

Curriculum Vitae
David G. Robinson

Principal Member of the Technical Staff
Sandia National Laboratories
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Education:

Ph.D. - University of Arizona, Tucson, AZ, in December 1986 majoring in Systems Engineering with a minor in Mechanical Engineering (emphasis on modeling reliability during design)

M.S.S.E - Air Force Institute of Technology, WPAFB, OH, in December 1981 majoring in Systems Engineering with a concentration in reliability and stochastic processes

B.S.M.E. - Colorado State University, Fort Collins, CO, in May 1977 with a concentration in material sciences

Professional History:

Oct 1997 – present Principal Member of the Technical Staff, Systems Reliability Department, Sandia National Laboratories, Albuquerque, NM 87185

Mar 1995 – Oct 1997 Senior Member of the Technical Staff, Systems Reliability Department, Sandia National Laboratories, Albuquerque, NM 87185

Feb 1994- Mar 1995 Senior Reliability Engineer, GRAM, Inc, Albuquerque, NM, 87112
Oct 1990 -Dec 1993 Associate Professor (with tenure), Department of Aeronautics and Astronautics, Air Force Institute of Technology, WPAFB, OH 45433

Oct 1990-Dec 1993 - Adjunct Professor Ohio Aerospace Institute, Cleveland, OH

Jan 1987-Oct 1990: Assistant Professor, Department of Aeronautics and Astronautics, Air Force Institute of Technology WPAFB, OH 45433

Jan 1984-Dec 1986: Graduate student, Department of Systems and Industrial Engineering, University of Arizona, Tucson, AZ 85721

Jan 1981- Dec 1983: Systems Engineer, AF Operational Test and Evaluation Center, Kirtland AFB, NM 87112

Jun 1980 - Dec 1981: Graduate student, Air Force Institute of Technology, WPAFB, OH 45433

Sep 1977 - May 1980 Reliability Engineer, Ogden Air Logistics Center, Ogden UT 84015

Current research topics:

- Development of new methods for the analysis and control of uncertainty throughout the system life-cycle. Currently developing new methods for reliability characterization of aging mechanical and electrical components (e.g. stress voiding of IC interconnects, thermo-mechanical fatigue of solder joints, corrosion, polymer degradation).
- Statistical characterization of bulk power stability/security. Recent investigations have centered on stochastic modeling of the precursors to network instability, specifically voltage collapse.

- Optimization of complex systems in the presence of uncertainty
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Professional Societies:

- Member of IEEE, ASME, AIAA
- Cochair of SAE G-11 Probabilistic Methods, Airworthiness Committee
- Chair of SAE G-11 Probabilistic Methods, Diagnostics Committee
- Chairman of Air Force Summer Reliability Design Workshop (4 week workshop)

Publications (Refereed):

