## **Bibliography**

- S. U. Ahmad and S. K. Sardar, "Fuzzy variable linear programming with fuzzy technical coefficients", *Pakistan Journal of Statistics and Operation Research*, vol. 8, no. 4, pp. 839–847, 2012.
- [2] W. Ahmad, O. Hasan, U. Pervez, and J. Qadir, "Reliability modeling and analysis of communication networks", *Journal of Network and Computer Applications*, vol. 78, pp. 191–215, 2017.
- [3] S. M. Akkapeddi, "Fuzzy programming with quadratic membership functions for multi-objective transportation problem", *Pakistan Journal of Statistics and Operation Research*, vol. 11, no. 2, pp. 231–240, 2015.
- [4] S. C. Albright, "Optimal maintenance-repair policies for the machine repair problem", *Naval Research Logistics Quarterly*, vol. 27, no. 1, pp. 17–27, 1980.
- [5] S. Alizadeh and S. Sriramula, "Impact of common cause failure on reliability performance of redundant safety related systems subject to process demand", *Reliability Engineering & System Safety*, vol. 172, pp. 129–150, 2018.
- [6] M. Amiri and F. Ghassemi Tari, "A methodology for analyzing the transient reliability of systems with identical components and identical repairmen", *Scientia Iranica*, vol. 14, no. 1, pp. 72–77, 2007.
- [7] S. I. Ammar, "Transient analysis of an *M*/*M*/1 queue with impatient behavior and multiple vacations", *Applied Mathematics and Computation*, vol. 260, pp. 97–105, 2015.
- [8] S. I. Ammar, "Transient behavior of a two-processor heterogeneous system with catastrophes, server failures and repairs", *Applied Mathematical Modelling*, vol. 38, no. 7-8, pp. 2224–2234, 2014.
- [9] J. R. Artalejo, "G-networks: A versatile approach for work removal in queueing networks", *European Journal of Operational Research*, vol. 126, no. 2, pp. 233–249, 2000.

- [10] M. Aslam, M. Tahir, and Z. Hussain, "Reliability analysis of three-component mixture of distributions", *Scientia Iranica Transaction E: Industrial Engineering*, vol. 25, no. 3, pp. 1768–1781, 2018.
- [11] I. Atencia and P. Moreno, "The discrete-time Geo/Geo/1 queue with negative customers and disasters", Computers & Operations Research, vol. 31, no. 9, pp. 1537–1548, 2004.
- [12] P. Azimi, M. Hemmati, and A. Chambari, "Solving the redundancy allocation problem of k-out-of-n with non-exponential repairable components using optimization via simulation approach", *Scientia Iranica Transaction E: Industrial Engineering*, vol. 24, no. 3, pp. 1547–1560, 2017.
- [13] Y. Baba, "The *M*/*PH*/1 queue with working vacations and vacation interruption", *Journal of Systems Science and Systems Engineering*, vol. 19, no. 4, pp. 496–503, 2010.
- [14] D. Barrer, "Queues, inventories and maintenance (Philip M. Morse)", SIAM Review, vol. 1, no. 2, pp. 186–187, 1959.
- [15] H. Baumann and W. Sandmann, "Steady state analysis of level dependent quasi-birth-and-death processes with catastrophes", *Computers & Operations Research*, vol. 39, no. 2, pp. 413–423, 2012.
- [16] R. E. Bellman and L. A. Zadeh, "Decision-making in a fuzzy environment", *Management science*, vol. 17, no. 4, B141–B164, 1970.
- [17] C. G. Broyden, "A class of methods for solving nonlinear simultaneous equations", *Mathematics of computation*, vol. 19, no. 92, pp. 577–593, 1965.
- [18] J. J. Buckley, T. Feuring, and Y. Hayashi, "Fuzzy queueing theory revisited", *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems*, vol. 9, no. 5, pp. 527–537, 2001.
- [19] J. Buckley, "Elementary queueing theory based on possibility theory", *Fuzzy sets and Systems*, vol. 37, no. 1, pp. 43–52, 1990.
- [20] G. Bura and R. Kumar, "Transient analysis of a limited capacity Markovian queueing system subjected to varying catastrophic intensity and restoration", *American Journal of Operational Research*, vol. 3, pp. 34–43, 2013.
- [21] V. M. Chandrasekaran, K. Indhira, M. C. Saravanarajan, and P. Rajadurai, "A survey on working vacation queueing models", *International Journal of Pure and Applied Mathematics*, vol. 106, no. 6, pp. 33–41, 2016.

