

Timothy W Simpson

List of Publications by Year in descending order

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156
papers

8,817
citations

76196

40
h-index

51492

86
g-index

160
all docs

160
docs citations

160
times ranked

4037
citing authors

#	ARTICLE	IF	CITATIONS
1	Kriging Models for Global Approximation in Simulation-Based Multidisciplinary Design Optimization. AIAA Journal, 2001, 39, 2233-2241.	1.5	921
2	Use of Kriging Models to Approximate Deterministic Computer Models. AIAA Journal, 2005, 43, 853-863.	1.5	695
3	Product family design and platform-based product development: a state-of-the-art review. Journal of Intelligent Manufacturing, 2007, 18, 5-29.	4.4	651
4	Product platform design: method and application. Research in Engineering Design - Theory, Applications, and Concurrent Engineering, 2001, 13, 2-22.	1.2	467
5	Product platform design and customization: Status and promise. Artificial Intelligence for Engineering Design, Analysis and Manufacturing: AIEDAM, 2004, 18, 3-20.	0.7	436
6	Special Section on Multidisciplinary Design Optimization: Metamodeling in Multidisciplinary Design Optimization: How Far Have We Really Come?. AIAA Journal, 2014, 52, 670-690.	1.5	314
7	Approximation methods in multidisciplinary analysis and optimization: a panel discussion. Structural and Multidisciplinary Optimization, 2004, 27, 302.	1.7	296
8	Design and Analysis of Computer Experiments in Multidisciplinary Design Optimization: A Review of How Far We Have Come - Or Not. , 2008, , .		191
9	A Variation-Based Method for Product Family Design. Engineering Optimization, 2002, 34, 65-81.	1.5	169
10	Commonality indices for product family design: a detailed comparison. Journal of Engineering Design, 2006, 17, 99-119.	1.1	152
11	A market-driven approach to product family design. International Journal of Production Research, 2009, 47, 71-104.	4.9	143
12	Multidisciplinary Robust Design Optimization of an Internal Combustion Engine. Journal of Mechanical Design, Transactions of the ASME, 2003, 125, 124-130.	1.7	142
13	Update strategies for kriging models used in variable fidelity optimization. Structural and Multidisciplinary Optimization, 2006, 32, 287-298.	1.7	134
14	Efficient Pareto Frontier Exploration using Surrogate Approximations. Optimization and Engineering, 2001, 2, 31-50.	1.3	127
15	Assessing Variable Levels of Platform Commonality Within a Product Family Using a Multiobjective Genetic Algorithm. Concurrent Engineering Research and Applications, 2004, 12, 119-129.	2.0	123
16	Effective Product Family Design Using Physical Programming. Engineering Optimization, 2002, 34, 245-261.	1.5	118
17	Fuzzy clustering based hierarchical metamodeling for design space reduction and optimization. Engineering Optimization, 2004, 36, 313-335.	1.5	115
18	Introduction of a Product Family Penalty Function Using Physical Programming. Journal of Mechanical Design, Transactions of the ASME, 2002, 124, 164-172.	1.7	114

