

Curriculum Vitae: Scott M. Summers

CONTACT	Computer Science Department University of Wisconsin Oshkosh 800 Algoma Boulevard Oshkosh, WI 54901 USA	Office: +1-920-424-1324 Email: summerss@uwosh.edu
ACADEMIC POSITIONS	University of Wisconsin Oshkosh, Oshkosh Campus Oshkosh, WI USA	
	Computer Science Department	
	▷ Associate professor of Computer Science	9/2019–present
	▷ Assistant professor of Computer Science	9/2013–5/2019
	University of Wisconsin—Platteville Platteville, WI USA	
	Department of Computer Science and Software Engineering	
	▷ Assistant professor of Computer Science	8/2010–7/2013
EDUCATION	Iowa State University Ames, IA USA	
	Ph.D., Computer Science	5/2007-5/2010
	▷ Dissertation title: <i>Universality in algorithmic self-assembly</i>	
	▷ Advisors: James I. Lathrop and Jack H. Lutz	
	▷ Area: algorithms, theoretical Computer Science	
	Iowa State University Ames, IA USA	
	M.S., Computer Science	8/2004-5/2007
	▷ Thesis title: <i>Strict self-assembly of discrete Sierpinski triangles</i>	
	▷ Advisors: James I. Lathrop and Jack H. Lutz	
	▷ Area: algorithms, theoretical Computer Science	
	University of Wisconsin—Green Bay Green Bay, WI USA	
	B.S., Computer Science	9/2000-5/2004
	▷ <i>Summa cum laude</i>	
	▷ Minor: Mathematics	
GRANTS	<i>New and Improved Bounds on the Tile Complexity of Uniquely Self-Assembling Thin Rectangles at Temperature-1 in 3D</i> , University of Wisconsin—Oshkosh undergraduate student/faculty collaborative research project, Summer 2020.	
	<i>Non-cooperative self-assembling algorithms</i> , University of Wisconsin—Oshkosh faculty professional development summer research grant FDR881, 2015.	
	<i>Twenty-ninth Bellairs Winter Workshop</i> , University of Wisconsin—Oshkosh off-campus professional development activity FDW853, 2014.	
	<i>College of Engineering, Mathematics and Science Recruitment and Retention Center</i> , \$899,888, National Science Foundation (NSF) Science, Technology, Engineering, and Mathematics	

Talent Expansion Program (STEP) grant, 2012–2017 (PI: Christina J. Curras, co-PIs: William B. Hudson, Tammy J. Salmon-Stephens and Scott M. Summers), NSF award #DUE-1161180

▷ I am neither currently funded by nor actively involved in this project.

TEACHING University of Wisconsin—Oshkosh
EXPERIENCE Oshkosh, WI USA

Instructor:

- ▷ Math 212: Discrete Mathematics
- ▷ Comp Sci 125: Web Site Development
- ▷ Comp Sci 142: Introduction to Computer Science and Programming
- ▷ Comp Sci 212: Discrete Structures
- ▷ Comp Sci 221: Object-Oriented Design and Programming I
- ▷ Comp Sci 251: Computer Architecture and Assembly Language
- ▷ Comp Sci 262: Object-Oriented Design and Programming II
- ▷ Comp Sci 271: Data Structures
- ▷ Comp Sci 310: Computer Organization and Design
- ▷ Comp Sci 321: Algorithms
- ▷ Comp Sci 350: Ethical Issues in Computing
- ▷ Comp Sci 391: Data Communications and Computer Networks
- ▷ Comp Sci 381: Theory of Computing
- ▷ Comp Sci 399/490: Computer Science Internship / Practicum
- ▷ Comp Sci 480: Special Topics in Computer Science: Algorithmic Self-Assembly

University of Wisconsin—Platteville
Platteville, WI USA

Instructor:

- ▷ CS 1010: Introduction to Computer Science
- ▷ CS 1430: Programming in C++
- ▷ CS 2430: Object-Oriented Programming and Data Structures I
- ▷ CS 3830: Data Communications and Computer Networks
- ▷ CS 3870: Web Protocols, Technologies and Applications
- ▷ CS 7220: Software Project II

REFEREED **Following standard convention for publications in theoretical Computer Science,**
PUBLICATIONS **my co-authors and I are listed on all publications in alphabetical order, with**
no special positions for lead author, second author, etc.

2021 David Furcy, Scott M. Summers, and Christian Wendlandt *Self-assembly of and optimal encoding within thin rectangles at temperature-1 in 3D*, Theoretical Computer Science (to appear). Journal version of *New Bounds on the Tile Complexity of Thin Rectangles at Temperature-1*, by David Furcy, Scott M. Summers, and Christian Wendlandt, from DNA25.