- [22] F. M. Chang, T. H. Liu, and J. C. Ke, "On an unreliable-server retrial queue with customer feedback and impatience", *Applied Mathematical Modelling*, vol. 55, pp. 171–182, 2018.
- [23] X. Chao, "A queueing network model with catastrophes and product form solution", *Operations Research Letters*, vol. 18, no. 2, pp. 75–79, 1995.
- [24] S. P. Chen, "Parametric nonlinear programming for analyzing fuzzy queues with finite capacity", *European Journal of Operational Research*, vol. 157, no. 2, pp. 429–438, 2004.
- [25] S. P. Chen, "Solving fuzzy queueing decision problems via a parametric mixed integer nonlinear programming method", *European Journal of Operational Research*, vol. 177, no. 1, pp. 445–457, 2007.
- [26] S. P. Chen, "Non-linear programming for the optimization of machine repair problems in fuzzy environments", *Engineering Optimization*, vol. 38, no. 7, pp. 789–799, 2006.
- [27] S. P. Chen, "A mathematical programming approach to the machine interference problem with fuzzy parameters", *Applied Mathematics and Computation*, vol. 174, no. 1, pp. 374–387, 2006.
- [28] W. L. Chen, "System reliability analysis of retrial machine repair systems with warm standbys and a single server of working breakdown and recovery policy", *Systems Engineering*, vol. 21, no. 1, pp. 59–69, 2018.
- [29] J. Cheng, Y. Tang, and M. Yu, "The reliability of solar energy generating system with inverters in series under common cause failure", *Applied Mathematical Modelling*, vol. 68, pp. 509–522, 2019.
- [30] B. D. Choi and K. K. Park, "The *M/G/1* retrial queue with Bernoulli schedule", *Queueing systems*, vol. 7, no. 2, pp. 219–227, 1990.
- [31] B. D. Chol and D. H. Han, "G/M<sup>(a,b)</sup>/1 queues with server vacations", *Journal of the Operations Research Society of Japan*, vol. 37, no. 3, pp. 171–181, 1994.
- [32] D. R. Cox, "The analysis of non-Markovian stochastic processes by the inclusion of supplementary variables", vol. 51, no. 3, pp. 433–441, 1955.
- [33] W. Davidson, "Variable metric method for minimization", *SIAM Journal on Optimization*, vol. 1, no. 1, pp. 1–17, 1991.
- [34] C. De Mulatier, E. Dumonteil, A. Rosso, and A. Zoia, "The critical catastrophe revisited", *Journal of Statistical Mechanics: Theory and Experiment*, vol. 2015, no. 8, P08021, 2015.

- [35] S. Dharmaraja and R. Kumar, "Transient solution of a Markovian queueing model with heterogeneous servers and catastrophes", *OPSEARCH*, vol. 52, no. 4, pp. 810–826, 2015.
- [36] S. Dharmaraja, A. Di Crescenzo, V. Giorno, and A. G. Nobile, "A continuoustime ehrenfest model with catastrophes and its jump-diffusion approximation", *Journal of Statistical Physics*, vol. 161, no. 2, pp. 326–345, 2015.
- [37] A. Di Crescenzo, V. Giorno, A. G. Nobile, and L. M. Ricciardi, "On the M/G/1 queue with catastrophes and its continuous approximation", *Queue*ing Systems, vol. 43, no. 4, pp. 329–347, 2003.
- [38] S. Dimou and A. Economou, "The single server queue with catastrophes and geometric reneging", *Methodology and Computing in Applied Probability*, vol. 15, no. 3, pp. 595–621, 2013.
- [39] M. A. El Damcese and M. S. Shama, "Reliability and availability analysis of a standby repairable system with degradation facility", *International Journal* of Research and Reviews in Applied Sciences, vol. 16, no. 3, pp. 501–507, 2013.
- [40] S. Eryilmaz, "(k<sub>1</sub>, k<sub>2</sub>,..., k<sub>m</sub>)-out-of-n system and its reliability", *Journal of Computational and Applied Mathematics*, vol. 346, pp. 591–598, 2019.
- [41] H. Fazlollahtabar and S. J. Naini, "Adapted Markovian model to control reliability assessment in multiple AGV manufacturing system", *Scientia Iranica Transaction E: Industrial Engineering*, vol. 20, no. 6, pp. 2224–2237, 2013.
- [42] A. E. Ferdinand, "An analysis of the machine interference model", *IBM Systems Journal*, vol. 10, no. 2, pp. 129–142, 1971.
- [43] R. Fletcher and M. J. Powell, "A rapidly convergent descent method for minimization", *The computer journal*, vol. 6, no. 2, pp. 163–168, 1963.
- [44] P. Fortemps and M. Roubens, "Ranking and defuzzification methods based on area compensation", *Fuzzy sets and systems*, vol. 82, no. 3, pp. 319–330, 1996.
- [45] T. Gal, Postoptimal Analyses, Parametric Programming, and Related Topics: degeneracy, multicriteria decision making, redundancy. Walter de Gruyter, 2010.
- [46] S. Gao, J. Wang, and W. W. Li, "An M/G/1 retrial queue with general retrial times, working vacations and vacation interruption", Asia-Pacific Journal of Operational Research, vol. 31, no. 2, pp. 1440006–25, 2014.