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19	Multidisciplinary Design Optimization for Complex Engineered Systems: Report From a National Science Foundation Workshop. Journal of Mechanical Design, Transactions of the ASME, 2011, 133, .	1.7	111
20	Balancing Commonality and Performance within the Concurrent Design of Multiple Products in a Product Family. Concurrent Engineering Research and Applications, 2001, 9, 177-190.	2.0	99
21	Many objective visual analytics: rethinking the design of complex engineered systems. Structural and Multidisciplinary Optimization, 2013, 48, 201-219.	1.7	98
22	Global Views on Modular Design Research: Linking Alternative Methods to Support Modular Product Family Concept Development. Journal of Mechanical Design, Transactions of the ASME, 2016, 138, .	1.7	94
23	A genetic algorithm based method for product family design optimization. Engineering Optimization, 2003, 35, 1-18.	1.5	92
24	A Methodology for Product Family Ontology Development Using Formal Concept Analysis and Web Ontology Language. Journal of Computing and Information Science in Engineering, 2006, 6, 103-113.	1.7	80
25	Product platform design to improve commonality in custom products. Journal of Intelligent Manufacturing, 2003, 14, 541-556.	4.4	78
26	Visual Steering Commands for Trade Space Exploration: User-Guided Sampling With Example. Journal of Computing and Information Science in Engineering, 2009, 9, .	1.7	78
27	From user requirements to commonality specifications: an integrated approach to product family design. Research in Engineering Design - Theory, Applications, and Concurrent Engineering, 2012, 23, 141-153.	1.2	74
28	A comprehensive metric for evaluating component commonality in a product family. Journal of Engineering Design, 2007, 18, 577-598.	1.1	71
29	A module-based service model for mass customization: service family design. IIE Transactions, 2010, 43, 153-163.	2.1	70
30	Toward an activity-based costing system for product families and product platforms in the early stages of development. International Journal of Production Research, 2008, 46, 99-130.	4.9	68
31	Robust Design of Families of Products With Production Modeling and Evaluation. Journal of Mechanical Design, Transactions of the ASME, 2001, 123, 183-190.	1.7	67
32	Dissolvable Metal Supports for 3D Direct Metal Printing. 3D Printing and Additive Manufacturing, 2016, 3, 90-97.	1.4	66
33	Metamodeling of Combined Discrete/Continuous Responses. AIAA Journal, 2001, 39, 1950-1959.	1.5	62
34	Multidimensional Visualization and Its Application to a Design by Shopping Paradigm. , 2002, , .		62
35	An efficient decomposed multiobjective genetic algorithm for solving the joint product platform selection and product family design problem with generalized commonality. Structural and Multidisciplinary Optimization, 2009, 39, 187-201.	1.7	62
36	A Product Platform Concept Exploration Method for Product Family Design. , 1999, , .		61

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37	The ARL Trade Space Visualizer: An Engineering Decision-Making Tool. , 2004, , .		60
38	Dissolvable Supports in Powder Bed Fusion-Printed Stainless Steel. 3D Printing and Additive Manufacturing, 2017, 4, 3-11.	1.4	59
39	Toward Metamodels for Composable and Reusable Additive Manufacturing Process Models. Journal of Manufacturing Science and Engineering, Transactions of the ASME, 2014, 136, .	1.3	54
40	A Study on the Use of Kriging Models to Approximate Deterministic Computer Models. , 2003, , 567.		53
41	Integrating linear physical programming within collaborative optimization for multiobjective multidisciplinary design optimization. Structural and Multidisciplinary Optimization, 2005, 29, 178-189.	1.7	53
42	Platform design variable identification for a product family using multi-objective particle swarm optimization. Research in Engineering Design - Theory, Applications, and Concurrent Engineering, 2014, 25, 95-108.	1.2	49
43	3D Design Using Generative Adversarial Networks and Physics-Based Validation. Journal of Mechanical Design, Transactions of the ASME, 2020, 142, .	1.7	49
44	Design Space Visualization and Its Application to a Design by Shopping Paradigm. , 2003, , 795.		47
45	Predicting Coherency Loss of γ' Precipitates in IN718 Superalloy. Metallurgical and Materials Transactions A: Physical Metallurgy and Materials Science, 2016, 47, 3235-3247.	1.1	46
46	New modularity indices for modularity assessment and clustering of product architecture. Journal of Engineering Design, 2017, 28, 1-22.	1.1	45
47	Product family design knowledge representation, aggregation, reuse, and analysis. Artificial Intelligence for Engineering Design, Analysis and Manufacturing: AIEDAM, 2007, 21, 173-192.	0.7	43
48	Product Platform Design and Optimization: Status and Promise. , 2003, , 131.		42
49	Toward a multi-agent information management infrastructure for product family planning and mass customisation. International Journal of Mass Customisation, 2005, 1, 134.	1.2	40
50	A cost-based methodology for evaluating product platform commonality sourcing decisions with two examples. International Journal of Production Research, 2007, 45, 5285-5308.	4.9	39
51	A Review of Recent Literature in Product Family Design and Platform-Based Product Development. , 2014, , 1-46.		39
52	Assessing and improving commonality and diversity within a product family. Research in Engineering Design - Theory, Applications, and Concurrent Engineering, 2009, 20, 241-253.	1.2	38
53	Service representation for capturing and reusing design knowledge in product and service families using object-oriented concepts and an ontology. Journal of Engineering Design, 2009, 20, 413-431.	1.1	38
54	SATISFYING RANGED SETS OF DESIGN REQUIREMENTS USING DESIGN CAPABILITY INDICES AS METRICS. Engineering Optimization, 1999, 31, 615-619.	1.5	36

