Yashwant K. Malaiya

1 Education

Ph.D.	(Electrical Engineering)	Utah State University	1978
M.S.	(Electronics)	BITS, Pilani, India	1974
M.S.	(Physics)	Saugor University, India	1971
B.S.	(Physics, Math)	GD College, Damoh, MP, India	1969

2 Experience

1990-: Professor, Computer Science Dept. Colorado State University, Ft. Collins, Colorado
1982-90: Associate Professor, Computer Science Dept., Colorado State University, Ft. Collins, Colorado
1978-82: Assistant Professor, Dept. of Computer Science, State Univ. of New York at Binghamton

3 Chronology

1978: Erdös Number 2
1989: First Senior Member of IEEE in CS department
1995: Antirandom testing proposed
1998: First patent in the CS department
2000: IEEE Third Millennium Medal
2005: Alhazmi-Malaiya Vulnerability Discovery Model proposed
2014: Software vulnerability markets: Discoverers and buyers

4 Areas of research emphasis

Quantiative Security, Reliability, Fault modeling and testing, Augmented Reality, Testable and Fault-tolerant digital design

5 Professional Activities

5.1 Conferences

- Finance chair, IEEE International Symposium on Software Reliability Engineering (ISSRE), Pasadena, 2013.
- General Chair , IEEE International Symposium on Software Reliability Engineering (ISSRE), Denver, 2003.
- General Chair, IEEE International Workshop on IDDQ Testing (IDDQ-95), Washington D.C., October 1995, 2000.
- General Co-Chair, IEEE Asian Test Symposium, Shanghai, 1999.
- General Chair, The Fourth International Symposium on Software Reliability Engineering (ISSRE), Denver, Nov. 1993.
- Program Co-Chair, The Eighth International Symposium on Software Reliability Engineering (ISSRE), Albuquerque, Nov. 1997.
- Chair Steering Committee, IEEE International Workshop on IDDQ Testing, 1996, 1997.
- IEEE laision for International Conference on VLSI Design 1994-1998.
- General Chair, Sixth International Conference on VLSI Design (VLSI Design ’93), Bombay, India, 1993.
- Program Chair, Fifth International Conference on VLSI Design (VLSI Design ’92) , Bangalore, India, 1992.

- General Chair, 24th ACM/IEEE International Symposium on Microarchitecture (Micro-24), Albuquerque, 1991.

5.2 Editing

- Guest editor, IEEE Software, Special issue on Reliability Measurement, July 1992, with P. Srimani.
- Guest Editor, IEEE Design & Test , Special issue on VLSI Design , Dec. 1992.
- Editor, MicroArch, Quarterly publication of IEEE CS TC on Microprogramming and Microarchitecture (1989-93)
- Digest of Papers - IEEE International Workshop on IDDQ Testing , Washington D.C., Oct. 1995.
- Editor-in-Chief, Journal of Software Engineering and Applications, 2011-cont.
- Editorial Review Board, Journal of Surveillance, Security and Safety, College Park, MD. (September 10, 2019 -)
- Member Editorial Board, ISRN Software Engineering 2011-., Intelligent Information management, 2011.
- Editor, Journal of Electronic Testing (JETTA) 2023-.

5.3 Accreditation of Computer Science programs

– Commissioner, ABET Computing Accreditation Commission, 2005
– Evaluator, Computing Sciences Accreditation Board, 1999-continuing. I have evaluated programs in USA (both research and teaching institutions) as well as overseas.

- ABET CSAB accreditation involves rigorous evaluation of a Comuter Science program at an institution. Criteria includes Student selection and progress, Program Educational Objectives, Continuous Improvement, Student Outcomes, Continuous Improvement, Curriculum, Faculty, Facilities, Institutional Support. The criteria includes both general and program specific. Most team members are department chairs. Evaluation involves examining the data comiled by the institution prior to visit and the on-site meetings and interviews.

5.4 Professional Organizations

– PC member: ICQRMS 2011, ISSRE 1995-2014, ISSRE Program Board 2018.
– Vice chair, IEEE CS Award Committee (1995-99) (Service Awards).
– Vice Chair, TCSE Software Reliability Engineering Committee (1990-96).
– Chair, Test Technology TC Subcommittee on Software Testing, (1993-2002).
– Member, Executive Committee, IEEE CS Technical Activities Board (1988-98); IEEE CS Conference and Tutorials Board (1994, 2000, 2001);
– Chair, IEEE-CS Technical Committee on Microprogramming and Microarchitecture, (1988-92).
– Senior Member IEEE Computer Society.
– Founder, India Association of Northern Colorado, President: 1998-2000, 2012-13.