- [47] H. Garg, "Novel intuitionistic fuzzy decision making method based on an improved operation laws and its application", *Engineering Applications of Artificial Intelligence*, vol. 60, pp. 164–174, 2017.
- [48] H. Garg, "Performance analysis of complex repairable industrial systems using PSO and fuzzy confidence interval based methodology", *ISA transactions*, vol. 52, no. 2, pp. 171–183, 2013.
- [49] H. Garg and Ansha, "Arithmetic operations on generalized parabolic fuzzy numbers and its application", *Proceedings of the national academy of sciences, India section A: Physical sciences*, vol. 88, no. 1, pp. 15–26, 2018.
- [50] H. Garg, "Some arithmetic operations on the generalized sigmoidal fuzzy numbers and its application", *Granular computing*, vol. 3, no. 1, pp. 9–25, 2018.
- [51] H. Garg, "Some picture fuzzy aggregation operators and their applications to multicriteria decision-making", *Arabian Journal for Science and Engineering*, vol. 42, no. 12, pp. 5275–5290, 2017.
- [52] R. Ghasemi, M. Nikfar, and E. Roghanian, "A revision on area ranking and deviation degree methods of ranking fuzzy numbers", *Scientia Iranica Transaction E: Industrial Engineering*, vol. 22, no. 3, pp. 1142–1154, 2015.
- [53] V. Giorno, A. G. Nobile, and S. Spina, "On some time non-homogeneous queueing systems with catastrophes", *Applied Mathematics and Computation*, vol. 245, pp. 220–234, 2014.
- [54] V. Goswami, "Analysis of discrete-time queue with two heterogeneous servers subject to catastrophes", TWMS Journal of Applied and Engineering Mathematics, vol. 4, no. 2, pp. 234–251, 2014.
- [55] D. Gross, Fundamentals of queueing theory. John Wiley & Sons, 2008.
- [56] N. Gupta, I. Ali, and A. Bari, "Fuzzy goal programming approach in selective maintenance reliability model", *Pakistan Journal of Statistics and Operation Research*, vol. 9, no. 3, pp. 321–331, 2013.
- [57] U. C. Gupta and T. S. V. Rao, "On the *M/G/1* machine interference model with spares", *European Journal of Operational Research*, vol. 89, no. 1, pp. 164–171, 1996.
- [58] U. C. Gupta and T. S. V. Rao, "A recursive method to compute the steady state probabilities of the machine interference model:(M/G/1)/K", *Computers & operations research*, vol. 21, no. 6, pp. 597–605, 1994.