- Robinson, David G. and Duckstein, L., *Polyhedral Dynamics as a Tool for Machine -Part Group Formation*, Inter Jour of Prod Res, Vol 24, No. 5, pp 1255-1266, 1986
- Robinson, David G. and Dietrich, D., *A Nonparametric-Bayes Reliability Growth Model*, IEEE Tran. Rel. R-3 1987.
- Robinson, David G. and Dietrich, D., *A New Nonparametric Growth Model*, IEEE Tran. Rel. R-36, No. 4, Oct 1987.
- Robinson, David G. and Neuts, M., *Increased Reliability Through Standby Redundancy*, IEEE Tran. Rel. R-38, No. 4, Oct 1989.
- Olinger, Jeff, and Robinson, D., *System Theoretic View of Fault Isolation*, Operational Test and Evaluation Technical Journal, Vol 3, No 1, Jan 1990.
- Robinson, David G., *Minimizing Risk During Test and Evaluation*, Reliability Technology, ASME AD-Vol 28, pp. 223-238, 1992.
- Parrot, R. W., Stytz, M., Amburn, P., Robinson, D. , *Towards Statistically Optimal Interpolation for 3D Medical Imaging*, IEEE Engineering in Medicine and Biology, September 1993.
- Robinson, David G., *Extension of Bond Graphs to Probability Distribution Functions*, vol 331B, no 1, pp 101-108, 1994.
- Stytz, M., Parrot, R. W., Amburn, P., Robinson, D. , *3D Medical Image Surface Rendering Using an Optimal Interpolating Function*, accepted for publication
- Robinson, David G., Toussaint, G., *Reliability of Unidirectional Fibrous Composites Using Genetic Algorithms*, Probabilistic Structural Mechanics: Advances in Structural Reliability Methods, Eds. P. Spanos, Y-T. Wu, Springer-Verlag, pp 455-465, 1994.
- Robinson, David G., *Applications of Neural Networks in Environment, Energy, and Health*, Chapter 8, Eds, P. Keller, S. Hashem, L. Kangas, R. Kouzes, World Scientific, New Jersey, 1995.
- Corner, Brian D., Robinson, D. G. *A New Method For Quantifying and Clustering Human Form Based On Spatial Statistics and Fuzzy Logic*, American Journal of Physical Anthropology, supplement 22, pp, 89-90, April 1996.
- Robinson, David G., *A New Spatial Modeling and Classification Algorithm for Human Faces*, Mathematical Modeling and Scientific Computing, Vol. 6, 1996.
- Robinson, D., *Reliability Analysis Using Neural Networks*, IEEE Trans on Reliability (in review).
- Robinson, D., *A Survey of Probabilistic Methods Used in Reliability, Risk and Uncertainty Analysis: Analytical Techniques I*, SAND98-1189, Sandia National Laboratories, 1998.

Robinson, D., S. Mahadevan, Z. Guo, *Time Dependent Stress Voiding of Electronic Circuits*, Third International Conference on Computational Stochastic Mechanics, Santorini, Greece, June, 1998.

S. Mahadevan, D. Robinson, Z. Guo, *Stress Voiding of Electronic Circuits*, in review IEEE Transactions on Reliability.

Publications (Proceedings):

Robinson, David G., and Young, D., *Planning for Reliability Growth*, Proceedings AIAA 2nd Flight Testing Conference 1983

Robinson, David G., and Dietrich, D., *A System Level Reliability Growth Model*, Annual IEEE Rel. Maint. Symp., Jan 1988.

Robinson, David G. and Hinnerichs, T., *R & M 2000 Activities at the Air Force Institute of Technology*, Proceedings Ann ASEE Conference, June 1988.

Landers, Tom L., and Robinson, D., *Integrating Reliability in Design and Manufacturing*, Proceedings Inter Ind Eng Conference, May 1988.

Briggs, H. C., Dewispelare, A. and Robinson, D., *System Engineering in the Aerospace Industry*, SAE Aerotech'88, October 1988

Pohl, E., Robinson, D. and Jacobs, J., *System Design with Quality Engineering*, Proceedings Nat. Aerospace Electronics Conference, May 1989.

Williams, B., and Robinson, D., *Partnership in Reliability Education*, Proceedings 5th International Congress of the Society of Logistics Engineers, London, May 1989.

Robinson, D., Grant, M., *Statistical Analysis of Anthropometric Data*, Proceedings 23rd Symposium on Interface of Computing Science and Statistics, 1991.

Tester, J., Robinson, D. *Multidisciplinary Modeling and Design of a Space System*, IEEE International Conf on Systems Engineering, Dayton, OH, Sept 1991.

Robinson, D., Brodtkin, C., *Application of Kriging for the Controlled Minimization of Large Data Sets*, Proceedings 24th Symposium on Interface of Computing Science and Statistics, College Station, Texas, April, 1992.

Parrot, R. W. , Stytz, M., Amburn, P., Robinson, D., *Statistically Optimal Interslice Value Interpolation in 3D Medical Imaging: Theory and Implementation*, Proceedings of the Fifth IEEE Symposium on Computer-Based Medical Systems, Duke, North Carolina, June, 1992.

Stytz, M., Parrot, R. W., Amburn, P., Robinson, D. , *3D Medical Image Surface Rendering Using an Optimal Interpolating Function*, Proceedings of the 14th International Conference of the IEEE Engineering in Medicine and Biology Society, Paris, France, October, 1992.