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55	Platform-Based Design and Development: Current Trends and Needs in Industry. , 2006, , 801.		35
56	An Index-based Method to Manage the Tradeoff between Diversity and Commonality during Product Family Design. Concurrent Engineering Research and Applications, 2007, 15, 127-139.	2.0	35
57	An agent-based recommender system for developing customized families of products. Journal of Intelligent Manufacturing, 2009, 20, 649-659.	4.4	35
58	Diagnostic assessment of the borg MOEA for many-objective product family design problems. , 2012, , .		33
59	Mechanical properties of additively manufactured metal lattice structures: Data review and design interface. Additive Manufacturing, 2020, 35, 101301.	1.7	33
60	Visual Steering Commands and Test Problems to Support Research in Trade Space Exploration. , 2008, , .		31
61	A Dynamic Multiagent System Based on a Negotiation Mechanism for Product Family Design. IEEE Transactions on Automation Science and Engineering, 2008, 5, 234-244.	3.4	31
62	Six-Sigma Quality Management of Additive Manufacturing. Proceedings of the IEEE, 2021, 109, 347-376.	16.4	31
63	A methodology for knowledge discovery to support product family design. Annals of Operations Research, 2010, 174, 201-218.	2.6	30
64	Data Mining and Fuzzy Clustering to Support Product Family Design. , 2006, , 317.		29
65	Improving cost effectiveness in an existing product line using component product platforms. International Journal of Production Research, 2010, 48, 3299-3317.	4.9	29
66	A Monte Carlo Simulation of the Kriging Model. , 2004, , .		28
67	An integrated approach to product family redesign using commonality and variety metrics. Research in Engineering Design - Theory, Applications, and Concurrent Engineering, 2016, 27, 391-412.	1.2	28
68	Multi-Objective Design Optimization for Product Platform and Product Family Design Using Genetic Algorithms. , 2005, , 999.		27
69	Assessing the Impact of Graphical Design Interfaces on Design Efficiency and Effectiveness. Journal of Computing and Information Science in Engineering, 2003, 3, 144-154.	1.7	24
70	Assessing Variable Levels of Platform Commonality Within a Product Family Using a Multiobjective Genetic Algorithm. , 2002, , .		23
71	Exploring the Effects of Additive Manufacturing Education on Students' Engineering Design Process and its Outcomes. Journal of Mechanical Design, Transactions of the ASME, 2020, 142, .	1.7	23
72	A Multiattribute Utility Theory-Based Method for Product Line Selection. Journal of Mechanical Design, Transactions of the ASME, 2007, 129, 1179-1184.	1.7	22