6 Reviewer

- **Journals** : IEEE Computer, IEEE Transactions on Dependable and Secure Computing, IEEE Trans. Computers, IEEE Trans. Reliability, IEEE Trans. Software Engineering, IEEE Software, IEEE Trans. CAD, IEEE Journal of Solid State Circuits, IEEE Trans. VLSI Systems, IEEE Design and Test, IEEE Trans on Systems, Man, and Cybernetics, Software Process: Improvement and Practice, Software Quality Journal, Empirical Software Engineering, Software Testing, Verification and Reliability, Journal of Digital Systems, Journal of Electronic Testing, Naval Research Logistics Quarterly, IEE Electronic Letters, IET

Software, Int. Journal of Software Engineering, ISRN Software Engineering, Intelligent Information Management, Journal of Risk and Reliability, Computer Networks, Information Processing Letters, Information and Software Technology, Computer Standards & Interfaces, Information & Management, IEEE Access, Dependable Computing – Theory And Practice, Information and Software, Journal of Software: Evolution and Process, Sensors, Journal of Surveillance, Security and Safety, Operational Research Society of India, ACM Transactions on Software Engineering and Methodology, Computers and Security, Optimization & Information Computing.

- **Conferences**: Int. Symp. on Software Reliability Engineering, International Symposium on Fault-tolerant Computing, International Test Conference, Design Automation Conference, IEEE Tencon, Int. Symp. and Work. on Microprogramming and Microarchitecture, Asian Test Symposium, VLSI Design, IEEE/IFIP Int Conference on Embedded & Ubiquitous Computing Reliability Engineering & System Safety, IEEE Int. Conf. on Computer Science and Information Technology etc.
- Funding Agencies : National Research Council, NSF, Research Grants Council, Hong Kong, Uberoi foundation.
- **Publishers**: Computer Science Press, West Educational Publishing, John Wiley, McGraw-Hill, Asken, Columbia University Press, Cambridge University Press.
- **External Reviewer for Universities**: Roorkee University, State University of New York, Georgia Tech, University of Wyoming, Florida Atlantic University, Chinese University of Hong Kong, West Virginia State, University of Jordan, Thapar University, Taibah University,
- **Expert Testimony**: Alien of Extraordinary Ability for academic and industrial researchers.

7 Courses

Graduate: Quantitative Security (CS559, New course developed in 2020), Fault-Tolerant Computing (CS530), Past classes: Advanced Fault-Tolerant Computing (CS635).

Undergraduate: Operating systems (CS370), Computer Organization (CS270), Computer Architecture (CS470), Past classes: Interactive Programming with Java (CS160), Microprogramming and bit-sliced devices (CS455), Logic Design Microcomputer programming and interfacing, Discrete structures (CS166), Data Communications (CS457)

Enrollment in recent classes: CS530 Spring 2023: 15 in S001, 35 in S801 (total 50, highest for all 500 level Spring classes), CS559 Fall 2022: 13 in S001, 18 in S801 (second highest in Fall 500 level classes, after machine Learning). CS370 Fall 2022: 76 in S001, 21 in S801.

8 Recognitions

- Most influential papers -The 30 years of ISSRE, IEEE Int Symp on Software Reliability Eng, 2019
- Invited tutorial, Embedded Software Testing, IEEE VLSI Test Symposium, Las Vegas, 2017.
- Visitng Professor, Graduate School of Engineering, Hiroshima University, Summer 2016.
- Invited lecture, Reliability Allocation for Software projects using Static/Dynamic Software Reliability Modeling, OSRJ, TMU, Tokyo, August 2016.
- Keynote, 2014 International Conf. on Knowledge and Software Eng., "Security Vulnerabilities: Risks from Discovery to Exploitation"
- IEEE CS Certificate of Appreciation, 2003, "for exceptional effort as General Chair in organizing and running a successful ISSRE 2003".
- IEEE CS Meritorious Service Award, 2002 "For providing skilled management and guidance to the IEEE International Workshop on Defect Based Testing for over five years".
- IEEE Third Millennium Medal, 2000.
- Best Paper Award, ISSRE 1997 (see Publications).
- IEEE CS Golden Core Award, June 1996.

- IEEE CS Certificate of Appreciation Award, Oct. 20, 1996 "For significant leadership contribution to the International IDDQ Test Workshop as Chairman, 1995"
- IEEE CS Meritorious Service Award, Feb. 1993. For Tecgnical and administrative leadership while serving as Chair of the Technical Committee on Microprogramming and Microarchitecture
- Honorary appointment as Professor, Electrical Eng. Dept., CSU.
- Invited lectures at China Academy of Sciences, Beijing, and Shanghai University of Science and Technology (3 weeks), 1989.
- Merit List, University of Saugor, 1971.
- Rotary Club Award: Top B.Sc. student, GD College, Damoh, 1969.
- Sanskrit Scholarship, GMHS School, Damoh, 1963-66.
- Named in American Men and Women of Science.