- [59] L. Haque and M. J. Armstrong, "A survey of the machine interference problem", *European Journal of Operational Research*, vol. 179, no. 2, pp. 469– 482, 2007.
- [60] P. Hokstad, "A supplementary variable technique applied to the M/G/1 queue", *Scandinavian Journal of Statistics*, pp. 95–98, 1975.
- [61] C. A. Holloway, *Decision making under uncertainty: Models and choices*. Prentice Hall, 1979.
- [62] Y. C. Hsieh and K. H. Wang, "Reliability of a repairable system with spares and a removable repairman", *Microelectronics Reliability*, vol. 35, no. 2, pp. 197–208, 1995.
- [63] Y. L. Hsu, J. C. Ke, T. H. Liu, and C. H. Wu, "Modeling of multi-server repair problem with switching failure and reboot delay and related profit analysis", *Computers & Industrial Engineering*, vol. 69, pp. 21–28, 2014.
- [64] H. I. Huang and J. C. Ke, "Comparative analysis on a redundant repairable system with different configurations", *Engineering Computations*, vol. 26, no. 4, pp. 422–439, 2009.
- [65] H. I. Huang, C. H. Lin, and J. C. Ke, "Parametric nonlinear programming approach for a repairable system with switching failure and fuzzy parameters", *Applied Mathematics and Computation*, vol. 183, no. 1, pp. 508–517, 2006.
- [66] W. Huang, J. Loman, and T. Song, "A reliability model of a warm standby configuration with two identical sets of units", *Reliability Engineering & System Safety*, vol. 133, pp. 237–245, 2015.
- [67] K. J. Bin, C. J. Wei, and W. K. Hsiung, "Reliability measures of a repairable system with standby switching failures and reboot delay", *Quality Technol*ogy & *Quantitative Management*, vol. 8, no. 1, pp. 15–26, 2011.
- [68] M. Jain, "Reliability prediction of repairable redundant system with imperfect switching and repair", *Arabian Journal for Science and Engineering*, vol. 41, no. 9, pp. 3717–3725, 2016.
- [69] M. Jain and K. P. S. Baghel, "A multi-components repairable problem with spare and state dependent rates", *The Nepali Mathematical Sciences Report*, vol. 19, pp. 81–92, 2001.
- [70] M. Jain, G. C. Sharma, and R. S. Pundhir, "Some perspectives of machine repair problems", *International Journal of Engineering*, vol. 23, no. 3, pp. 253– 268, 2010.

- [71] M. Jain, C. Shekhar, and S. Shukla, "N-policy for a repairable redundant machining system with controlled rates", *RAIRO-Operations Research*, vol. 50, no. 4-5, pp. 891–907, 2016.
- [72] M. Jain, "Availability prediction of imperfect fault coverage system with reboot and common cause failure", *International Journal of Operational Research*, vol. 17, no. 3, pp. 374–397, 2013.
- [73] M. Jain and R. Gupta, "Availability analysis of repairable redundant system with three types of failures subject to common cause failure", *International Journal of Mathematics in Operational Research*, vol. 6, no. 3, pp. 271–296, 2014.
- [74] M. Jain and R. Gupta, "Optimal replacement policy for a repairable system with multiple vacations and imperfect fault coverage", *Computers & Industrial Engineering*, vol. 66, no. 4, pp. 710–719, 2013.
- [75] M. Jain, S. Kaur, and P. Singh, "Supplementary variable technique (SVT) for non-Markovian single server queue with service interruption (QSI)", *Operational Research*, pp. 1–44, 2019.
- [76] M. Jain and R. K. Meena, "Fault tolerant system with imperfect coverage, reboot and server vacation", *Journal of Industrial Engineering International*, vol. 13, no. 2, pp. 171–180, 2017.
- [77] M. Jain, R. K. Meena, and P. Kumar, "Maintainability of redundant machining system with vacation, imperfect recovery and reboot delay", *Arabian Journal for Science and Engineering*, pp. 1–17, 2019.
- [78] M. Jain and Preeti, "Transient analysis of a machine repair system with standby, two modes of failure, discouragement and switching failure", *International Journal of Operational Research*, vol. 21, no. 3, pp. 365–390, 2014.
- [79] M. Jain, Rakhee, and S. Maheshwari, "N-policy for a machine repair system with spares and reneging", *Applied Mathematical Modelling*, vol. 28, no. 6, pp. 513–531, 2004.
- [80] M. Jain and S. Rani, "Transient analysis of hardware and software systems with warm standbys and switching failures", *International Journal of Mathematics in Operational Research*, vol. 6, no. 1, pp. 1–28, 2014.
- [81] M. Jain, G. C. Sharma, and C. Shekhar, "Processor-shared service systems with queue-dependent processors", *Computers & Operations Research*, vol. 32, no. 3, pp. 629–645, 2005.