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73	New product development practice application to an early-stage firm: the case of the PaperPro® StackMaster®, <i>c</i> . <i>Design Studies</i> , 2009, 30, 561-587.	1.9	22
74	Guidelines to minimize variation when estimating product line commonality through product family dissection. <i>Design Studies</i> , 2007, 28, 175-194.	1.9	20
75	Module-scale-based product platform planning. <i>Research in Engineering Design - Theory, Applications, and Concurrent Engineering</i> , 2009, 20, 129-141.	1.2	20
76	Preference Construction, Sequential Decision Making, and Trade Space Exploration. , 2013, , .		20
77	A method for using legacy data for metamodel-based design of large-scale systems. <i>Structural and Multidisciplinary Optimization</i> , 2004, 28, 146.	1.7	19
78	Impact of response delay and training on user performance with text-based and graphical user interfaces for engineering design. <i>Research in Engineering Design - Theory, Applications, and Concurrent Engineering</i> , 2007, 18, 49-65.	1.2	19
79	Using product family evaluation graphs in product family design. <i>International Journal of Production Research</i> , 2009, 47, 3559-3585.	4.9	19
80	A Model for Multi-Input Mechanical Advantage in Origami-Based Mechanisms. <i>Journal of Mechanisms and Robotics</i> , 2018, 10, .	1.5	19
81	A Comparison of Commonality Indices for Product Family Design. , 2004, , 169.		18
82	Additive creativity: investigating the use of design for additive manufacturing to encourage creativity in the engineering design industry. <i>International Journal of Design Creativity and Innovation</i> , 2020, 8, 198-222.	0.8	18
83	Robust Multiobjective Optimization Through Collaborative Optimization and Linear Physical Programming. , 2004, , .		17
84	Optimal Design of Product Families Using Selection-Integrated Optimization (SIO) Methodology. , 2006, , .		17
85	Ontology-based Process Map for Metal Additive Manufacturing. <i>Journal of Materials Engineering and Performance</i> , 2021, 30, 8784-8797.	1.2	17
86	Metamodel-Driven Design Optimization Using Integrative Graphical Design Interfaces: Results From a Job-Shop Manufacturing Simulation Experiment. <i>Journal of Computing and Information Science in Engineering</i> , 2005, 5, 8-17.	1.7	16
87	Update Strategies for Kriging Models for Use in Variable Fidelity Optimization. , 2005, , .		16
88	A Market-Driven Approach to the Design of Platform-Based Product Families. , 2006, , .		16
89	Examination of platform and differentiating elements in product family design. <i>Journal of Intelligent Manufacturing</i> , 2007, 18, 77-96.	4.4	16
90	Spatial Grammar-Based Recurrent Neural Network for Design Form and Behavior Optimization. <i>Journal of Mechanical Design, Transactions of the ASME</i> , 2019, 141, .	1.7	16

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91	Evaluation of a Graphical Design Interface for Design Space Visualization. , 2004, , .		15
92	Recommending a platform leveraging strategy based on the homogeneous or heterogeneous nature of a product line. Journal of Engineering Design, 2010, 21, 93-110.	1.1	15
93	Design as a sequential decision process. Structural and Multidisciplinary Optimization, 2018, 57, 305-324.	1.7	15
94	A Method to Improve Platform Leveraging in a Market Segmentation Grid for an Existing Product Line. Journal of Mechanical Design, Transactions of the ASME, 2008, 130, .	1.7	14
95	Applying the proximity compatibility and the control-display compatibility principles to engineering design interfaces. Human Factors and Ergonomics in Manufacturing, 2006, 16, 61-81.	1.4	13
96	A Decomposed Genetic Algorithm for Solving the Joint Product Family Optimization Problem. , 2007, , .		13
97	Achieving Functionally Graded Material Composition Through Bicontinuous Mesostructural Geometry in Material Extrusion Additive Manufacturing. Jom, 2018, 70, 413-418.	0.9	13
98	An Investigation of Surrogate Models for Efficient Performance-Based Decoding of 3D Point Clouds. Journal of Mechanical Design, Transactions of the ASME, 2019, 141, .	1.7	13
99	Evaluating the Use of Digital Product Repositories to Enhance Product Dissection Activities in the Classroom. Journal of Computing and Information Science in Engineering, 2009, 9, .	1.7	12
100	Design as a Sequential Decision Process: A Method for Reducing Design Set Space Using Models to Bound Objectives. , 2015, , .		12
101	Assessment of anisotropic mechanical properties of a 3D printed carbon whisker reinforced composite. Advanced Composite Materials, 2019, 28, 545-560.	1.0	12
102	Many-Objective Evolutionary Optimisation and Visual Analytics for Product Family Design. , 2011, , 137-159.		12
103	A Methodology to Support Product Family Redesign Using Genetic Algorithm and Commonality Indices. , 2005, , 1009.		11
104	A Comprehensive Metric for Evaluating Component Commonality in a Product Family. , 2006, , 823.		11
105	Building a better ice scraper—a case in product platforms for the entrepreneur. Journal of Intelligent Manufacturing, 2007, 18, 159-170.	4.4	11
106	A Product Dissection-Based Methodology to Benchmark Product Family Design Alternatives. Journal of Mechanical Design, Transactions of the ASME, 2009, 131, .	1.7	11
107	A New Method for Evaluating Design Dependencies in Product Architectures. , 2012, , .		10
108	Glasses-type wearable computer displays: usability considerations examined with a 3D glasses case study. Ergonomics, 2018, 61, 670-681.	1.1	10

