

Curriculum Vitae

Roger Mark Kieckhafer

Dept of Electrical and Computer Engineering
121 Electrical Energy Resources Center
Michigan Technological University
Houghton, MI 49931 - 1295

Email: rmkieckh@mtu.edu
Voice: +001-906-487-2866
Fax: +001-906-487-2949

Research Interests

Fault-tolerant distributed systems; safety-critical real-time systems; voting, agreement, and clock synchronization; reliable communication; performance and dependability modeling; real-time scheduling; computer architecture.

Education

- **PhD, Electrical Engineering:** Cornell University, Aug 1983. Dissertation: Development of a Processor Array Architecture for Application to Circuit Simulation, Advisor: C. Pottle.
- **MS, Electrical Engineering:** Cornell University, May 1982. Thesis: Application of the AP-120B Array Processor to the Treatment of Long-Range Interactions in Polypeptides.
- **BS, Nuclear Engineering:** University of Wisconsin, May 1974.

Employment

- **Associate Professor,** Electrical and Computer Engineering Dept., Michigan Technological University, Aug 2000 – Present.
- **Associate Chair for Computer Engineering,** Electrical and Computer Engineering Dept., Michigan Technological University, Aug 2000 – May 2008.
- **Vice Chair and Accreditation Coordinator,** Dept. of Computer Science and Engineering, University of Nebraska - Lincoln, May 1998 – Dec 1999.
- **Associate Professor,** Dept. of Computer Science and Engineering, University of Nebraska - Lincoln, Aug 1993 – Aug 2000.
- **Assistant Professor,** Dept. of Computer Science and Engineering, University of Nebraska - Lincoln, Aug 1987 – Aug 1993.
- **Member of Technical Staff,** Systems Integration and Reliability Group, Allied-Signal Aerospace Technology Center, Columbia, MD, Jun 1983 – Jul 1987.

Journal Articles

1. Amlan Mukherjee, Yonglian Jin, Dana Johnson, Roger Kieckhafer, "Using Situational Simulations to Support Decision Making in Co-dependent Infrastructure Systems", *Int'l. J. of Critical Infrastructure*, (to appear).
2. M.H. Azadmanesh and R.M. Kieckhafer, "Asynchronous Approximate Agreement in Partially Connected Networks", *Int'l Journal of Parallel and Distributed Systems & Networks*, vol. 5, no. 1, 2002, pp. 26-34.
3. M.H. Azadmanesh and R.M. Kieckhafer, "Exploiting Omissive Faults in Synchronous Approximate Agreement", *IEEE Trans. Computers*, vol. 49, no. 10, Oct 2000, pp. 1031-1042.
4. Y. Xue, R.M. Kieckhafer, and F.F. Choobineh "Automated Construction of GSPN Models for Flexible Manufacturing Systems", *Computers in Industry*, vol. 37, 1998, pp. 17-25.
5. J.S. Deogun, R.M. Kieckhafer, and A.W. Krings, "Stability and Performance of List Scheduling with External Process Delays", *Real-Time Systems Journal*, vol. 15, no. 1, Jul 1998, pp. 5-38.
6. M.H. Azadmanesh, and R.M. Kieckhafer "New Hybrid Fault Models for Asynchronous Approximate Agreement", *IEEE Trans. Computers*, vol. 45, no. 4, Apr 1996, pp. 439-449.
7. R.M. Kieckhafer and M.H. Azadmanesh, "A Unified Approach to Synchronous and Asynchronous Approximate Agreement in the Presence of Hybrid Faults", *IEEE Trans. Reliability*, vol. 44, no. 4, Dec 1995, pp. 622-31.
8. A.W. Krings, R.M. Kieckhafer, and J.S. Deogun, "Inherently Stable Real-Time Priority List Dispatchers", *IEEE Parallel and Distrib. Technology*, vol. 2, no. 4, Winter 1994, pp. 49-59.
9. R.M. Kieckhafer and M.H. Azadmanesh, "Reaching Approximate Agreement With Mixed-Mode Faults", *IEEE Trans Parallel and Distrib. Systems*, vol. 5, no. 1, Jan 1994, pp. 53-63.
10. R.M. Kieckhafer and M.H. Azadmanesh, "Low Cost Approximate Agreement in Partially Connected Networks", *Journal of Computing and Information*, vol. 3, no. 2, 1993.
11. R.M. Kieckhafer, C.J. Walter, A.M. Finn, and P.M. Thambidurai, "The MAFT Architecture for Distributed Fault-Tolerance", *IEEE Trans. Computers*, vol. C-37, no. 4, Apr 1988, pp. 398-405.