Publications

1 **Books/Chapters**:

1. Y. K. Malaiya, "Freedom of thought and Human Rights in Jain Tradition," in Chapter 8 in Human Rights, Spirituality and Religious Freedom: Perspectives from the Dharmic and Indigenous Cultures, Ed. Y.V. Pathak, A Adityanjee, Kovidnam Vani, 2023, pp. 123-133.
2. J.A. Scheibmeir and Y. K. Malaiya, Social Media Perspectives on Digital Twins and the Digital Twins Maturity Model, Chapter in Digital Twins: Basics and Applications, Eds. Zhihan Lv and Elena Fersman, Springer, 2022, pp. 73-99.
3. Y. K. Malaiya, "Assessing Software Reliability Enhancement Achievable through Testing," in Recent Advancements in Software Reliability Assurance, CRC Press, 2019, p. 107-138.
4. S. C. Jain and Y. K. Malaiya, "Jain Population Predicament: Need to Learn from the Parsi and Jewish Situations," in Studies in Jain Demography, 1881-2011, Ed. P. C. Jain, Rawat Publications 2019, p. 165-172.
5. Y. K. Malaiya, "Software Reliability: A Quantitative Approach," in System Reliability Management: Solutions & Technologies, Ed. Adarsh Anand, CRC Press 2018, pp. 221-252
6. Y. K. Maliaiya, "Interactions among the Dharmic Traditions," in Compassion in the 4 Dharmic Traditions, Editor: Ved P. Nanda, Prabhat Prakashan, Delhi, 2016, pp 70-88.
7. Y. K. Malaiya, "Optimal Reliability Allocation," Wiley Encyclopedia of Operations research and Management Science, John Wiley & Sons, Jan. 2011.
8. Y.K. Malaiya, "Software Reliability Management," Encyclopedia of Library and Information Sciences, Taylor and Francis, Editor: S. Lee, Third Edition, 1: 1, 4901 — 4912, February 2010.
9. Y. K. Malaiya, "Reliability Allocation," Encyclopedia of Statistics in Quality and Reliability, John Wiley & Sons, March 2008, 5 pages.
10. Y. K. Malaiya, "Software Reliability and Security," in Encyclopedia of Library and Information Science, 2005. Y.K. Malaiya,
11. "Software Reliability", Encyclopedia of Library and Information Science, Editors: A. Kent and C.M. Hall, Pub. Marcel Dekker, Inc. 2003, pp. 2688 - 2698.
12. Y.K. Malaiya, "Software Reliability", Encyclopedia of Library and Information Science, Editors: A. Kent and C.M. Hall, Pub. Marcel Dekker, Inc. V. 67, May 2000, pp. 341-357.
13. Y.K. Malaiya, "Automated Test Software", for Wiley Encyclopedia of Electrical and Electronics Engineering, Editor: J.G. Webster, Pub. John Wiley & Sons, Inc. 1999, pp. 135-141.

14. Karunanithi and Y.K. Malaiya, “Neural Networks for Software Reliability”, Chapter in Handbook on Software Reliability Enginering, Ed. M. Lyu, Publisher: McGraw-Hill, 1996. 108. 1
15. Y.K. Malaiya, “Golapurva Anvaya: Eksa Parichaya” (Hindi), in Golapurva Jain Samaj: Itihas evam Sarvekshana ed. Dr. Surendra K. Jain, Pub. Paras Research Inst., Sagar, 1996, pp. 32-44.
16. C.C. Liaw, S.Y.H. Su and Y.K. Malaiya, “Test Generation for Delay Faults using Stuck-at Fault Test Set,” 25th Anniversay Compendium of papers, International Test Conference, 1994, pp. 206-214 (selected for republication).
17. Bridging Faults and IDDQ Testing, Editors: Y.K. Malaiya and R. Rajsuman, IEEE Computer Society Press Technology Series, 1992.
18. Software Reliability Models: Theoretical Development, Evaluation and Applications, Editors: Y.K. Malaiya and P. Srimani, IEEE Computer Society Press Technology Series, 1990.
19. Y.K. Malaiya, “Identification of Golladesh and Gollacharya on the basis of Kuvalayamala-kaha,” in Jaganmohanlal Shastri Felicitation Volume, JML Sadhuvad Samiti, 1990 (in Hindi) pp. 448-454.
20. Y.K. Malaiya, “On the Golapurva Caste” in Vyakaranacharya Banshidhar Felicitation Volume, 1990 (in Hindi), pp. 103-130.
21. C.C. Liaw, S.Y.H. Su and Y.K. Malaiya, “Test Generation for Delay Faults using Stuck-at Fault Test Set,” VLSI Support Technologies: Computer-Aided Design, Testing and Packaging, Ed. Rex Rice, IEEE Computer Society Press, 1982, pp. 281-290 (selected for republication).

2 Patents

1. W.K. AlAssadi, A.P. Jayasumana and Y.K. Malaiya, “IDDQ Testing of Integrated Circuits” Patent granted May 26, 1998.

3 Software Tools

1. ROBUST, An integrated Software Reliability tool. MS Windows, X-Windows, http://www.cs.colostate.edu/testing/robust/.

4 Journals

1 J. Scheibmeir, Y. Malaiya, “Social Media Analytics of the Internet of Things,” Discover Internet of Things, July 19, 2021, 1-16.

2 A. M. Algarni, V. Thayananthan and Y. K. Malaiya “Quantitative Assessment of Cybersecurity Risks for Mitigating Data Breaches in Business Systems” Appl. Sci, 19 April 2021, 11, 3678, pp. 1-24.

