Daniel Zwillinger, PhD

Newton, MA 02465 | DanZwillinger@gmail.com | 617-388-2382 | www.mathtable.com/zwillinger/

CHIEF SCIENTIST

Dedicated Chief Scientist with career expertise in solving technical and business problems for large and small companies, government labs, consulting, and academia. Experienced in identifying and resolving the key issues of technical problems. Extensive understanding of algorithm design, data analysis, modeling & simulation, and software requirements. Collaborative leader skilled in leveraging computer software tools such as MATLAB, Mathematica, and Python. Active DoD Top Secret clearance. Previously held an NSA clearance. Six Sigma (6σ) black belt; both Raytheon and ASQ certified. Looking for a technical leadership role with an individual contributor component.

AREAS OF EXPERTISE

Technical Project Management | Leadership | Lean Six Sigma | Data Analysis
Modeling & Simulation | Algorithm Design| Research | Applied Mathematician

PROFESSIONAL EXPERIENCE

BAE Systems, Burlington, MA
Chief Scientist **2018 – 2025**

Led creation of research proposals for AFRL, DARPA, DoD, DoS, DTRA, and IARPA. Led IRAD projects on Game Theory and multi-object tracking. Led multiple research teams using Game Theory and Koopman Analysis. Led team creating a patented decentralized data fuser. Mentored junior scientists. Principal Investigator (PI) on several research programs.

- Determined if geographically distributed drones are headed to a common location (DARPA).
- Optimized attacking and defending strategies of supply chains using game theory (AFRL).
- Designed and evaluated COA (Course of Action) metrics aligned with Surprise, Blinding, and Offensive (AFRL).
- Used Koopman models to create fast simulators for deep learning by autonomous vehicles (DARPA).

Autoliv, Lowell, MA **2015 – 2018**
Validation Manager

My team designed and created data collection systems, performed environmental testing, and determined radar performance using a fleet of 19 vehicles and 6 full-time drivers. Improved effectiveness, efficiency, capability, and capacity by process improvements.

- Created models for LIDAR object classification, radar calibration & synchronization. Experienced with ISO 17387.

Raytheon, Sudbury, MA **2001 – 2015**
Senior Principal Systems Engineer & Six Sigma Black Belt
Systems Engineering activities

- SW requirements lead for C-Band Radar Project Line.
- SW requirements lead for Pre- and Post-Mission Software for Cobra Judy Replacement (CJR).
- SW test lead for Multiple Hypothesis Tracking on UEWR. “Sold off” shalls to the government.
- HW test lead for X-band radar calibration exercise at Yuma, AZ.
- Led systems engineering, usability, and deployment for improved Time Card system.

Six Sigma activities

- Achieved $42M benefit (audited) from my three largest improvement projects.
- Twice won “President’s Best Six Sigma Project of the Year.” A four-time winner of “Raytheon Innovation Challenge.”
- Reduced cost of VV&A (Verification, Validation & Accreditation) process for Zumwalt destroyer (DDG-1000).
- Reduced cost of Patriot Missiles Rolling Wave process (converting planning packages to work packages).
- A Subject Matter Expert (SME) in Design for Six Sigma, Critical Chain Program Management, Voice of the Customer.
- Led the “Trust in Autonomous Systems” effort. Two conference presentations and a book chapter in 1 year.
- Managed (and frequent teacher of) the Six Sigma white/yellow belt training class (for 5 years).

ADDITIONAL RELEVANT EXPERIENCE

Bolt Beranek & Newman (BBN)
Exxon Research and Engineering
The MITRE Corporation
Institute for Defense Analysis (IDA)
IronBridge Networks
Jet Propulsion Laboratory (JPL)
Sandia Laboratories

ENTREPRENEURIAL EXPERIENCE

- Founded a consulting firm, Aztec Corporation. Handled business development, project and personnel management, proposal writing, and client negotiations.
    - Created first release of MATLAB's statistics toolbox for The MathWorks.
    - Principal investigator on Air Force SBIR contracts to develop automated-test equipment (ATE).
    - Managed Department of Transportation SBIR contract: developed CAD tools for luggage simulations.
    - Rewrote the mathematical reference manual for the computer language Macsyma.
- Co-founder of China Spirits Corporation (2014–2017); manufacturer of Chinese liquor.
- Created and sold US patent #9,412,280 to Uber (patented in 4 countries); how to deliver goods by drone.

ACADEMIC EXPERIENCE

Rensselaer Polytechnic Institute, Troy, NY
Assistant Professor of Mathematics & Computer Science

- 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.

PUBLISHED BOOKS

- Editor-in-chief of *Standard Mathematical Tables and Formulae* (CRC, 30th–33rd editions, 1995-2018), a very successful reference book (first edition in 1928) with two million copies sold.
- Created mathematical reference books - each was "Book of the Month" for the Library of Science book club:
    - *Handbook of Differential Equations* (Academic Press, 1st–4th editions, 1989–2021)
    - *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* (AP, 6th–8th editions 2000–2014, 9th edition in prep)
- Co-authored Introducing *Game Theory and Its Applications*, 2nd edition (CRC, 2024)

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 -- 48 books in series
- Recent publications
    - *Six Sigma Tools in Six Minutes*, https://www.sixsigmainsixminutes.com/book.pdf
    - *Voting Power of Teams Working Together*, http://arxiv.org/abs/1312.3394
    - *Kuhn Poker with Cheating and Its Detection*, https://arxiv.org/abs/2011.04450
    - *The 'Trust V': Building and Measuring Trust in Autonomous Systems*,
      Chapter 4 in Robust Intelligence and Trust in Autonomous Systems, 2016

EDUCATION

PhD - Applied Mathematics | California Institute of Technology
BS – Mathematics | Massachusetts Institute of Technology