Conference Papers

1. Dana Johnson, Roger Kieckhafer, Amlan Mukherjee, Leonard Bohmann, Chunxiao Chigan, "A Conceptual Framework for Integrated Stochastic Modeling of Multi-Dependent Systems", *19th Ann. Conf. of the Production and Operations Mgmt Soc. (POMS 2008)*, May 9-12, 2008.
2. Jin Sun, PJ Weber, BK Choi, RM Kieckhafer, "DIMPLE: DynamIc Membership ProtocoL for Epidemic protocols", *Proc. IEEE 4th Int'l Conf on Broadband Comm, Networks, and Systems (BROADNETS 2007)*, Sep, 2007.

3. RM Kieckhafer, P Mishra, J Tan, C Chigan, "A New Paradigm for Reliable Hard-Real-Time WSNs", *IEEE Real-Time Systems Symposium (RTSS-06), Work in Prog. Session*, Dec 2006.
4. R.M. Kieckhafer, "Adapting Failure Modes and Effects Analysis (FMEA) Methodology to Outcomes Assessment", *Best Assessment Processes Symp VII*, Apr 8-9, 2005.
5. R.M. Kieckhafer, "The Effective Use of Prerequisite Review Exams for Outcomes Assessment", *Best Assessment Processes Symp VII*, Apr 8-9, 2005.
6. S. Goddard, R. Kieckhafer, Y. Zhang, "An Unavailability Analysis of Firewall Sandwich Configurations", *Proc. 6th IEEE High Assurance Systems Eng'g. Symp. (HASE 2001)*, Oct 22-24, 2001.
7. R.M. Kieckhafer, M.H. Azadmanesh, and Y. Hui, "On the Sensitivity of NMR Unreliability to Non-Exponential Repair Distributions", *Proc. 5th IEEE High Assurance Systems Eng'g. Symp. (HASE 2000)*, Oct 15-17, 2000.
8. B.K. den Hartog, J.W. Elling, and R.M. Kieckhafer, "The SI-Combiner: Making Sense of Results from Multiple Trained Programs", *Lab Automation '99*, San Diego, CA, Feb, 1999.
9. B.K. den Hartog, J.W. Elling, and R.M. Kieckhafer, "The SI-Combiner: Making Sense of Results from Multiple Trained Programs", *Proc. 4th Joint Conf on Information Sciences*, Research Triangle Park, NC, Oct 1998.
10. R.M. Kieckhafer, and A.W. Krings, "The Impact of Phantom Tasks on Scheduling in Manufacturing Systems", *9th Annual Production and Operations Management Society Conf (POMS-98)*, Santa Fe, NM, Mar 1998.
11. R.M. Kieckhafer, J.S. Deogun, A.W. Krings, L.R. Dondeti, and B.N. Masti, "Efficiency vs. Stability in Non-Preemptive Schedules", *2nd Dagstuhl Seminar on Scheduling in Computer and Manufacturing Systems*, Schloss Dagstuhl, Germany, Jun 1997.
12. B.K. den Hartog, J.W. Elling, S.M. Mniszewski, and R.M. Kieckhafer, "Learning from Multiple Models to Integrate Sensed Data", *Proc. AAAI Workshop on Integrating Multiple Learned Models for Improving Machine Learning Algorithms*, Portland, OR, Aug 1996.
13. R. M. Kieckhafer, and M.H. Azadmanesh, "Hybrid Fault Models: Have We Reached the Limit?", *Dagstuhl Seminar on Time Services*, Schloss Dagstuhl, Germany, Mar 1996.
14. R.M. Kieckhafer, F.F. Choobineh, and Y. Xue, "Using Automatically Generated GSPNs for Performability Modeling of Flexible Manufacturing Systems", *1st Dagstuhl Seminar on Scheduling in Computer and Manufacturing Systems*, Schloss Dagstuhl, Germany, May 1995.
15. A.W. Krings and R.M. Kieckhafer, "Inherently Stable Priority List Schedulers for Systems with External Delays", *Proc. 26th Hawaii Int'l Conf on System Sciences*, Jan 1993.
16. R.M. Kieckhafer and M.H. Azadmanesh, "Fault-Tolerant Convergent Voting in Large Sparsely Connected Networks", *Proc. 1992 Complex Systems Engineering Synthesis and Assessment Technology Workshop*, Jul 1992, pp. 31-51.

