

Daniel Zwillinger, PhD

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OVERVIEW

Thirty years' experience in solving technical and business problems in engineering and the physical sciences. Experienced in large and small companies, government labs, consulting, and academia.

TECHNICAL STRENGTHS

- ✓ Experienced in identifying and resolving the key issue of a technical problem.
- ✓ Extensive experience in algorithm design, data analysis, modeling & simulation, software requirements.
- ✓ Computer expertise: Matlab, Mathematica, Perl, R, SQL.

BUSINESS STRENGTHS

- ✓ Six Sigma (6 σ) black belt; both Raytheon and ASQ certified.
- ✓ Project and personnel management experience with fiscal responsibility
- ✓ Founded and ran a small business for 10 years.

COMMUNICATION STRENGTHS

- ✓ Excellent technical communication skills. Wrote several technical books.
- ✓ College professor for four years at RPI (Rensselaer Polytechnic Institute)

EDUCATION

PhD	California Institute of Technology	Applied Mathematics	1983
BS	Massachusetts Institute of Technology	Mathematics	1978

INDUSTRIAL EXPERIENCE

[Autoliv – Validation Technologist \(2015–current\)](#)

Perform analytical and mathematical modeling in support of automobile radar validation. Act as chief statistician for Active Safety division. Created requirements and prototyped systems for: statistical analysis, LIDAR object classification, vehicle sensor calibration & synchronization. Analyzed driving data to reveal systemic issues.

[Raytheon – Senior Principal Systems Engineer & Six Sigma Black Belt \(2001–2015\)](#)

Systems Engineering • SW Requirements lead for C-Band Radar Project Line • Test lead for IRAD radar calibration project • Led systems engineering, usability, and deployment for new Time Cards: \$30M benefit from improved interfaces & functionality • SW requirements lead for Pre- and Post-Mission Software for Cobra Judy Replacement (CJR) • Test lead for Multiple Hypothesis Tracking (MHT) for Updated Early Warning Radar (UEWR)

Six Sigma • Twice won “President’s Best Six Sigma Project of the Year” award • Improved VV&A (Verification, Validation & Accreditation) process for Zumwalt destroyer (DDG-1000) • Improved Patriot Missiles Rolling Wave process • Subject Matter Expert (SME) in Design for Six Sigma (DFSS), Critical Chain Program Management (CCPM), and Voice of the Customer (VoC) • Managed Six Sigma white/yellow belt training

Other • Project lead for “Trust in Autonomous Systems” • Four time winner of “Raytheon Innovation Challenge” • Taught Six Sigma and Matlab courses • Numerous modeling, simulation, and statistical activities

Held consulting, staff, and scientist positions at

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| o Exxon Research and Engineering 1981–1983 | Summer positions |
| o The MITRE Corporation 1987–1990 | o Sandia Laboratories 1979 |
| o Bolt Beranek and Newman (BBN) 1992–94 | o Jet Propulsion Laboratory (JPL) 1980 & 1981 |
| o IronBridge Networks 1999–2001 | o Institute for Defense Analysis (IDA) 1987 |

Solved problems in a variety of fields using mathematical analysis, modeling, and algorithm development.

Hands-on computer implementation using a variety of tools.

- Modeled and simulated hardware designs for a terabit router.
- Designed and created software for thin film optical interference filters.
- Developed coding schemes for communicating over NASA’s deep space net.
- Developed software for wave propagation through layered media.

ENTREPRENEURIAL EXPERIENCE

1. Founded an applied engineering consulting firm, [Aztec Corporation](#) (1990-1999). Handled business development, project and personnel management, proposal writing, and client negotiations.
 - Created Matlab's statistics toolbox ([The MathWorks](#)).
 - Principal investigator on [Air Force](#) SBIR contracts to develop automated-test equipment (ATE) system. Phase I: Explored novel physical effects to allow visualization of circuit board electromagnetic fields. Phase II: Prototyped a visualization system using electro-optic sensors.
 - Managed [Department of Transportation](#) SBIR contract: developed CAD tools for luggage simulations.
 - Rewrote the mathematical reference manual for [Macsyma](#).
 - Created electronic question testbanks to accompany textbooks for [McGraw-Hill](#).
 - Converted technical books to web format (HTML, Javascript) for [Academic Press](#).
 - Performed probabilistic modeling of random emitters for [PinPoint Corporation](#).
2. Co-founder of [China Spirits Corporation](#) (2014); manufacturer of Chinese liquors.
3. Patent #9,412,280: *Cooperative System and Method for Precise Autonomous Delivery*. Three related design patents are pending.

ACADEMIC EXPERIENCE

Assistant Professor of Mathematics & Computer Science at [Rensselaer Polytechnic Institute](#) (1983–1987).

Taught graduate and undergraduate courses in information theory, probability, statistics, linear algebra, discrete mathematics, differential equations, complex variables, and advanced calculus. Published papers on wave theory, information theory, materials engineering, and algorithmic design.

- Judge for annual undergraduate [Mathematical Contest in Modeling](#) (administered to more than 800 schools internationally). Created several of the competition problems. (1992–2012)
- Appointed a visiting SIAM ([Society of Industrial and Applied Mathematics](#)) lecturer (1992–1999)
- Appointed to Technology/Engineering Advisory Council for the [Massachusetts Board of Ed](#) (2000–2003)

PUBLISHED BOOKS

- Editor-in-chief of 30th–32nd editions of [Standard Mathematical Tables and Formulae](#) (CRC, 1995-2012), an extremely successful reference book (first edition in 1928) with two million copies sold (all editions). Assembled team of 2 associate editors, 13 advisory board editors, and 25 contributors. CD-ROM version with embedded Maple engine 1997. Chinese version 1998. Next edition (33rd) to appear in 2017.
- Authored two reference books - each was "Book of the Month" for the Library of Science book club:
 - [Handbook of Differential Equations](#) (Academic Press, 1st–3rd editions, 1989–1998; CD-ROM 1997)
 - [Handbook of Integration](#) (Jones and Bartlett, 1992).
- Co-authored [Standard Probability and Statistics Tables](#) (CRC, 2000)
- Editor-in-chief of [Tables of Integrals, Series, and Products](#) (Academic Press, 6th–8th editions 2000–2014)

PUBLISHING – OTHER

- Advisory editor for [Handbook of Chemistry and Physics](#) (CRC, 85th–97th editions, 2004–2016).
- Editor-in-chief of CRC's "[Advances in Applied Mathematics](#)" book series (CRC, 2013-present) <https://www.crcpress.com/Advances-in-Applied-Mathematics/book-series/CRCADVAPPMTH>
- Recent publications
 - "[Voting Power of Teams Working Together](#)", Dec 2013, <http://arxiv.org/abs/1312.3394>
 - "[As Easy as 1, 3, 9?](#)", *Six Sigma Forum Magazine*, Aug 2013
 - "[Six Sigma Tools in Six Minutes](#)", *Six Sigma Forum Magazine*, Feb 2016
 - "[The 'Trust V': Building and Measuring Trust in Autonomous Systems](#)", Chapter 4 in *Robust Intelligence and Trust in Autonomous Systems*, April 2016

OTHER

- Held several security clearances, Secret and Top Secret (DOE, DoD, NSA).
- Home page at www.mathtable.com/zwillinger/
- Hobby: creating a Differential Equations search engine
- Private pilot. Enjoy travelling and have vacationed in 40+ countries.

