF	Citations
1	Design and self-assembly of two-dimensional DNA crystals. Nature, 1998, 394, 539-544.	13.7	2,663
2	Enzyme-Free Nucleic Acid Logic Circuits. Science, 2006, 314, 1585-1588.	6.0	1,440
3	Scaling Up Digital Circuit Computation with DNA Strand Displacement Cascades. Science, 2011, 332, 1196-1201.	6.0	1,294
4	Control of DNA Strand Displacement Kinetics Using Toehold Exchange. Journal of the American Chemical Society, 2009, 131, 17303-17314.	6.6	1,239
5	Engineering Entropy-Driven Reactions and Networks Catalyzed by DNA. Science, 2007, 318, 1121-1125.	6.0	1,022
6	Neural network computation with DNA strand displacement cascades. Nature, 2011, 475, 368-372.	13.7	931
7	Molecular robots guided by prescriptive landscapes. Nature, 2010, 465, 206-210.	13.7	843
8	Algorithmic Self-Assembly of DNA Sierpinski Triangles. PLoS Biology, 2004, 2, e424.	2.6	696
9	DNA as a universal substrate for chemical kinetics. Proceedings of the National Academy of Sciences of the United States of America, 2010, 107, 5393-5398.	3.3	649
10	Construction, Analysis, Ligation, and Self-Assembly of DNA Triple Crossover Complexes. Journal of the American Chemical Society, 2000, 122, 1848-1860.	6.6	644
11	Self-assembly of carbon nanotubes into two-dimensional geometries using DNA origami templates. Nature Nanotechnology, 2010, 5, 61-66.	15.6	567
12	Design and Characterization of Programmable DNA Nanotubes. Journal of the American Chemical Society, 2004, 126, 16344-16352.	6.6	454
13	A cargo-sorting DNA robot. Science, 2017, 357, .	6.0	426
14	On the biophysics and kinetics of toehold-mediated DNA strand displacement. Nucleic Acids Research, 2013, 41, 10641-10658.	6.5	423
15	An autonomous polymerization motor powered by DNA hybridization. Nature Nanotechnology, 2007, 2, 490-494.	15.6	303
16	Thermodynamic Analysis of Interacting Nucleic Acid Strands. SIAM Review, 2007, 49, 65-88.	4.2	297
17	Construction of an in vitro bistable circuit from synthetic transcriptional switches. Molecular Systems Biology, 2006, 2, 68.	3.2	287
18	Enzyme-free nucleic acid dynamical systems. Science, 2017, 358, .	6.0	274

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19	Synthetic in vitro transcriptional oscillators. Molecular Systems Biology, 2011, 7, 465.	3.2	271
20	The program-size complexity of self-assembled squares (extended abstract). , 2000, , .		259
21	An information-bearing seed for nucleating algorithmic self-assembly. Proceedings of the National Academy of Sciences of the United States of America, 2009, 106, 6054-6059.	3.3	235
22	A simple DNA gate motif for synthesizing large-scale circuits. Journal of the Royal Society Interface, 2011, 8, 1281-1297.	1.5	210
23	Timing molecular motion and production with a synthetic transcriptional clock. Proceedings of the National Academy of Sciences of the United States of America, 2011, 108, E784-93.	3.3	208
24	Protein Design is NP-hard. Protein Engineering, Design and Selection, 2002, 15, 779-782.	1.0	205
25	Computation with finite stochastic chemical reaction networks. Natural Computing, 2008, 7, 615-633.	1.8	201
26	Diversity in the dynamical behaviour of a compartmentalized programmable biochemical oscillator. Nature Chemistry, 2014, 6, 295-302.	6.6	201
27	Diverse and robust molecular algorithms using reprogrammable DNA self-assembly. Nature, 2019, 567, 366-372.	13.7	198
28	Two Computational Primitives for Algorithmic Self-Assembly:Â Copying and Counting. Nano Letters, 2005, 5, 2586-2592.	4.5	197