3 J. Scheibmeir, Y. Malaiya “Multi-model security and social media analytics of the digital twin,” Advances in Science, Technology and Engineering Systems, vol 5, no. 6, 2020, pp. 323-330.

4 J. Scheibmeir, Y. Malaiya “Contextualization of the Augmented Reality Quality Model through Social Media Analytics,” Advances in Science, Technology and Engineering Systems, vol. 5, no. 4, 2020, pp. 184-191.

5 P. Xiao, Y. Yin, B. Liu, B. Jiang, Y. K. Malaiya, “Adaptive Testing Based on Moment Estimation”, IEEE Trans. on Systems, Man, and Cybernatics: Systems, Dec 2017, pp. 1-12.

6 L. Liu, Y. Yin, Z. Zhang, Y.K. Malaiya, “Redundant Design in Interdependent Networks”, PLOS ONE Vol. 11, October 20, 2016.

7 H. Joh and Y.K. Malaiya, "Periodicity in Software Vulnerability Discovery, Patching and Exploitation", International Journal of Information Security, Nov 2017, pp pp 673–690.

8 A. A. Younis, Y. K. Malaiya, and I. Ray, "Assessing Vulnerability Exploitability Risk Using Software Proprieties", Software Quality Journal, March 2016, Volume 24, Issue 1, pp. 159-202.

9 A. M. Algarni, Y. K. Malaiya,"Software Vulnerability Markets: Discoverers and Buyers," Int. Journal of Computer, Information Science and Engineering, Vol:8 No:3, 2014, pp. 71-81.

10 H. Joh, Y. K. Malaiya, "Modeling Skewness in Vulnerability Discovery", Quality and Reliability Engineering International, Vol. 30, Issue 8, pp. 1445–1459, Dec. 2014.

11 Y.K. Malaiya, "Jain Renaissance of Fifteenth Century", Jain Prachin Tirth Jirnoddhar, Year 10, Number 8, p. 24-26, July 2013.

12 S.-W. Woo, H. Joh, O. H. Alhazmi and Y. K. Malaiya, "Modeling Vulnerability Discovery Process in Apache and IIS HTTP Servers", Computers & Security, Vol. 30, Issue 1, 2011, pp. 50-62.

13 S.H. Wu, S. Jandhyala, Y. K. Malaiya, A. P. Jayasumana, "Antirandom Testing: A Distance Based Approach," VLSI Design, 2008, 9 pages, 2008. doi:10.1155/2008/165709.

14 O. H. Alhazmi and Y. K. Malaiya, "Application of Vulnerability Discovery Models to Major Operating Systems," IEEE Trans. Reliability, March 2008, pp. 14-22.

15 Y. K. Malaiya, "Giants from the Annals of Jain History", Jinamanjari, 37.1, 2008, 3-29.

16 O. H. Alhazmi, Y. K. Malaiya , I. Ray, " Measuring, Analyzing and Predicting Security Vulnerabilities in Software Systems," Computers and Security Journal, Volume 26, Issue 3, May 2007, Pages 219-228.

17 Y.K. Malaiya, N. Li, J. Bieman, R. Karcich, "Software Test Coverage and Reliability," IEEE Trans. Reliability, Dec. 2002, pp. 420-426.

18 Y.K. Malaiya, "Kundalpur's Past Three Centuries," Arhat Vacan, Vol. 13, no. 3-4, 2001 pp. 5-13.

19 S.M. Menon, Y.K. Malaiya, A.P. Jayasumana and C.Q Tong, "Operational and Test Performance in the Presence of Built-in Current Sensors," Int. Journal of VLSI Design, 1997, V. 5, No. 3, pp. 285-298.

20 S.M. Menon, Y.K. Malaiya and A.P. Jayasumana, "ECL Storage Elements: Modeling of Faulty Behavior," IEEE Trans. Circuits & Systems-II, Nov. 1997, pp. 970-974.

21 M. Menon, A. P. Jayasumana and Y. K. Malaiya, "BiCMOS Domino: A Novel High-Speed Dynamic BiCMOS Logic," Int. Journal of Electronics, 1997, V. 83, No. 2, pp. 177-189.

22 S.M. Menon, A.P. Jayasumana and Y.K. Malaiya "Testable Design for BiCMOS Stuck-Open Fault Detection using Single Patterns" IEEE Journal of Solid State Circuits, Aug. 1995, pp. 855-863.

23 S.M. Menon, A.P. Jayasumana and Y.K. Malaiya, "Manifestation of Faults in Single and Double BJT BiCMOS Logic Gates," Proc. IEE, Pt. E, Computers and Digital Techniques, Vol. 142, No. 2, pp. 135-144, March 1995.

24 Y.K. Malaiya, A.P. Jayasumana, Q. Tong and S. Menon, "Resolution Enhancement in IDDQ testing for Large ICs" International Journal of VLSI Design, Vol. 1, No. 4, pp. 277-284.

25 N. Karunanithi, D. Whitley and Y.K. Malaiya, "Prediction of Software Reliability using a Connectionist Approach," IEEE Trans. Software Engineering, Sept. 1992, pp. 563-574.