- [82] M. Jain, C. Shekhar, and S. Shukla, "Markov model for switching failure of warm spares in machine repair system", *Journal of Reliability and Statistical Studies*, vol. 7, pp. 57–68, 2014.
- [83] M. Jain, C. Shekhar, and R. K. Meena, "Admission control policy of maintenance for unreliable server machining system with working vacation", *Arabian Journal for Science and Engineering*, vol. 42, no. 7, pp. 2993–3005, 2017.
- [84] M. Jain, C. Shekhar, and S. Shukla, "A time-shared machine repair problem with mixed spares under N-policy", *Journal of Industrial Engineering International*, vol. 12, no. 2, pp. 145–157, 2016.
- [85] M. Jain, C. Shekhar, and S. Shukla, "Queueing analysis of two unreliable servers machining system with switching and common cause failure", *International Journal of Mathematics in Operational Research*, vol. 5, no. 4, pp. 508–536, 2013.
- [86] N. K. Jaiswal and K. Thiruvengadam, "Simple machine interference with two types of failure", *Operations Research*, vol. 11, no. 4, pp. 624–636, 1963.
- [87] T. Jiang, L. Liu, and J. Li, "Analysis of the M/G/1 queue in multi-phase random environment with disasters", *Journal of Mathematical Analysis and Applications*, vol. 430, no. 2, pp. 857–873, 2015.
- [88] L. J. Jowers, J. J. Buckley, and K. D. Reilly, "Simulating continuous fuzzy systems", *Information Sciences*, vol. 177, no. 2, pp. 436–448, 2007.
- [89] K. K. Kamalja, "Reliability computing method for generalized k-out-of-n system", *Journal of Computational and Applied Mathematics*, vol. 323, pp. 111– 122, 2017.
- [90] C. Kao and S. P. Chen, "A stochastic quasi-Newton method for simulation response optimization", *European Journal of Operational Research*, vol. 173, no. 1, pp. 30–46, 2006.
- [91] C. Kao, C. C. Li, and S. P. Chen, "Parametric programming to the analysis of fuzzy queues", *Fuzzy sets and systems*, vol. 107, no. 1, pp. 93–100, 1999.
- [92] J. C. Ke, H. I. Huang, and C. H. Lin, "A redundant repairable system with imperfect coverage and fuzzy parameters", *Applied Mathematical Modelling*, vol. 32, no. 12, pp. 2839–2850, 2008.
- [93] J. C. Ke, Y. L. Hsu, T. H. Liu, and Z. G. Zhang, "Computational analysis of machine repair problem with unreliable multi-repairmen", *Computers & Operations Research*, vol. 40, no. 3, pp. 848–855, 2013.

- [94] J. C. Ke, H. I. Huang, and C. H. Lin, "Fuzzy analysis for steady-state availability: A mathematical programming approach", *Engineering Optimization*, vol. 38, no. 8, pp. 909–921, 2006.
- [95] J. C. Ke, S. L. Lee, and Y. L. Hsu, "On a repairable system with detection, imperfect coverage and reboot: Bayesian approach", *Simulation Modelling Practice and Theory*, vol. 16, no. 3, pp. 353–367, 2008.
- [96] J. C. Ke and T. H. Liu, "A repairable system with imperfect coverage and reboot", *Applied Mathematics and Computation*, vol. 246, pp. 148–158, 2014.
- [97] J. C. Ke, T. H. Liu, and C. H. Wu, "An optimum approach of profit analysis on the machine repair system with heterogeneous repairmen", *Applied Mathematics and Computation*, vol. 253, pp. 40–51, 2015.
- [98] J. C. Ke, T. H. Liu, and D. Y. Yang, "Machine repairing systems with standby switching failure", *Computers & Industrial Engineering*, vol. 99, pp. 223– 228, 2016.
- [99] J. C. Ke and K. H. Wang, "Vacation policies for machine repair problem with two type spares", *Applied Mathematical Modelling*, vol. 31, no. 5, pp. 880– 894, 2007.
- [100] J. C. Ke and C. H. Wu, "Multi-server machine repair model with standbys and synchronous multiple vacation", *Computers & Industrial Engineering*, vol. 62, no. 1, pp. 296–305, 2012.
- [101] J. Keilson and A. Kooharian, "On time dependent queueing processes", *The Annals of Mathematical Statistics*, vol. 31, no. 1, pp. 104–112, 1960.
- [102] W. M. Kempa and M. Kobielnik, "Transient solution for the queue-size distribution in a finite-buffer model with general independent input stream and single working vacation policy", *Applied Mathematical Modelling*, vol. 59, pp. 614–628, 2018.
- [103] L. Kleinrock, *Theory, Volume 1, Queueing Systems*. New York, NY, USA: Wiley-Interscience, 1975.
- [104] A. Kumar and M. Agarwal, "A review of standby redundant systems", *IEEE Transactions on Reliability*, vol. 29, no. 4, pp. 290–294, 1980.
- [105] B. K. Kumar and D. Arivudainambi, "Transient solution of an *M/M/1* queue with catastrophes", *Computers & Mathematics with applications*, vol. 40, no. 10-11, pp. 1233–1240, 2000.