29	Complexity of Selfâ€Assembled Shapes. SIAM Journal on Computing, 2007, 36, 1544-1569.	0.8	189
30	Integrating DNA strand-displacement circuitry with DNA tile self-assembly. Nature Communications, 2013, 4, 1965.	5.8	183
31	Paradigms for computational nucleic acid design. Nucleic Acids Research, 2004, 32, 1392-1403.	6.5	181
32	Toward Reliable Algorithmic Self-Assembly of DNA Tiles: A Fixed-Width Cellular Automaton Pattern. Nano Letters, 2008, 8, 1791-1797.	4.5	180
33	A Sticker-Based Model for DNA Computation. Journal of Computational Biology, 1998, 5, 615-629.	0.8	170
34	Synthesis of crystals with a programmable kinetic barrier to nucleation. Proceedings of the National Academy of Sciences of the United States of America, 2007, 104, 15236-15241.	3.3	168
35	Catalyzed Relaxation of a Metastable DNA Fuel. Journal of the American Chemical Society, 2006, 128, 12211-12220.	6.6	164
36	Proofreading Tile Sets: Error Correction for Algorithmic Self-Assembly. Lecture Notes in Computer Science, 2004, , 126-144.	1.0	129

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37	On the computational power of DNA annealing and ligation. DIMACS Series in Discrete Mathematics and Theoretical Computer Science, 1996, , 199-221.	0.0	126
38	Universal computation via self-assembly of DNA: Some theory and experiments. DIMACS Series in Discrete Mathematics and Theoretical Computer Science, 1998, , 191-213.	0.0	122
39	Robust self-replication of combinatorial information via crystal growth and scission. Proceedings of the National Academy of Sciences of the United States of America, 2012, 109, 6405-6410.	3.3	107
40	On Applying Molecular Computation to the Data Encryption Standard. Journal of Computational Biology, 1999, 6, 53-63.	0.8	102
41	Robustness and modularity properties of a non-covalent DNA catalytic reaction. Nucleic Acids Research, 2010, 38, 4182-4197.	6.5	95
42	Effective design principles for leakless strand displacement systems. Proceedings of the National Academy of Sciences of the United States of America, 2018, 115, E12182-E12191.	3.3	94
43	Algorithmic Self-Assembly of DNA: Theoretical Motivations and 2D Assembly Experiments. Journal of Biomolecular Structure and Dynamics, 2000, 17, 263-270.	2.0	92
44	Programmability ofÂChemical Reaction Networks. Natural Computing Series, 2009, , 543-584.	2.2	83
45	Efficient Turing-Universal Computation with DNA Polymers. Lecture Notes in Computer Science, 2011, , 123-140.	1.0	80
46	Physical principles for DNA tile self-assembly. Chemical Society Reviews, 2017, 46, 3808-3829.	18.7	71
47	Algorithmic Self-Assembly of DNA. , 2006, , .		70
48	Active self-assembly of algorithmic shapes and patterns in polylogarithmic time. , 2013, , .		70
49	Self-Assembled Circuit Patterns. Lecture Notes in Computer Science, 2004, , 91-107.	1.0	67
50	Dynamic Allosteric Control of Noncovalent DNA Catalysis Reactions. Journal of the American Chemical Society, 2008, 130, 13921-13926.	6.6	67
51	Reducing Facet Nucleation during Algorithmic Self-Assembly. Nano Letters, 2007, 7, 2913-2919.	4.5	61
52	A Simple DNA Gate Motif for Synthesizing Large-Scale Circuits. Lecture Notes in Computer Science, 2009, , 70-89.	1.0	58
53	Self-healing Tile Sets. , 2006, , 55-78.		55
54	Ensemble Bayesian Analysis of Bistability in a Synthetic Transcriptional Switch. ACS Synthetic Biology, 2012, 1, 299-316.	1.9	53

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55	Programmable Control of Nucleation for Algorithmic Self-Assembly. SIAM Journal on Computing, 2010, 39, 1581-1616.	0.8	52