26 Y.K. Malaiya, "Golahivai and Golladeshadhipa" Arhat-Vachan, 1994 (in Hindi).

27 W.K. Al-Assadi, D. Lu, A.P. Jayasumana, Y.K. Malaiya and C.Q. Tong, "Data Feed-through Faults in circuits using Unclocked Storage Elements," Electronic Letters, Vol. 30, No. 10, May 12, 1994, pp. 764-765.

28 Y.K. Malaiya, A. von Mayrhauser and P. Srimani, "An Examination of Fault Exposure Ratio," IEEE Trans. Software Engineering, Nov. 1993, pp. 1087-1094.

29 S.M. Menon, A.P. Jayasumana, Y.K. Malaiya and D.R. Clinkinbeard, "Modeling and Analysis of Bridging Faults in Emitter-Coupled Logic (ECL) Circuits," IEE Proceedings, Computer and Digital

Techniques, Vol. 140, No. 4, July 1993, pp. 220-226.

30 W. Alassadi, Y.K. Malaiya and A.P. Jayasumana, "Faulty Behavior of Storage Elements and its Effects on Sequential Circuits" IEEE Trans. VLSI Systems, Dec. 1993 pp. 446-452.

31 Y.K. Malaiya, "The Sravakas of Madanasagarpura in the Chandel Period" Anekanta, July-Sept. 1993 (in Hindi).

32 Y.K. Malaiya, N. Karunanithi and P. Verma, "Predictability of Software Reliability Models," IEEE Trans. Reliability, Dec. 1992, pp. 539-546.

33 N. Karunanithi, D. Whitley and Y.K. Malaiya, "Applying Neural Networks to Software Reliability Prediction," IEEE Software, July 1992, pp. 53-59.

34 Y. Min, Y.K. Malaiya and B. Jin, "Analysis of Detection Capability of Parallel Signature Analyzers," IEEE Trans. Computers, Vol. 40, No. 9, Sept. 1991, pp. 1075-1081.

35 A.P. Jayasumana and Y.K. Malaiya and R. Rajsuman, "Design of CMOS Circuits for Stuck-Open Fault Testability," IEEE Journal of Solid State Circuits, Vol. 26, No.1, January 1991, pp. 58-61.

36 A.P. Jayasumana, W. Al-assadi and Y.K. Malaiya, "On Pass Transistor Logic Design," International Journal of Electronics, Vol. 70, No. 4, April 1991, pp. 739-749.

37 S. Feng and Y.K. Malaiya, "Optimization of Test Parallelism with Limited Hardware Overhead," Microelectronics and Reliability, Vol. 31, No. 2, 1991, pp. 271-276.

38 Y.K. Malaiya, "The Sravakas of Golladesh and Gollapura," Anekanta, Vol. 44, No. 1, Jan. 1991, pp. 4-8 (in Hindi).

39 Y. Min, Y.K. Malaiya and B. Jin, "Aliasing errors in parallel signature analyzers," Journal of Computer Science and Technology, V. 5, No. 1, January 1990, pp. 25-40.

40 S.M. Menon, A.P. Jayasumana and Y.K. Malaiya, "Fault Modeling for ECL Devices," Electronic Letters, Vol. 26, N0. 15, July 19, 1990, pp. 1105-1108

41 R. Rajsuman, Y.K.Malaiya and A.P. Jayasumana, "Reprogrammable FPLA with Universal Test Set," Proc. IEE, Vol. 137, Pt. E, No. 6, Nov. 1990, pp 437-441.

42 R. Rajsuman, Y.K. Malaiya and A.P. Jayasumana, "Limitations of Switch Level Analysis for Bridging Faults," IEEE Trans. CAD., Vol. 8, No. 7, July 1989, pp. 807-811.

43 R. Rajsuman, A.P. Jayasumana and Y.K. Malaiya, "CMOS Stuck-open Fault Detection in Presence of Glitches and Timing Skews," IEEE Journal of Solid State Circuits, Vol. 24, No. 4, August 1989, pp. 1055-1061.

44 R. Rajsuman, Y.K. Malaiya and A.P. Jayasumana, "CMOS Stuck-open Fault Testability," IEEE Journal of Solid State Circuits, Vol. 24, No. 1, pp. 193-194, Feb. 1989.

45 Y. Min, Y.K. Malaiya and B. Gupta, "On the Computational Complexity of Test Generation for ETG PLAs," IEE Proceedings Vol. 136, Pt. E, No. 2, March 1989, pp. 107-111.

46 R. Rajsuman, A.P. Jayasumana and Y.K. Malaiya, "On Testing of Complex Gates," Electronic Letters, Vol. 23, No. 16, July 30, 1987, pp. 813-814.

47 Y.K. Malaiya, "Analyzing Data for CMOS Leakage Faults," Microelectronics and Reliability, Vol. 25, No. 5,1985, pp. 943-948.

48 Y.K. Malaiya and R. Narayanaswamy, "Modeling and Testing for Timing Faults in Synchronous Sequential Circuits," IEEE Design and Test of Computers, Vol. 1, No. 4, November 1984, pp. 62-74.