2020 Jacob Hendricks, Matthew J. Patitz, and Scott M. Summers, *Hierarchical Growth is Necessary and (Sometimes) Sufficient to Self-Assemble Discrete Self-Similar Fractals*, Natural Computing 19(2): 357-374 (2020). Special issue of invited papers from the Twenty Fourth International Conference on DNA Computing and Molecular Programming (DNA24).

- 2019** David Furcy, Scott M. Summers, and Christian Wendlandt *New Bounds on the Tile Complexity of Thin Rectangles at Temperature-1*, Proceedings of the Twenty Fifth International Conference on DNA Computing and Molecular Programming (DNA25), pp. 100-119.
- 2018** Jacob Hendricks, Matthew J. Patitz, and Scott M. Summers, *Hierarchical Growth is Necessary and (Sometimes) Sufficient to Self-Assemble Discrete Self-Similar Fractals*, Proceedings of the Twenty Fourth International Conference on DNA Computing and Molecular Programming (DNA24), pp. 87-104.
- David Furcy and Scott M. Summers, *Optimal self-assembly of finite shapes at temperature 1 in 3D*, Algorithmica 80(6):1909–1963, 2018. Special issue of invited papers from the Ninth Annual International Conference on Combinatorial Optimization and Applications (COCOA 2015).
- Jacob Hendricks, Matthew J. Patitz, Trent A. Rogers and Scott M. Summers, *The Power of Duples (in Self-Assembly): It's Not So Hip To Be Square*, Theoretical Computer Science 743:148–166(2018). Special issue of invited papers from the Twentieth annual International Computing and Combinatorics Conference (COCOON 2014).
- Matthew J. Patitz, Trent A. Rogers, Robert Schweller, Scott M. Summers and Andrew Winslow, *Resiliency to Multiple Nucleation in Temperature-1 Self-Assembly*, Natural Computing 17(1):31–46, 2018. Special issue of invited papers from the Twenty Second International Conference on DNA Computing and Molecular Programming (DNA22).
- 2017** David Furcy, Samuel Micka and Scott M. Summers, *Optimal program-size complexity for self-assembled squares at temperature 1 in 3D*, Algorithmica 77(4):1240–1282, 2017.
- David Furcy and Scott M. Summers, *Scaled pier fractals do not strictly self-assemble*, Natural Computing 16(2):317–338, 2017.
- 2016** Matthew J. Patitz, Trent A. Rogers, Robert Schweller, Scott M. Summers and Andrew Winslow, *Resiliency to Multiple Nucleation in Temperature-1 Self-Assembly*, Proceedings of the Twenty Second International Conference on DNA Computing and Molecular Programming (DNA22), pp. 98–113.
- Erik D. Demaine, Matthew J. Patitz, Trent A. Rogers, Robert T. Schweller, Scott M. Summers and Damien Woods, *The two-handed tile assembly model is not intrinsically universal*, Algorithmica 74(2): 812-850, 2016.
- 2015** David Furcy and Scott M. Summers, *Optimal self-assembly of finite shapes at temperature 1 in 3D*, Proceedings of the Ninth Annual International Conference on Combinatorial Optimization and Applications (COCOA 2015), pp. 183–151.
- David Furcy, Samuel Micka and Scott M. Summers, *Optimal program-size complexity for self-assembly at temperature 1 in 3D*, Proceedings of the Twenty first International Conference on DNA Computing and Molecular Programming (DNA 21), pp. 71–86. Samuel Micka received **Best Student Paper** award for this paper.
- Scott M. Summers, *Temperature programming in self-assembly*, Encyclopedia of Algorithms 2016:2209–2212.