- [106] B. K. Kumar, A. Krishnamoorthy, S. P. Madheswari, and S. S. Basha, "Transient analysis of a single server queue with catastrophes, failures and repairs", *Queueing systems*, vol. 56, no. 3-4, pp. 133–141, 2007.
- [107] B. K. Kumar, A. Vijayakumar, and S. Sophia, "Transient analysis for statedependent queues with catastrophes", *Stochastic Analysis and Applications*, vol. 26, no. 6, pp. 1201–1217, 2008.
- [108] K. Kumar, M. Jain, and C. Shekhar, "Machine repair system with *F*-policy, two unreliable servers, and warm standbys", *Journal of Testing and Evaluation*, vol. 47, no. 1, pp. 361–383, 2018.
- [109] R. Kumar, "A catastrophic-cum-restorative queueing system with correlated batch arrivals and general service time distribution", *Pakistan Journal of Statistics and Operation Research*, vol. 8, no. 1, pp. 43–53, 2012.
- [110] C. C. Kuo and J. C. Ke, "Modeling and comparison of the series systems with imperfect coverage for an unreliable server", *Soft Computing*, vol. 23, no. 6, pp. 2073–2082, 2019.
- [111] C. C. Kuo and J. C. Ke, "Comparative analysis of standby systems with unreliable server and switching failure", *Reliability Engineering & System Safety*, vol. 145, pp. 74–82, 2016.
- [112] M. Kurano, M. Yasuda, J. Nakagami, and Y. Yoshida, "A fuzzy approach to Markov decision processes with uncertain transition probabilities", *Fuzzy Sets and Systems*, vol. 157, no. 19, pp. 2674–2682, 2006.
- [113] R. L. Larsen and A. K. Agrawala, "Control of a heterogeneous two-server exponential queueing system", *IEEE Transactions on Software Engineering*, vol. SE-9, no. 4, pp. 522–526, 1983.
- [114] D. H. Lee and B. K. Kim, "A note on the sojourn time distribution of an M/G/1 queue with a single working vacation and vacation interruption", *Operations Research Perspectives*, vol. 2, pp. 57–61, 2015.
- [115] T. T. Lee, "M/G/1/N queue with vacation time and exhaustive service discipline", *Operations Research*, vol. 32, no. 4, pp. 774–784, 1984.
- [116] E. E. Lewis, *Introduction to reliability engineering*. Wiley New York, 1987.
- [117] J. H. Li, N. S. Tian, and Z. Y. Ma, "Performance analysis of *GI/M/1* queue with working vacations and vacation interruption", *Applied Mathematical Modelling*, vol. 32, no. 12, pp. 2715–2730, 2008.