17. R.M. Kieckhafer, "Design of a Fault-Tolerant Computer System", *Proc. NASA Formal Methods Workshop, 1990*, NASA Conf Pub. 10052, Aug 1990, pp. 94-145.
18. P.M. Thambidurai, A.M. Finn, R.M. Kieckhafer, and C.J. Walter, "Clock Synchronization in MAFT", *Proc, 19th Int'l Symp on Fault-Tolerant Computing (FTCS-19)*, Jun 1989, pp. 142-149.
19. R.M. Kieckhafer, "Fault-Tolerant Real-Time Task Scheduling in the MAFT Distributed System", *Proc, 22nd Hawaii Int'l Conf on System Sciences*, Jan 1989, pp. 143-151.
20. R.M. Kieckhafer, "Task Reconfiguration in a Distributed Real-Time System", *Proc, 8th IEEE Real-Time Systems Symposium (RTSS-8)*, Dec 1987, pp. 25-32.
21. C.J. Walter, R.M. Kieckhafer, and A.M. Finn, "MAFT: A Multicomputer Architecture for Fault-Tolerance in Real-Time Control Systems", *Proc, 6th IEEE Real-Time Systems Symposium (RTSS-6)*, Dec 1985, pp. 133-140.
22. R.M. Kieckhafer and C. Pottle, "A Clustered Processor Array for the Solution of Unstructured Sparse Matrix Equations", *Proc, IEEE Int'l Symposium on Circuits and Systems*, May 1983, pp. 214-217.
23. R.M. Kieckhafer and C. Pottle, "A Processor Array for Factorization of Unstructured Sparse Matrices", *Proc, IEEE Int'l Conf on Circuits and Computers*, Oct 1982, pp. 380-383.

Patents

1. R.M. Kieckhafer, A.M. Finn, and C.J. Walter, *A Task Scheduler for a Fault-Tolerant Multiple Node Processing System*, U.S. Patent No. 4,805,107, Feb. 14, 1989.
2. A.M. Finn, R.M. Kieckhafer, and C.J. Walter, *A Synchronizer for a Fault-Tolerant Multiple Node Processing System*, U.S. Patent No. 4,816,989, Mar 28, 1989.
3. C.J. Walter, R.M. Kieckhafer, and A.M. Finn, *An Operations Controller for a Fault-Tolerant Multiple Node Processing System*, U.S. Patent No. 4,914,657, Apr 3, 1990.
4. C.J. Walter, R.M. Kieckhafer, and A.M. Finn, *A Fault Tolerator for a Fault-Tolerant Multiple Node Processing System*, U.S. Patent No. 4,933,940 Jun 12, 1990.
5. C.J. Walter, R.M. Kieckhafer, and A.M. Finn, *A Voter for a Fault-Tolerant Multiple Node Processing System*, U.S. Patent No. 4,972,415, Nov 20, 1990.
6. C.J. Walter, R.M. Kieckhafer, and A.M. Finn, *A Task Communicator for a Fault-Tolerant Multiple Node Processing System*, U.S. Patent No. 4,980,857, Dec 25, 1990.