- 2014** Kimberly Barth, David Furcy, Scott M. Summers and Paul Totzke, *Scaled tree fractals do not strictly self-assemble*, Proceedings of the Thirteenth International Conference on Unconventional Computation and Natural Computation (UCNC 2014), pp. 27–39.
- Jacob Hendricks, Matthew J. Patitz, Trent A. Rogers and Scott M. Summers, *The Power of Duples (in Self-Assembly): It's Not So Hip To Be Square*, Proceedings of the Twentieth annual International Computing and Combinatorics Conference (COCOON 2014), pp. 215–226.
- Jennifer E. Padilla, Matthew J. Patitz, Raul Pena, Robert T. Schweller, Nadrian C. Seeman, Robert Sheline, Scott M. Summers and Kingsi Zhong, *Asynchronous Signal Passing for Tile Self-Assembly: Fuel Efficient Computation and Efficient Assembly of Shapes*, International Journal of Foundations of Computer Science, 25(4):459–488, 2014. Special issue of invited papers from the 2013 International Conference on Unconventional Computation and Natural Computation (UCNC 2013).
- Pierre-Étienne Meunier, Matthew J. Patitz, Scott M. Summers, Guillaume Theyssier, Andrew Winslow, Damien Woods, *Intrinsic universality in self-assembly requires cooperation*, Proceedings of the Twenty fifth annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2014), pp. 752–771.
- 2013** Erik D. Demaine, Matthew J. Patitz, Trent A. Rogers, Robert T. Schweller, Scott M. Summers and Damien Woods, *The two-handed tile assembly model is not intrinsically universal*, Proceedings of the Fortieth International Colloquium on Automata, Languages and Programming (ICALP 2013), pp. 400–412.
- Jennifer E. Padilla, Matthew J. Patitz, Raul Pena, Robert T. Schweller, Nadrian C. Seeman, Robert Sheline, Scott M. Summers and Kingsi Zhong, *Asynchronous Signal Passing for Tile Self-Assembly: Fuel Efficient Computation and Efficient Assembly of Shapes*, Proceedings of the 2013 International Conference on Unconventional Computation and Natural Computation (UCNC 2013), pp. 174–185.
- Sarah Cannon, Erik D. Demaine, Martin L. Demaine, Sarah Eisenstat, Matthew J. Patitz, Robert T. Schweller, Scott M. Summers and Andrew Winslow, *Two Hands Are Better Than One (up to constant factors): Self-Assembly In The 2HAM vs. aTAM*, Proceedings of the Thirtieth International Symposium on Theoretical Aspects of Computer Science (STACS 2013), pp. 172–184.
- 2012** Matthew J. Patitz and Scott M. Summers, *Identifying shapes using self-assembly*, Algorithmica 64(3):481–510, 2012. Special issue of invited papers from the Twenty First International Symposium on Algorithms and Computation (ISAAC 2010).
- David Doty, Jack H. Lutz, Matthew J. Patitz, Robert T. Schweller, Scott M. Summers and Damien Woods, *The tile assembly model is intrinsically universal*, Proceedings of the Fifty Third Annual IEEE Symposium on Foundations of Computer Science (FOCS 2012), pp. 302–310.
- Scott M. Summers, *Reducing tile complexity for the self-assembly of scaled shapes through temperature programming*, Algorithmica 63(1):117–136, 2012.
- 2011** David Doty and Matthew J. Patitz and Scott M. Summers, *Limitations of self-assembly at temperature 1*, Theoretical Computer Science 412(1-2):145–158, 2011. Special issue of invited papers from Complexity of Simple Programs workshop (CSP 2008).

- Matthew J. Patitz and Scott M. Summers, *Self-assembly of infinite structures: a survey*, Theoretical Computer Science 412(1-2):159–165, 2011. Special issue of invited papers from Complexity of Simple Programs workshop (CSP 2008).
- Matthew J. Patitz, Robert T. Schweller and Scott M. Summers, *Exact shapes and Turing universality at temperature 1 with a single negative glue*, Proceedings of the Seventeenth International Conference on DNA Computing and Molecular Programming (DNA 17), pp. 175–189.
- Erik D. Demaine, Matthew J. Patitz, Robert T. Schweller and Scott M. Summers, *Self-assembly of arbitrary shapes using RNase enzymes: meeting the Kolmogorov bound with small scale factor*, Proceedings of the Twenty Eighth International Symposium on Theoretical Aspects of Computer Science (STACS 2011), pp. 201–212.
- Matthew J. Patitz and Scott M. Summers, *Self-assembly of decidable sets*, Natural Computing, 10(2):853–877, 2011. Special issue of invited papers from the Seventh International Conference on Unconventional Computation (UC 2008).
- James I. Lathrop, Jack H. Lutz, Matthew J. Patitz and Scott M. Summers, *Computability and complexity in self-assembly*, Theory of Computing Systems, 48:617–647, 2011. Special issue of invited papers from the Fourth Conference on Computability in Europe (CiE 2008).
- 2010** Matthew J. Patitz and Scott M. Summers, *Identifying shapes using self-assembly*, Proceedings of the Twenty First International Symposium on Algorithms and Computation (ISAAC 2010), pp. 458–469.
- David Doty, Matthew J. Patitz, Dustin Reishus, Robert T. Schweller and Scott M. Summers, *Strong fault-tolerance for self-assembly with fuzzy temperature*, Proceedings of the Fifty First Annual IEEE Symposium on Foundations of Computer Science (FOCS 2010), pp. 417–426.
- David Doty, Jack H. Lutz, Matthew J. Patitz, Scott M. Summers and Damien Woods, *Intrinsic universality in self-assembly*, Proceedings of the Twenty Seventh International Symposium on Theoretical Aspects of Computer Science (STACS 2010), pp. 275–286.
- Matthew J. Patitz and Scott M. Summers, *Self-assembly of discrete self-similar fractals*, Natural Computing, 9(1):135–172, 2010. Special issue of invited papers from The Fourteenth International Meeting on DNA Computing (DNA 14).
- 2009** David Doty, Jack H. Lutz, Matthew J. Patitz, Scott M. Summers and Damien Woods, *Random number selection in self-assembly*, Proceedings of the Eighth International Conference on Unconventional Computation (UC 2009), pp. 143–157.
- David Doty, Matthew J. Patitz and Scott M. Summers, *Limitations of self-assembly at temperature 1*, Proceedings of The Fifteenth International Meeting on DNA Computing and Molecular Programming (DNA 15), pp. 35–44.
- James I. Lathrop, Jack H. Lutz and Scott M. Summers, *Strict self-assembly of discrete Sierpinski triangles*, Theoretical Computer Science, 410:384–405, 2009. Special issue of invited papers from the Third Conference of Computability in Europe (CiE 2007).
- 2008** Matthew J. Patitz and Scott M. Summers, *Self-assembly of decidable sets*, Proceedings of the Seventh International Conference on Unconventional Computation (UC 2008), pp. 206–219.

