

# Daniel Zwillinger, PhD

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## HIGHLIGHTS

Business professional with superb people, process, communication, and technical skills. Twenty five years successful experience in solving problems in business and the engineering and physical sciences. Experienced in large and small companies, government labs, consulting, and academia. Founded and ran a small business.

- Six Sigma ( $6\sigma$ ) black belt (both Raytheon and ASQ certified)
- Proven technical expertise in the engineering and physical sciences.
- Project and personnel management experience with fiscal responsibility.
- Proposal development and client contact experience.
- Extensive experience in algorithm design/implementation, modeling, simulation, and numerics.
- Excellent technical communication skills (both written and verbal). Wrote several reference books.
- PhD in Applied Mathematics from Caltech. College professor for 4 years at RPI.
- Computer skills: UNIX, Matlab, Mathematica, perl.

## EDUCATION

PhD	<b>California Institute of Technology</b>	Applied Mathematics	1983
BS	<b>Massachusetts Institute of Technology</b>	Mathematics	1978

## INDUSTRIAL EXPERIENCE

**Raytheon Senior Principal Systems Engineer** (2001–current)

*Systems Engineering* • Cobra Judy Replacement (CJR) requirements lead (“book boss”) for Pre- and Post-Mission Software (PPS) • Updated Early Warning Radar (UEWR) cued search requirements

- UEWR lead for sell-off of tracking functionality • Systems Engineering lead on Time Card project

*Six Sigma* • Six Sigma lead on Time Card project: \$30M savings from improved interfaces/functionality

- Zumwalt destroyer: \$2M savings from improved Verification, Validation & Accreditation process
- Patriot Missiles: \$1M savings from improved Rolling Wave process • Managed Six Sigma white/yellow belt training • Started Six Sigma learn-at-lunch program • Led and coached numerous projects; e.g. business wide training improvement, facilities relocation identification, shelter humidity/temperature control
- Subject Matter Expert (SME) in Design for Six Sigma (DFSS) and Critical Chain Program Management (CCPM) • On Black Belt certification board

*Other* • Taught Six Sigma, Matlab, and Simulink courses • Numerous modeling and simulation activities

- Mentored many engineers

**Sandia Laboratories** 1979

**Jet Propulsion Laboratory (JPL)** 1980–1981

**Exxon Research and Engineering** 1981–1983

**Institute for Defense Analysis (IDA)** 1987

**The MITRE Corporation** 1987–1990

**Bolt Beranek and Newman Inc. (BBN)** 1992–1994

**Aztec Corporation** 1990–present (see next page)

**IronBridge Networks** 1999–2001

Held consulting, staff, scientist, and founding positions.

- Solved engineering problems using mathematical analysis, modeling, and algorithm development.
- Hands on computer implementation using a variety of tools (e.g., Matlab, Mathematica, perl).
- Modeled and simulated hardware designs for terabit router.
- Designed internet packet routing strategies.
- Designed and created software for thin film optical interference filter design.
- Developed new coding schemes for communicating over NASA’s deep space net.
- Designed software for wave propagation through layered media, led development team.
- Developed mathematical model and computer implementation for an effective field theory in elasticity.
- Performed cryptographic analysis; geothermal energy cost analysis; signal processing analysis (Markov chains, filter design, neural networks, residue number systems, chaos)

## ENTREPRENEURIAL EXPERIENCE

Founded applied engineering consulting firm, **Aztec Corporation**. Responsible for business development, project and personnel management, proposal writing, and client negotiations.

- Created electronic question testbanks to accompany textbooks for **McGraw-Hill**. (2003–2005)
- Managed 4GL GUI project database using Delphi and Crystal Reports for **Birkhäuser**. (2000)
- Converted technical books to web-based format (HTML, Javascript) for **Academic Press**. (1998, 2000)
- Performed probabilistic modeling of random emitters for **PinPoint Corporation**. (1997–2000)
- Principal investigator on **US 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. (1994–1997)
- Managed completion of SBIR contracts for **SensAble Technologies**. (1996)
- Performed client negotiations, proposal development, and software construction for the world's largest management consulting firm specializing in aviation, **SH&E**. (1995–1996)
- Managed **US Department of Transportation** SBIR contract that developed CAD tools to simulate images of packed luggage for X-ray detection systems. (1995)
- Rewrote the Macsyma mathematical reference manual for **Macsyma**. (1992)
- Constructed statistics toolbox in Matlab for **The MathWorks**. (1990)

## ACADEMIC EXPERIENCE

Assistant Professor of Mathematics and 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 4 of the 70 problems used in the history of the competition. (<http://www.comap.com/undergraduate/contests/mcm>) (1992–2012)
- Appointed a visiting SIAM (**Society of Industrial and Applied Mathematics**) lecturer. Lectured to undergraduates on applied mathematics. (1992–1999)
- Appointed to Technology/Engineering Advisory Council for the **Mass. Board of Ed.** (2000–2003)

## PUBLICATIONS

- Editor-in-chief of 30<sup>th</sup>, 31<sup>st</sup>, and 32<sup>nd</sup> editions of **Standard Mathematical Tables and Formulae** (CRC, 1995, 2003, 2011), an extremely successful reference book with nearly two million copies in print (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.
- Authored the reference books: **Handbook of Differential Equations** (Academic Press, 1<sup>st</sup>–3<sup>rd</sup> editions, 1989–1998; CD-ROM 1997) and **Handbook of Integration** (Jones and Bartlett, 1992). Each was book of the month for the Library of Science book club. Co-authored **Standard Probability and Statistics Tables** (CRC, 2000) and co-edited **Tables of Integrals, Series, and Products** (Academic Press, 6<sup>th</sup>–8<sup>th</sup> editions 2000–2012).
- Advisory editor for **Handbook of Chemistry and Physics** (CRC, 85<sup>th</sup>–92<sup>nd</sup> editions, 2004–2011).
- Publication list at <http://www.mathtable.com/zwillinger/publications.htm>

## OTHER

- Private pilot.
- Have had numerous government security clearances (DOE, NSA, DoD). Active Secret clearance.
- Home page at <http://www.mathtable.com/zwillinger/>