49 Y.K. Malaiya and S.Y.H. Su, "Analysis of an Important Class of Non- Markov Systems," IEEE Trans. Reliability, Vol. R-31, No. 1, April 1982, pp. 64-68.

50 Y.K. Malaiya, "Linearly Correlated Intermittent Failures," IEEE Trans. Reliability, Vol. 31, No. 2, June

1982, pp. 211-215.

51 Y.K. Malaiya and S.Y.H. Su, “Reliability Evaluation for Hardware Redundancy Fault-Tolerant Systems with Intermittent Faults,” IEEE Trans. Computers, Vol. C-30, No. 8, August 1981, pp. 600-604.

52 C.C. Liaw, S.Y.H. Su and Y.K. Malaiya, “Test-Experiments for Detection and Location of Intermittent Faults in Sequential Circuits,” IEEE Trans. Computers, Vol. C-30, No. 12, December 1981, pp. 989-995.

53 S.Y.H. Su, I. Koren, Y.K. Malaiya, “A Continuous Parameter Markov Model and Detection Procedures for Intermittent Faults,” IEEE Trans. Computers, Vol. C-27, No. 6, June 1978, pp. 567-570.

54 Y.K. Malaiya, “An Examination of the Sixteenth Chapter of Vardhamana Purana,” Anekanta, Vol. 27, No. 2, August 1974, pp. 58-64 (in Hindi).

55 Y.K. Malaiya, “On the Golapurvas ,” Anekanta, Vol. 25, No. 2, May 1972, pp. 68-72 (in Hindi).

56 Y.K. Malaiya, “Research Notes,” Anekanta, Vol. 24, No. 5, November 1971, pp. 213-214 (in Hindi).

5 Conferences

1. R. Yeman and Y. K Malaiya, “Agile Scaling Frameworks: A comparison of top 10 most utilized frameworks,” submitted to 6th Int. Conf.e on Information Science and Systems (ICISS 2023).
2. J.A. Scheibmeir and Y. K. Malaiya, “A Social Media-driven Digital Twin of an Invasive Species,” Proceedings of the 10th Int. Work. on Simulation for Energy, Sustainable Development & Environment (SESDE 2022), Sept. 2022. https://doi.org/10.46354/i3m.2022.sesde.002
3. Y.K. Malaiya, "Probabilistic Evaluation of Possible Dates of the Nirvāṇa of Lord Mahāvīra, " Int. Symposium on Dating of Mahavira Nirvan, Navalveerayatan, Pune, July 9-10, 2022.
4. J.A. Scheibmeir and Y. K. Malaiya, “Quality Model for Testing Augmented Reality Applications,” IEEE 10th Ann. Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON), 2019, 219-226.
5. J.A. Scheibmeir and Y. K. Malaiya, “An API Development Model for Digital Twins,”, IEEE 19th International Conference on Software Quality, Security and Security Companion, July 22-26, 2019, pp. 518-519.
6. Y.K. Malaiya, " Health and Self Control in Jainism", Uberoi Foundation Experts Meeting, Denver, October 2019.
7. Y.K. Malaiya, "Freedom of thought and Human Rights in Jain Tradition", Uberoi Foundation Experts Meeting, University of South Florida, Tampa, October 2018.
8. R. Abdunabi and Y.K. Malaiya, “The Impact of Test Case Prioritization on Test Coverage versus Defects Found”, Proc. 2017 Int. Conf. on Software Eng. Research and Practice, pp. 10-15.
9. Y.K. Malaiya, "Dietary Rules in Jainism: A review and Application to Global Society", Perspectives on the Environment and Sustainable Development in the Four Dharmic Traditions, Uberoi Foundation, University of Denver. September 30, 2017.
10. O.H. Alhazmi and Y.K. Malaiya, “A Survey of Disaster Recovery Tiers Schemes”, Proc. 31st Int. Conf. on Comp. and Their Applications (CATA), 2016, pp. 201-206.
11. A. M. Algarni and Y.K. Malaiya, "A Consolidated Approach for Estimation of Data Security Breach Costs", 2nd Int. Conf. on Information Management (ICIM), London, 2016, pp. 26-39.
12. A. Younis, Y. Malaiya and I. Ray, "Evaluating CVSS Base Score Using Vulnerability Rewards Programs",Proc. 31th Int. Information Security and Privacy Conference, IFIP SEC, Ghent, Belgium,

2016, pp. 62-75.