Matthew J. Patitz and Scott M. Summers, *Self-assembly of discrete self-similar fractals*, Proceedings of The Fourteenth International Meeting on DNA Computing (DNA 14), pp. 156–167.

James I. Lathrop, Jack H. Lutz, Matthew J. Patitz and Scott M. Summers, *Computability and complexity in self-assembly*, Proceedings of the Fourth Conference on Computability in Europe (CiE 2008), pp. 349–358.

2007 James I. Lathrop, Jack H. Lutz and Scott M. Summers, *Strict self-assembly of discrete Sierpinski triangles*, Proceedings of the Third Conference of Computability in Europe (CiE 2007), pp. 455–464.

INVITED
TALKS

New bounds on the tile complexity of thin rectangles at temperature-1, Google Madison, Madison, WI (2020).

The theory of tile self-assembly with multiple temperatures, Computer Science and Computer Engineering department research colloquium, University of Arkansas (2014).

Two Hands are Better Than One, Invited workshop speaker at the Thirteenth International Conference on Unconventional Computation and Natural Computation (UCNC 2014).

Limitations of self-assembly at temperature 1, International Workshop on The Complexity of Simple Programs (CSP 2008), University College Cork, Ireland December 6–7, 2008.

Strict self-assembly of discrete Sierpinski triangles, University of Wisconsin–Green Bay Department of Computer Science Colloquium, Green Bay, WI May 9, 2008.

SERVICE

Program committee:

- ▷ Sixteenth International Conference on Unconventional Computation and Natural Computation (UCNC 2017)
- ▷ Fifteenth International Conference on Unconventional Computation and Natural Computation (UCNC 2016)

Journal referee:

- ▷ Algorithmica
- ▷ Fundamenta Informaticae
- ▷ Natural Computing
- ▷ SIAM Journal on Computing
- ▷ Theoretical Computer Science

Conference referee:

- ▷ ACM-SIAM Symposium on Discrete Algorithms (SODA 2013)
- ▷ Innovations in Theoretical Computer Science (ITCS 2013)
- ▷ International Conference on DNA Computing and Molecular Programming (DNA 19)
- ▷ International Conference on Unconventional Computation and Natural Computing (UCNC 2014)
- ▷ Symposium on the Theoretical Aspects of Computer Science (STACS 2015)
- ▷ Symposium on the Theory of Computation (STOC 2015)
- ▷ International Conference on DNA Computing and Molecular Programming (DNA 21)
- ▷ International Colloquium on Automata, Languages, and Programming (ICALP 2018)
- ▷ ACM-SIAM Symposium on Discrete Algorithms (SODA 2019)
- ▷ International Conference on DNA Computing and Molecular Programming (DNA 25)

- ▷ International Conference on DNA Computing and Molecular Programming (DNA 26)
- ▷ International Colloquium on Automata, Languages, and Programming (ICALP 2021)