56	Leakless DNA Strand Displacement Systems. Lecture Notes in Computer Science, 2015, , 133-153.	1.0	50
57	Thermodynamics and kinetics of DNA nanotube polymerization from single-filament measurements. Chemical Science, 2015, 6, 2252-2267.	3.7	39
58	Experimental progress in computation by self-assembly of DNA tilings. DIMACS Series in Discrete Mathematics and Theoretical Computer Science, 2000, , 123-140.	0.0	38
59	Parallel and Scalable Computation and Spatial Dynamics with DNA-Based Chemical Reaction Networks on a Surface. Lecture Notes in Computer Science, 2014, , 114-131.	1.0	37
60	Organizing centers in a cellular excitable medium. Physica D: Nonlinear Phenomena, 1985, 17, 109-115.	1.3	36
61	Programmable Control of Nucleation for Algorithmic Self-assembly. Lecture Notes in Computer Science, 2005, , 319-328.	1.0	35
62	Error suppression mechanisms for DNA tile self-assembly and their simulation. Natural Computing, 2009, 8, 589-612.	1.8	35
63	DNA as a Universal Substrate for Chemical Kinetics. Lecture Notes in Computer Science, 2009, , 57-69.	1.0	34
64	Complexity of Compact Proofreading for Self-assembled Patterns. Lecture Notes in Computer Science, 2006, , 305-324.	1.0	33
65	Stochastic Simulation of the Kinetics of Multiple Interacting Nucleic Acid Strands. Lecture Notes in Computer Science, 2015, , 194-211.	1.0	31
66	Direct Atomic Force Microscopy Observation of DNA Tile Crystal Growth at the Single-Molecule Level. Journal of the American Chemical Society, 2012, 134, 10485-10492.	6.6	28
67	Complexity of Self-assembled Shapes. Lecture Notes in Computer Science, 2005, , 344-354.	1.0	26
68	A sticker based model for DNA computation. DIMACS Series in Discrete Mathematics and Theoretical Computer Science, 1998, , 1-29.	0.0	26
69	String tile models for DNA computing by self-assembly. Lecture Notes in Computer Science, 2001, , 63-88.	1.0	23
70	The computational power of Benenson automata. Theoretical Computer Science, 2005, 344, 279-297.	0.5	23
71	A General-Purpose CRN-to-DSD Compiler with Formal Verification, Optimization, and Simulation Capabilities. Lecture Notes in Computer Science, 2017, , 232-248.	1.0	22
72	Combining self-healing and proofreading in self-assembly. Natural Computing, 2008, 7, 203-218.	1.8	21

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73	Programming and simulating chemical reaction networks on a surface. Journal of the Royal Society Interface, 2020, 17, 20190790.	1.5	21
74	Chemical Boltzmann Machines. Lecture Notes in Computer Science, 2017, , 210-231.	1.0	21
75	Determining hydrodynamic forces in bursting bubbles using DNA nanotube mechanics. Proceedings of the National Academy of Sciences of the United States of America, 2015, 112, E6086-E6095.	3.3	20
76	Self-replication and Evolution of DNA Crystals. Lecture Notes in Computer Science, 2005, , 734-743.	1.0	19
77	A domain-level DNA strand displacement reaction enumerator allowing arbitrary non-pseudoknotted secondary structures. Journal of the Royal Society Interface, 2020, 17, 20190866.	1.5	18
78	On the Reduction of Errors in DNA Computation. Journal of Computational Biology, 1999, 6, 65-75.	0.8	17
79	One Dimensional Boundaries for DNA Tile Self-Assembly. Lecture Notes in Computer Science, 2004, , 108-125.	1.0	17
80	DNA Sticky End Design and Assignment for Robust Algorithmic Self-assembly. Lecture Notes in Computer Science, 2013, , 61-75.	1.0	15