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14. A. Younis and Y.K. Malaiya, "Comparing and Evaluating CVSS Base Metrics and Microsoft Rating System", The 2015 IEEE Int. Conf. on Software Quality, Reliability and Security, pp. 252-261.
15. A. A. Younis, Y. K. Malaiya, and I. Ray, "Using Attack Surface Entry Points and Reachability Analysis to

    Assess the Risk of Software Vulnerability Exploitability", Proc. 2014 IEEE 15th International Symposium on High-Assurance Systems Engineering (HASE 2014), Miami, January, 2014, pp. 1-8.
16. O.H. Alhazmi and Y.K. Malaiya, “Are the Classical Disaster Recovery Tiers Still Applicable Today?”, Proc. Int. Symp. Software Reliability Eng. Workshops, (ISSREW), pp. 114-115, Nov. 2014.
17. A. Younis, Y.K. Malaiya, "Using Software Structure to Predict Vulnerability Exploitation Potential," Int. Conf. on Software Security and Reliability-Companion (SERE-C), pp.13-18, June 30-July 2 2014.
18. Y. K. Malaiya, “Interactions among Dharmic Traditions: with emphasis on Jainism, Buddhism and Hinduism,” Uberoi Foundation Experts Meeting, Naropa University, Boulder, Sept 13, 2014.
19. A. M. Algarni, and Y. K. Malaiya, "Most Successful Vulnerability Discoverers: Motivation and Methods", Int. Conference on Security and Management (SAM 2013), Las Vegas, July 2013, pp. 3-9.
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20. Y.K. Malaiya, ''The incredible journey of the 1904 St.Louis Jain temple", Jain Center of Central Ohio Pratishtha Sovenier, July 2012, pp. 81-84.
21. Y.K. Malaiya, ''As Mumbai Godiji temple celebrates, silence shrouds its predecessor in Pakisthan", Jain Center of Central Ohio Pratishtha Sovenier, July 2012, pp. 110-112. Also published in Express Herald Tribune, Karachi, May 18, 2012.
22. Y.K. Malaiya, The bridge from Ganesh Varni to Our times, Pahali anupasthiti, Ed. Narendraprakash Jain, Sarojkumar, Satna, p. 25-27, Oct 31, 2013.
23. Y.K. Malaiya, "Jainism: Principles, People, Heritage, Influences", Uberoi Foundation Denver Teacher Training Program, May 2018.
24. Y.K. Malaiya, "Navagarh Antiquities from the Chandel Period, " Jain Tirth Vandana, February 2021, pp. 7-9.
25. Y.K. Malaiya, Introduction, Nainagiri Jain Tirth, Puratan se Adyatan, Ed. Suresh Jain, Vimala Jain, 2022, pp. xiv-xvii.

8 Unpublished Technical Reports

1 P. Wang and Y.K. Malaiya, "Can Anti-random Beat Random Testing? Evaluation from the Randomness Perspective," Tech Report, 2004.

2 C.V. Gupte, A.P. Jayasumana and Y.K. Malaiya, "State Space Exploration of Sequential Circuits for Black-Box testing," Tech. Report, 2003.

3 A.S. Banthia, A.P. Jayasumana and Y.K. Malaiya, "Data-size Reduction for Clustering based Binning of ICs using Principal Component Analysis," Tech. Report, 2003.

9 Theses

1. "On Graph-Theoretic Basis for Network Synthesis," M.S. Thesis, Electrical and Electronics Engineering Department, Birla Institute of Technology and Science, Pilani, 73 pages, 1974.
2. "Modeling, Testing and Reliability Analysis of Digital Systems with Intermittent Faults," Ph.D. Dissertation, Department of Electrical Engineering, Utah State University, Logan, 155 pages, 1978.

10 Tutorials/Keynotes

1. Yashwant K. Malaiya, "Quantitative Cyber-Security - Challenges & Advances," Recent Advances in

Computer Science & Engineering, Eklavya University, July 2022.

2. Yashwant K. Malaiya "Wholistic Engineering for Software Reliability", Int. Symp. Software Reliability Engineering, 2000.
3. Yashwant K. Malaiya, "Embedded Software Testing", 35th IEEE VLSI Test Symposium, (VTS 2017), April 2017.

11 Invention Disclosures

1. "Single Pattern Testable CMOS (SPT-CMOS) Logic Gates," by R. Rajsuman, A.P. Jayasumana and Y.K. Malaiya, 1988.
2. "TCMOS: Testable CMOS Logic Gates, " by A.P. Jayasumana, Y.K. Malaiya, R. Rajsuman, 1989.
3. "A Design for Testability scheme for detection of stuck-open faults in single BJT BiCMOS Logic devices." S.M. Menon, Y.K. Malaiya and A.P. Jayasumana, 1992.
4. "BiCMOS Domino: A Novel High-Speed Dynamic BiCMOS Logic Family," A.P. Jayasumana, Y.K. Malaiya and S.M. Menon, 1993
5. "Identification and Binning of Faulty ICs Using Principal Component Analysis," A. Sharma, A.P. Jayasumana and Y.K. Malaiya, 2005.

12 **Advising: Graduate committees** (partial list)

I have advised more than 70 graduate students and have served on the committees for more than 250 graduate students at Colorado State University.