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109	Built to win? Exploring the role of competitive environments on students'™ creativity in design for additive manufacturing tasks. <i>Journal of Engineering Design</i> , 2020, 31, 574-604.	1.1	10
110	A Multi-Agent System for Modular Platform Design in a Dynamic Electronic Market Environment. , 2006, , .		10
111	Strategic Product Design for Multiple Global Markets. , 2012, , .		9
112	Fresh in My Mind! Investigating the effects of the order of presenting opportunistic and restrictive design for additive manufacturing content on students'™ creativity. <i>Journal of Engineering Design</i> , 2021, 32, 187-212.	1.1	9
113	Adding Value to Trade Space Exploration When Designing Complex Engineered Systems. <i>Systems Engineering</i> , 2017, 20, 131-146.	1.6	9
114	Graphical User Interfaces for Engineering Design: Impact of Response Delay and Training on User Performance. , 2004, , .		9
115	A Multi-Attribute Utility Theory-Based Approach to Product Line Consolidation and Selection. , 2006, , 441.		8
116	Linking 10 Years of Modular Design Research: Alternative Methods and Tool Chain Sequences to Support Product Platform Design. , 2013, , .		8
117	Quantifying tradeoffs to reduce the dimensionality of complex design optimization problems and expedite trade space exploration. <i>Structural and Multidisciplinary Optimization</i> , 2016, 54, 233-248.	1.7	8
118	Maximizing design potential: investigating the effects of utilizing opportunistic and restrictive design for additive manufacturing in rapid response solutions. <i>Rapid Prototyping Journal</i> , 2021, 27, 1161-1171.	1.6	8
119	Mastering manufacturing: exploring the influence of engineering designers'™ prior experience when using design for additive manufacturing. <i>Journal of Engineering Design</i> , 2022, 33, 366-387.	1.1	7
120	Graphical and text-based design interfaces for parameter design of an I-beam, desk lamp, aircraft wing, and job shop manufacturing system. <i>Engineering With Computers</i> , 2007, 23, 93-107.	3.5	6
121	A method to evaluate direct and indirect design dependencies between components in a product architecture. <i>Research in Engineering Design - Theory, Applications, and Concurrent Engineering</i> , 2018, 29, 507-530.	1.2	6
122	Metamodel-Driven Interfaces for Engineering Design: Impact of Delay and Problem Size on User Performance. , 2005, , .		5
123	Full Field Strain Measurement of Material Extrusion Additive Manufacturing Parts with Solid and Sparse Infill Geometries. <i>Jom</i> , 2019, 71, 871-879.	0.9	5
124	Defining Modules for Platforms: An Overview of the Architecting Process. , 2014, , 323-341.		5
125	Using Product Dissection to Integrate Product Family Design Research Into the Classroom and Improve Students'™ Understanding of Platform Commonality. , 2005, , 375.		4
126	Design and manufacturability data on additively manufactured solutions for COVID-19. <i>Data in Brief</i> , 2021, 36, 107012.	0.5	4

