

Daniel Zwillinger – Professional Activities

- **Google Scholar** in July 2026 (https://scholar.google.com/citations?user=zHIe1_UAAAAJ)

	All	Since 2020
Citations	8,284	2,476
h-index	12	7
i10-index	13	7

- **Publications – Books**

1. **Understanding 6 Sigma Tools in 6 Minutes**, **Zwillinger**, self-published, free at <https://www.sixsigmainsixminutes.com/>, 2025. Also available on Amazon.
 - *After becoming a Six Sigma Black Belt, I thought it would be convenient to have a collection of Six Sigma tools, simply described, in one place.*
2. **Introducing Game Theory and its Applications**, E. Mendelson and **Zwillinger**, 2nd edition, Chapman and Hall/CRC, 2024.
 - *In recent years, I have become interested in game theory.*
3. **Handbook of Differential Equations**, **Zwillinger** and V. Dobrushkin, 4th edition, Chapman and Hall/CRC, 2021.
 - *Differential equations were my first love. It is convenient to have a collection of techniques, simply described, in one place. My first book, the first edition was published in 1988.*
4. **Standard Mathematical Tables and Formulae**, **Zwillinger**, Editor-in-chief of 30th (1996) through 33rd (2018) editions. 34th edition in preparation (2026). Chapman and Hall/CRC. Chinese and CD-ROM versions of 30th edition available.
 - *When I was in High School, the 28th edition of this was my favorite book.*
5. **Tables of Integrals, Series, and Products**, by Gradshteyn and Ryzhik, 8th edition, **Zwillinger** and V. Moll (eds.), 9th edition in preparation (2025).
 - *A very useful book. When I was a graduate student, I had two copies (5th edition), one for home use and one for office use.*
6. **Standard Probability and Statistics Tables and Formulae**, **Zwillinger** and S. Kokoska, Chapman and Hall/CRC, 2000.
 - *In graduate school, I began to fully appreciate probability and statistics.*
7. **Standard Probability and Statistics Tables and Formulae, Student Edition**, S. Kokoska and **Zwillinger**, Chapman and Hall/CRC, 2000.
 - *A student edition of the above book.*
8. **Handbook of Integration**, **Zwillinger**, Jones & Bartlett (now distributed by AK Peters/CRC), 1992.
 - *I have always considered integration an intellectual exercise. It is convenient to have a collection of techniques, simply described, in one place.*



- **Publications – Refereed**

1. **Zwillinger**, B. Foley, and K. Mittelstaedt, "Six Sigma Tools in Six Minutes," *Six Sigma Forum Magazine*, Volume 15, Number 2, Feb 2016.
2. **Zwillinger**, "As Easy as 1, 3, 9?" *Six Sigma Forum Magazine*, Volume 12, Number 4, Aug 2013, pages 23–26.
3. **Zwillinger**, "Coarsening of Non-Spherical Particles," *Journal of Crystal Growth*, **94**, No. 1, 1989, pages 159–165.
4. **Zwillinger**, "Differential PPM has a Higher Throughput than PPM for the Band-Limited and Power-Limited Optical Channel," *IEEE Transactions on Information Theory*, **34**, No. 5, September 1988, pages 1269–1273.
5. **Zwillinger**, "Morphological Stability of Two Particle Diffusion in Three Dimensions," *Journal of Crystal Growth*, **74**, No. 1, 1986, pages 48–56.
6. **Zwillinger**, "Random Sum of Sines," *Applied Acoustics*, **19**, 1986, pages 305–307.
7. **Zwillinger** and B. S. White, "Propagation of Initially Plane Waves in the Region of Random Caustics," *Wave Motion*, **7**, 1985, pages 207–227.
8. **Zwillinger**, "A Goldbach Conjecture Using Twin Primes," *Mathematics Of Computation*, **33**, No. 147, July 1979, page 1071.