Robinson, D., *Reliability of Unidirectional Fibrous Composites Using Genetic Algorithms*, Proceedings of the IUTAM Symposium on Probabilistic Structural Mechanics, San Antonio, TX, June, 1993.

Byard, K., Robinson, D. *Advanced Manufacturing and Design Methods: A New Air-to-Air Missile*, AeroMat'93, Anaheim, CA, June, 1993.

Robinson, D., *Reliability and Risk Analysis Using Artificial Neural Networks*, Workshop on Environmental and Energy Applications of Neural Networks, Richland, WA, 30 March 1995.

Hosking, F., Robinson, D. *Development of Lead-Free Solders for Hybrid Microcircuits*, NEPCON SE, Orlando, FL, 1-2 Nov, 1995.

- Atcitty, C., Robinson, D., *Safety Assessment of a Robotic System Handling Nuclear Material*, 2nd Conference on Robotics for Challenging Environments, Albuquerque, NM, June, 1996.
- Robinson, D. Atcitty, C., *Safety Assessment of a High Consequence Robotic System*, 14th International System Safety Conference, Albuquerque, NM, Aug 1996.
- Robinson, D., A. Patton, C. Singh, *Electric Power Grid Reliability: A New Perspective*, Conf on Risk Management for Critical Infrastructures, Sandia National Laboratories, Albuquerque, NM, August 1997.
- Robinson, D., Atcitty, C., *Comparison of Quasi- and Pseudo-Monte Carlo Sampling for Reliability and Uncertainty Analysis*, AIAA-99-1589, AIAA/Structures, Structural Dynamics and Materials (SDM) Conference, St. Louis, MO, 12-15 April, 1999.
- Robinson, D., *CRAX/Cassandra Reliability Analysis Software*, AIAA-99-1594, AIAA/Structures, Structural Dynamics and Materials (SDM) Conference, St. Louis, MO, 12-15 April, 1999.
- Patton, A., C. Singh, D. Robinson, *N-area Reliability Analysis Techniques*, 13th International Power Systems Computation Conference, Trondheim, Norway, June 1999 (accepted for publication)

Publications (Recent SAND Reports):

- Robinson, D., *A Survey of Probabilistic Methods Used in Reliability, Risk and Uncertainty Analysis: Analytical Techniques I*, SAND98-1189, Sandia National Laboratories, Albuquerque, NM 87815, June 1998.
- Patton, A., C. Singh, D. Robinson, *The Impact of Restructuring Policy Changes on Power Grid Reliability*, SAND98-2178, Sandia National Laboratories, Albuquerque, NM 87815, October 1998.
- Hernandez, C. F. Hosking, D. Robinson, B. Rutherford, C. Green, F. Uribe, *Technique for Measuring Hybrid Electronic Component Reliability*, SAND98-2421, Sandia National Laboratories, Albuquerque, NM 87815, January 1999.
- Robinson, D. *Reliability Degradation Due to Stockpile Aging*, SAND99-0975, Sandia National Laboratories, Albuquerque, NM 87185, April 1999.

Publications (Abstracts):

- Robinson, D. and Duckstein, L., *Machine-Component Group Formation by Polyhedral Dynamics*, ORSA/TIMS Joint Nat. Mtg. April 1986.
- Robinson, D. and Olinger, J. *Isolation, Detection and Propagation of Faults Using Polyhedral Dynamics*, ORSA/TIMS Joint Nat. Mtg. October 1988.
- Robinson, D., *Modeling Scheduled and Unscheduled Maintenance as a Linear System*, ORSA/TIMS Joint Nat. Mtg, October 1989.
- Valentine, L., Robinson, D., *Controlling Risk during System Development*, ORSA/TIMS Joint Nat. Mtg, May 1989.
- Robinson, D., *Comparison of Classical and Stochastic Methods in Aircraft Design*, AIAA Symposium, Dayton, OH, March 1990
- Robinson, D., *Genetic Algorithms in Composite Design*, AIAA Symposium, Dayton, OH, March 1993