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127	Redesigning Product Families using Heuristics and Shared Ontological Component Information. , 2006, , .		3
128	A Product Family Optimization Approach Using Multidimensional Data Visualization. , 2010, , .		3
129	A sparsity preserving genetic algorithm for extracting diverse functional 3D designs from deep generative neural networks. Design Science, 2020, 6, .	1.1	3
130	Strategic Module Sharing for Customized Service Family Design using a Bayesian Game. , 2007, , .		2
131	Validating the Generational Variety Index (GVI) Through Product Family Optimization: A Preliminary Study. , 2010, , .		2
132	Visualization of System Decomposition in a Value-Based Framework. , 2014, , .		2
133	Product Family and Product Platform Benchmarking With Commonality and Variety Indices. , 2017, , .		2
134	Value-Driven Design Using Discipline-Based Decomposition for a Family of Front-Loading Washing Machines. , 2017, , .		2
135	Part filtering methods for additive manufacturing: A detailed review and a novel process-agnostic method. Additive Manufacturing, 2021, 47, 102115.	1.7	2
136	Rapid Response! Investigating the Effects of Problem Definition on the Characteristics of Additively Manufactured Solutions for COVID-19. Journal of Mechanical Design, Transactions of the ASME, 2022, 144, .	1.7	2
137	A Method for Benchmarking Product Family Design Alternatives. , 2007, , 921.		1
138	Prototype implementation of a virtual product family through a web-based custom product specification system. International Journal of Mass Customisation, 2007, 2, 161.	1.2	1
139	Development of a Product Family Analysis Toolkit for Systematic Benchmarking. , 2010, , .		1
140	Effects of Over-the-Counter Medication Product Family Packaging Design on Knowledge Acquisition and Consumer Preferences. , 2014, , .		1
141	An Integrated Approach to Product Family Redesign Using Commonality and Variety Metrics. , 2015, , .		1
142	A Value-Driven Design Approach to Optimize a Family of Front-Loading Washing Machines. , 2016, , .		1
143	Product Family Redesign Using Additive Manufacturing. , 2018, , .		1
144	Towards a Knowledge Support System for Product Family Design. , 2009, , 297-318.		1

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145	Provide Relevant Knowledge to Specify Product Design Project Needs. , 2006, , .		0
146	A Method to Improve Platform Leveraging in a Market Segmentation Grid for an Existing Product Line. , 2006, , 863.		0
147	Improving Cost Effectiveness in an Existing Product Line Using Component Product Platforms. , 2008, , .		0
148	Using Visualization Tools to Create Kriging Models. , 2010, , .		0
149	From User Requirements to Commonality Specifications: An Integrated Approach to Product Family Design. , 2010, , .		0
150	Problem Exploration With Many-Objective Visual Analytics. , 2016, , .		0
151	Multidisciplinary Analysis and Product Family Optimization of Front-Loading Washing Machines. , 2016, , .		0
152	Value-driven design for product families: a new approach for estimating value and a novel industry case study. Structural and Multidisciplinary Optimization, 2021, 63, 2009-2033.	1.7	0
153	Market-Based Strategic Platform Design for a Product Family Using a Bayesian Game. , 2009, , 338-356.		0
154	Product Family Commonality Selection Using Optimization and Interactive Visualization. , 2014, , 449-471.		0
155	Application of the Generational Variety Index: A Retrospective Study of iPhone Evolution. , 2014, , 737-751.		0
156	Solving the Joint Product Platform Selection and Product Family Design Problem: An Efficient Decomposed Multiobjective Genetic Algorithm with Generalized Commonality. , 2014, , 271-294.		0