- **Publications – Other**

1. **Zwillinger** and P. San Clemente, "Game theory analysis when playing the wrong game," 17 Jul 2023, <https://arxiv.org/abs/2307.10257>
2. A. Metzner and **Zwillinger**, "Kuhn Poker with Cheating and Its Detection," 9 Nov 2020, <https://arxiv.org/abs/2011.04450>
3. G. Palmer, A. Selwyn, and **Zwillinger**, "The "Trust V": Building and Measuring Trust in Autonomous Systems," In book: "Robust Intelligence and Trust in Autonomous Systems" (pages 55-77), Springer, April 2016.
4. **Zwillinger**, "Voting Power of Teams Working Together," 12 Dec 2013, <http://arxiv.org/abs/1312.3394>
5. E. Brookner, B. Porter, K. Chang, Y.-C. Chang, **Zwillinger**, B. Considine, and T. Sikina, "Demonstration of accurate prediction of PAVE PAWS embedded element gain," 2010 IEEE International Symposium on Phased Array Systems and Technology, pp 417-422, 12-15 Oct 2010
6. **Zwillinger**, "Judge's Commentary: The Outstanding Irrigation Papers," *The Journal of Undergraduate Mathematics and Its Applications*, Fall 2006, Vol. 27, No. 3, pages 329–332.
7. **Zwillinger**, "Judge's Commentary: The Outstanding Flood Planning Papers," *The Journal of Undergraduate Mathematics and Its Applications*, Fall 2005, Vol. 26, No. 3, pages 279–281.
8. **Zwillinger**, "Judge's Commentary: The Outstanding Grade Inflation Papers," *The Journal of Undergraduate Mathematics and Its Applications*, Fall 1998, Vol. 19, No. 3, pages 323–327.
9. **Zwillinger**, "Judge's Commentary: The Outstanding Helix Intersections Papers," *The Journal of Undergraduate Mathematics and Its Applications*, Fall 1995, Vol. 16, No. 3, pages 251–253.
10. M. T. Strauss and **Zwillinger**, "Luggage Simulation," *CADalyst*, October 1995, page 29.
11. **Zwillinger**, "Visualization of Circuit Card EM Fields," US Government report, AD-A347-002, March 1998.
12. **Zwillinger**, "Visualization of Circuit Card Electromagnetic Fields," US Government report, AD-A291 491, January 1995.
13. Strauss and **Zwillinger**, "A Luggage Simulation Tool," Final Report for Department of Transportation contract DTRS-57-93-C-00113, March 1994.
14. **Zwillinger** and M. Sousa, "Analytical Determination of the Matrix Pseudo-Inverse," *Macsyma Newsletter*, **VII**, No. 3, July 1990, pages 1-8.
15. S. Marsh, M. Glicksman and **Zwillinger**, "Statistical Mechanics of Mushy Zones," *Modeling and Control of Casting and Welding Processes IV*, A. F. Giamei and G. J. Abbaschian (eds.), The Metallurgical Society, Warrendale, P.A., 1988, pages 921-928.

16. **Zwillinger**, "Completing The L-th Power in $\mathbb{Z}[x]$," *SIGSAM Journal of The ACM*, **18**, No. 3, issue 71, pages 20–22, August 1984.

- **Presentations**

1. Daniel C. Fox, ..., **Zwillinger**, ..., "Resolution for Object Detection in Satellite Imagery: A Class-Specific Approach", NCTA 2025, 17th International Conference on Neural Computation Theory and Applications, Marbella - Spain, October 22–24, 2025, <https://ncta.scitevents.org>
2. **Zwillinger** and M. Gerken, "Mathematical modeling and analysis of aircraft flight data," MORS (Military Operations Research Society) Emerging Techniques Forum, Laurel MD, 7 December 2023.
3. **Zwillinger**, "Math Models & Tools (Not Mathematical Modeling)," Tufts University, Mathematics graduate student presentation, 15 March 2023.
4. **Zwillinger**, J. Sierchio, M. Gerken, and E. Clark, "Distributing data throughout a MANET in a communications denied environment: reinforcement learning and game theory approaches," 6 June 2022, in Proceedings Volume 12113, Artificial Intelligence and Machine Learning for Multi-Domain Operations Applications IV; 121130G (2022) <https://doi.org/10.1117/12.2618517>, Event: SPIE Defense + Commercial Sensing, 2022, Orlando, Florida.
5. **Zwillinger**, "Topics in differential equations: exact, approximate, and numerical," Tufts University, Mathematics graduate student presentation, 31 March 2021.
6. A. Metzner and **Zwillinger**, "Cheating and its detection in games such as poker and paintball," Joint Mathematics Meeting, Denver, CO, 16 January 2020.
7. L. Bookman, J. Ubnoske, and **Zwillinger**, "Classifying the difficulty of the k-clique problem," Joint Mathematics Meeting, Baltimore, MD, 15 January 2019.
8. A. Zagorianakos and **Zwillinger**, "Assessing Design Impact Using a Multi-Accurate Measurement Model," WCX 17: SAE World Congress Experience, Detroit, MI, March 2017.
9. **Zwillinger**, "Six Sigma Tools in Six Minutes," presentation to the Granite State section of the ASQ (American Society for Quality), NH, 17 May 2016.
10. **Zwillinger**, "Six Sigma Tools in Six Minutes," presentation to the Merrimack Valley section of the ASQ (American Society for Quality), MA, 7 April 2016.
11. S. P. Marsh, C. S. Pande (Naval Research Laboratory, Washington, DC); M. E. Glicksman (Rensselaer Polytechnic Institute, Troy, NY); **Zwillinger** (Aztec Corporation, Waltham, MA), "Environmental noise effects in statistical coarsening theory", in Computational and Mathematical Models of Microstructural Evolution", Materials Research Society meeting, 14–16 April 1998
12. **Zwillinger**, "Computer Verification of Integral Tables," 1993 SIAM National Meeting, Philadelphia. (12 July 1993)
13. S. P. Marsh, **Zwillinger**, and M. E. Glicksman, "A General Geometric Model of Coarsening: Mathematical Development--I," invited paper, 1988 SIAM National Meeting.
14. **Zwillinger**, M. E. Glicksman, and S. P. Marsh, "A General Geometric Model of Coarsening: Mathematical Development--II," invited paper, 1988 SIAM National Meeting.
15. **Zwillinger**, S. P. Marsh, and M. E. Glicksman, "Statistical Mechanics of Mesoscale Behavior," contributed paper, 1987 SIAM National Meeting.

