Daniel Zwillinger, PhD

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HIGHLIGHTS

Business professional with 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. Management experience; founded and ran a small business.

- Six Sigma (6σ) black belt
- 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	**California Institute of Technology**	Applied Mathematics	1983
BS	**Massachusetts Institute of Technology**	Mathematics	1978

INDUSTRIAL EXPERIENCE

Raytheon (Lexington, MA) ***Senior Principal Systems Engineer & Six Sigma Expert*** (2001–present)
• Critical Chain Program Management (CCPM) subject matter expert • Design for Six Sigma (DFSS) – Test Optimization lead & marketing lead • Zumwalt (DDG 1000) $2M cost reduction in Verification, Validation & Accreditation (VV&A) • Cobra Judy Replacement (CJR) requirements lead ("book boss") for Pre- and Post-Mission Software (PPS) • Updated Early Warning Radar (UEWR) requirements for cued search and testing lead for MHT tracking • $1M financial benefit from projects on: multiple hypothesis tracking, radar calibration, data logging, and requirements writing. • Taught Six Sigma, Matlab, and Simulink courses • Numerous modeling and simulation activities • Coached many Six Sigma projects • Mentored many engineers

IronBridge Networks (Lexington, MA) ***Principal Engineer*** (1999–2001)
• Modeled and simulated hardware designs for terabit router • Designed internet packet routing strategies

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)

Held consulting, technical staff, senior scientist, and founding positions.

- Created engineering solutions using mathematical analysis, algorithm development, computer implementation.
- Performed mathematical modeling using a variety of tools (e.g., Matlab, Mathematical, perl)
- Designed and created software for thin film optical interference filter design.
- Designed software for wave propagation through layered media, led development team.
- Developed new coding schemes for communicating over NASA's deep space net.
- Performed cryptographic analysis.
- Performed geothermal energy cost analysis.
- Provided mathematical and computer support for an effective field theory in elasticity.
- Taught a thirty contact-hour industrial course on probability and statistics.
- Worked in various aspects of signal processing, including: modeling and simulation, radar systems, Markov chains, filter design, neural networks, residue number systems, chaos.
- Proposed research projects & briefed customers and many management levels.

ENTREPRENEURIAL EXPERIENCE

Founded applied engineering consulting firm, **Aztec Corporation**, in 1990 (incorporated in 1995). Responsible for business development, project and personnel management, proposal writing, and client negotiations. Won local IEEE Entrepreneur's Group business plan competition. Partial list of activities and clients:

- 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. Part of $10 million proposal for "NSF Center for Excellence" in multiphase research.

- 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/mcm.cfm`) (1992–2008)
- Appointed a visiting SIAM (**Society of Industrial and Applied Mathematics**) lecturer. Lectured to undergraduates on applied mathematics. (`http://www.siam.org/vlp/alpha.htm`) (1992–1999)
- Appointed to Technology/Engineering Advisory Council for the **Mass. Board of Ed.** (2000–2003)

PUBLICATIONS

- Editor-in-chief of the 30^{th} and 31^{st} editions of ***Standard Mathematical Tables and Formulae*** (CRC, 1995, 2003), 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^{st}–3^{rd} editions, 1989, 1992, 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^{th}–7^{th} editions 2000, 2007).
- On editorial advisory board for ***Handbook of Chemistry and Physics*** (CRC, 85^{th}–89^{th} editions, 2004–2008).
- 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/`
- Resume at `http://www.mathtable.com/zwillinger/resume.pdf`