81	Complexity of restricted and unrestricted models of molecular computation. DIMACS Series in Discrete Mathematics and Theoretical Computer Science, 1996, , 187-198.	0.0	15
82	Verifying chemical reaction network implementations: A bisimulation approach. Theoretical Computer Science, 2019, 765, 3-46.	0.5	14
83	Two Dimensions and Two States in DNA Nanotechnology. Journal of Biomolecular Structure and Dynamics, 2000, 17, 253-262.	2.0	13
84	Automated sequence-level analysis of kinetics and thermodynamics for domain-level DNA strand-displacement systems. Journal of the Royal Society Interface, 2018, 15, 20180107.	1.5	13
85	How crystals that sense and respond to their environments could evolve. Natural Computing, 2008, 7, 219-237.	1.8	12
86	Universal Computation and Optimal Construction in the Chemical Reaction Network-Controlled Tile Assembly Model. Lecture Notes in Computer Science, 2015, , 34-54.	1.0	12
87	DNA Hybridization Catalysts and Catalyst Circuits. Lecture Notes in Computer Science, 2005, , 329-343.	1.0	11
88	Verifying chemical reaction network implementations: A pathway decomposition approach. Theoretical Computer Science, 2019, 765, 67-96.	0.5	11
89	On applying molecular computation to the data encryption standard. DIMACS Series in Discrete Mathematics and Theoretical Computer Science, 1998, , 31-44.	0.0	11
90	Increasing Redundancy Exponentially Reduces Error Rates during Algorithmic Self-Assembly. ACS Nano, 2015, 9, 5760-5771.	7.3	10

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91	Inferring Parameters for an Elementary Step Model of DNA Structure Kinetics with Locally Context-Dependent Arrhenius Rates. Lecture Notes in Computer Science, 2017, , 172-187.	1.0	7
92	Stochastic chemical reaction networks for robustly approximating arbitrary probability distributions. Theoretical Computer Science, 2020, 801, 64-95.	0.5	7
93	Time Complexity of Computation and Construction in the Chemical Reaction Network-Controlled Tile Assembly Model. Lecture Notes in Computer Science, 2016, , 165-182.	1.0	6
94	Error correction in DNA computing: Misclassification and strand loss. DIMACS Series in Discrete Mathematics and Theoretical Computer Science, 2000, , 49-63.	0.0	6
95	Toward molecular programming with DNA. Operating Systems Review (ACM), 2008, 42, 1-1.	1.5	5
96	Chemical Reaction Networks and Stochastic Local Search. Lecture Notes in Computer Science, 2019, , 1-20.	1.0	4
97	Verifying Chemical Reaction Network Implementations: A Bisimulation Approach. Lecture Notes in Computer Science, 2016, , 114-134.	1.0	3
98	Toward De Novo Recapitulation of Cytoskeleton Dynamics with DNA Nanotubes. Biophysical Journal, 2010, 98, 556a-557a.	0.2	2
99	Efficient Parameter Estimation for DNA Kinetics Modeled as Continuous-Time Markov Chains. Lecture Notes in Computer Science, 2019, , 80-99.	1.0	2
100	Optimizing Tile Set Size While Preserving Proofreading with a DNA Self-assembly Compiler. Lecture Notes in Computer Science, 2018, , 37-54.	1.0	1
101	Toward molecular programming with DNA. , 2008, , .		1
102	Toward molecular programming with DNA. Computer Architecture News, 2008, 36, 1-1.	2.5	1
103	Toward molecular programming with DNA. ACM SIGPLAN Notices, 2008, 43, 1-1.	0.2	0
104	Simple evolution of complex crystal species. Natural Computing, 2012, 11, 187-197.	1.8	0
105	Reversible Computation Using Swap Reactions on a Surface. Lecture Notes in Computer Science, 2019, , 174-196.	1.0	0
106	Verifying polymer reaction networks using bisimulation. Theoretical Computer Science, 2020, 843, 84-114.	0.5	0