- **Student Engagements**

1. Mentor for collegiate student projects (BAE Systems funded)
 - 2020 – D. Rice and **Zwillinger** – Rensselaer Polytechnic Institute (RPI) capstone project – [Can you recover a building's floorplan from exfiltratable cell phone data?](#)
 - 2021 – **Zwillinger** and C. Svoboda – Rensselaer Polytechnic Institute (RPI) capstone project – [Can drones quickly identify people from the exterior of a burning building?](#)

- 2023 – **Zwillinger** – Worcester Polytechnic Institute (WPI) MQP (Major Qualifying Project) – [Can 10 autonomous drones survey a building's interior 10 times faster than 1 drone?](#)
- 2024 – **Zwillinger** and A. Nolan – Worcester Polytechnic Institute (WPI) GQP (Graduate Qualifying Project) – [How many pixels are required for object identification?](#)
- 2. Visiting SIAM (Society of Industrial and Applied Mathematics) lecturer, 1992–1999. Lectured to undergraduates on applied mathematics topics at Worcester Polytechnic Institute (WPI), University of Rhode Island (URI), and other locations.
- **Patents (7 awarded + 1 pending)**
 1. **Chamber-Less Thin-Film Deposition in Vacuum Environments**
 - **Zwillinger**; 2027 (?)
 - (Patent pending)
 - *This patent shows how to exploit the vacuum in space to create solar cells on the moon or in orbit around a planet.*
 2. **Movement Initiated Automated Information Transfer**
 - **Zwillinger**; 2026
 - <https://patents.google.com/patent/US12732229B2>
 - *This patent shows how an acceleration vector can determine how to transfer information between devices without contact and without a user interface.*
 3. **Impact Initiated Automated Information Transfer (2 patents)**
 - **Zwillinger**; 2025
 - <https://patents.google.com/patent/US12284001B2>
 - <https://patents.google.com/patent/US12425073B2>
 - Patents pending in China, Europe, and India.
 - *These patents show how an acceleration vector can determine how to transfer information between devices with contact and without a user interface.*
 4. **Custodianship model for decentralized track fusion**
 - E. Duchon, I.-J. Nelson, S. Li, H. Vo, **Zwillinger**; 2021
 - <https://patents.google.com/patent/US11057740B2>
 - *This patent shows how to distribute information among a drone swarm.*
 5. **Cooperative system and method for precise autonomous delivery**
 - **Zwillinger**, R. Hettich, and J. Cogliandro; 2016
 - <https://patents.google.com/patent/US9412280B1>
 - Patented in US, Canada, European Union, and Japan; sold to Uber
 - *This patent informs a drone where to deliver a package.*
 6. **Tarp having a unique identifier and a plurality of grommets for drone navigation** (Design patent)
 - **Zwillinger**, R. Hettich, and J. Cogliandro; 2017
 - <https://patents.google.com/patent/USD797648S1>
 - *This design patent supports the above drone delivery patent.*
 7. **Tarp with sleeve for drone navigation** (Design patent)
 - **Zwillinger**, R. Hettich, and J. Cogliandro; 2017
 - <https://patents.google.com/patent/USD796418S1>
 - *This design patent supports the above drone delivery patent.*