Ph.D. students supervised:

1. Rochit Rajsuman, 1988, Analysis, Modeling and Testing of Major Failure Modes in MOS VLSI (co-ad. A. P. Jayasumana), Case Western Reserve, Advantest (17 joint publications)
2. Sheng Feng, 1992, Evaluation of Detectability in Built-in-self-test Environment, Hanus Co. (2 joint publications)
3. Michael Naixin Li, 1993, Towards Better Predictability of Software Reliability Growth Models, Microsoft, (9 joint publications)
4. Sankaran M Menon, 1994, Modeling of Faults and Design for Testability of Bipolar/MOS VLSI (co-ad. A. P. Jayasumana), Intel, (23 joint publications)
5. Waleed K Al-Assadi, 1996, Faulty Behavior and Testability of Sequential Circuits and Memory Arrays (co-ad A. P. Jayasumana) (11 joint publications)
6. Omar Alhazmi, 2007, Assessing Vulnerabilities in Software Systems: A Quantitative Approach (co-ad Indrajit Ray), Taibah University (11 joint publications)
7. HyunChul Joh, 2011, Quantitative analyses of software vulnerabilities, Kyungil University, (10 joint publications)
8. Awad Younis, 2016, Software Security Metrics and Malicious Activity Analysis and Detection, Georgia State University (8 joint publications)
9. Abdullah Algarni, 2016, Quantitative Economics of Security: Software Vulnerabilities and Data Breaches, King Abdulaziz University (4 joint publications)
10. Jim Scheibmeir, 2021, Quality Attributes of Digital Twins, Gartner (6 joint publications)
11. Robin Yeman, continuing (one joint paper submitted).

12. Mayur Thumma, continuing.

The list below lists the graduate students who have finished (since 2003 only).

Ph.D.(as committee member) : Hossein Shirazi, , KM Mozammel Hossain, Sai Vineel Reddy R Chittamuru, Ibrahim Lazrig, Mustafa Al-Lail, Mozammel Hossain, Sai Vineel Reddy Chittamuru, Mustafa Al-Lail, Kiril Belyaev, Negar Mosharraf Ghahfarokhi, Lijun Yu, Wedyan, Fadi Ibrahim , Abdunabi, Ramadan Farag, Fahad Al Zahrani, Zhou Dacheng, Abdulgader Habibulla, Alkan Cengiz, Ayman Fayumi, C.R. Rose, Dan Vivanco, Dinh Trong Trung, H Nasser, Huxia Wang, Nischal Piratla, J S Tamez, Pan Ho Lee, Henry Dittmer, Sudip Chakraborty, Woo Sung-whan, Sangeeta Bangalore, Yoong Goog Cho.

M.S. (as advisor/coadvisor): Ujwal Srinivasa , Awad Younis, Abraham Daniel, Jiao Chen, Kishore Siddha Reddy, Sai Balbhadrapatruni, Sung-Whan Woo, Jinyoo Kim, Manja Prasanna, V R Parakala, Chinmay Gupte, Ritesh Turakhia, Ashutosh Sharma, Udaya Sajja.

M.S. (as committee member): Shruthi Viswanatha, Hossein Shirazi, Gunjan Shrikrishna Mahindre, Ramesh, Pushpaak, Rahul Rajeev Nair, Pritam Shirish Shah, Shenghong Fu, Priyanka R. Dumbre, Alodeep Sanyal, Vaibhav Nawale, Aditya Maroo, Kranthi Bodepudi, B Kumaraswami, Mageshkumar Kuppusamy, Michael Steigerwald, Ramanathan Sivakumar, Sudha Govindaswamy, Mehak Chopra, Supriya Sukumaran, Gerald Esch, Rohit Joshi, Praveen Moses, Sonja Tideman, Vinil Vargese, Ashish Mehta, Narasiodeyar Raghunandan Mandyam, Saket Sham Doshi.

13 Department/College Committees

Partial list:

Operations Committee (Chair 2021-23, member 2017-2019),

Faculty Search Committee (Chair 2022-23),

Cyber Security Center Tech (Member 2019-20)

GTA Assignment (member 2019-20),

Grad Recruitment committee (member 2020-22, 2018-19),

Grad Appeals Committee (member 2021-22)

Promotion and Tenure committee (Continuous since tenure)

Faculty Council etc.

14 Funded Projects (as principal investigator)

- Modeling, Testing and Fault-tolerant Design of Digital Systems with Intermittent Faults, National Science Foundation, 1979-1981, $110,006, (with S.Y.H. Su)
- Testability for VLSI , Rome Air Development Center, 1981-1982, $40,000, (with S.Y.H. Su)
- Functional Testing of LSI/VLSI based Systems with Measures of Fault Coverage , Department of the Army (USACECOM) 1982-1984, $158,808, (with S.Y.H. Su), associated until August 1982.
- Reliability Management Through Self-Testing, Office of Naval Research (SDIO/IST), 1986-1988, $271,198,

- Reliability Management Through Self-Testing, (Renewal), Office of Naval Research (SDIO/IST) 1989-1991, $269,518.
- Reliability Management Through Testing, Office of Naval Research (SDIO/IST) 1992-1996, $317,618
- Achieving Ultra High Reliability in Critical Systems, Office of Naval Research (BMDO), 1996-1999 $272,990
- An Integrated Software Reliability Tool, (ONR/AASERT), 1996-1999 $108,424
- Achieving Introducing Computer Science, A Summer Program, Colorado Institute of Technology, 2001, $20,000 (with S. Ghosh and S. Schleiffers)