- [118] J. Li and N. Tian, "The *M/G/1* queue with working vacations and vacation interruptions", *Journal of Systems Science and Systems Engineering*, vol. 16, no. 1, pp. 121–127, 2007.
- [119] K. Li, J. Wang, Y. Ren, and J. Chang, "Equilibrium joining strategies in M/M/1 queues with working vacation and vacation interruptions", *RAIRO-Operations Research*, vol. 50, no. 3, pp. 451–471, 2016.
- [120] R. J. Li and E. Lee, "Analysis of fuzzy queues", Computers & Mathematics with Applications, vol. 17, no. 7, pp. 1143–1147, 1989.
- [121] X. Li, J. Shi, X. Dong, and J. Yu, "A new conjugate gradient method based on quasi-Newton equation for unconstrained optimization", *Journal of Computational and Applied Mathematics*, vol. 350, pp. 372–379, 2019.
- [122] W. Lin and P. Kumar, "Optimal control of a queueing system with two heterogeneous servers", *IEEE Transactions on Automatic control*, vol. 29, no. 8, pp. 696–703, 1984.
- [123] X. Ling, Y. Wei, and S. Si, "Reliability optimization of k-out-of-n system with random selection of allocative components", *Reliability Engineering & System Safety*, vol. 186, pp. 186–193, 2019.
- [124] C. D. Liou, "Optimization analysis of the machine repair problem with multiple vacations and working breakdowns", *Journal of Industrial and Management Optimization*, vol. 11, no. 1, pp. 83–104, 2015.
- [125] B. Liu, L. Cui, Y. Wen, and J. Shen, "A cold standby repairable system with working vacations and vacation interruption following Markovian arrival process", *Reliability Engineering & System Safety*, vol. 142, pp. 1–8, 2015.
- [126] S. Lv, D. Yue, and J. Li, "Transient reliability of machine repairable system", *Journal of Information & Computational Science*, vol. 7, no. 13, pp. 2879– 2885, 2010.
- [127] M. Manglik and M. Ram, "Multistate multifailures system analysis with reworking strategy and imperfect fault coverage", in *Advances in System Reliability Engineering*, Elsevier, 2019, pp. 243–265.
- [128] D. Maritas and D. Xirokostas, "The M/E<sub>k</sub>/r machine interference model steady state equations and numerical solutions", *European Journal of Operational Research*, vol. 1, no. 2, pp. 112–123, 1977.
- [129] M. Mittler and C. Kern, "Discrete-time approximation of the machine interference problem with generally distributed failure, repair, and walking times", *European Journal of Control*, vol. 3, no. 4, pp. 254–267, 1997.

- [130] P. M. Morse, "Stochastic properties of waiting lines", Journal of the Operations Research Society of America, vol. 3, no. 3, pp. 255–261, 1955.
- [131] M. S. Moustafa, "Reliability analysis of K-out-of-N: G systems with dependent failures and imperfect coverage", *Reliability Engineering & System Safety*, vol. 58, no. 1, pp. 15–17, 1997.
- [132] P. Naor, "On machine interference", *Journal of the Royal Statistical Society: Series B (Methodological)*, vol. 18, no. 2, pp. 280–287, 1956.
- [133] D. Negi and E. Lee, "Analysis and simulation of fuzzy queues", *Fuzzy sets and systems*, vol. 46, no. 3, pp. 321–330, 1992.
- [134] H. Nguyen and E. Gouno, "Maximum likelihood and Bayesian inference for common-cause of failure model", *Reliability Engineering & System Safety*, vol. 182, pp. 56–62, 2019.
- [135] S. Osaki and T. Nakagawa, "A note on age replacement", *IEEE Transactions on Reliability*, vol. 24, no. 1, pp. 92–94, 1975.
- [136] H. Ozaki and A. Kara, "Reliability analysis of 1-for-2 shared protection systems with general repair-time distributions", *Applied Mathematical Modelling*, vol. 36, no. 1, pp. 333–347, 2012.
- [137] C. Palm, "Intensitätsschwankungen im fernsprechverkehr", *Ericsson Techniks*, vol. 44, pp. 1–189, 1943.
- [138] M. J. Pardo and D. de la Fuente, "A new technique to optimize the functions of fuzzy profit of queueing models: Application to a queueing model with publicity and renouncement", *Computers & Mathematics with Applications*, vol. 57, no. 5, pp. 850–864, 2009.
- [139] H. Pham, "Reliability analysis of a high voltage system with dependent failures and imperfect coverage", *Reliability Engineering & System Safety*, vol. 37, no. 1, pp. 25–28, 1992.
- [140] T. E. Phipps Jr, "Machine repair as a priority waiting-line problem", Operations Research, vol. 4, no. 1, pp. 76–85, 1956.
- [141] H. M. Prade, "An outline of fuzzy or possibilistic models for queuing systems", in *Fuzzy sets*, Springer, 1980, pp. 147–153.
- [142] S. Pradhan and U. C. Gupta, "Modeling and analysis of an infinite-buffer batch-arrival queue with batch-size-dependent service:  $M^X/G_n^{(a,b)}/1$ ", *Performance Evaluation*, vol. 108, pp. 16–31, 2017.

- [143] S. Qiu, Y. Hou, and H. X. Ming, "An implicit method for probabilistic commoncause failure analysis using Bayesian network", *IFAC-PapersOnLine*, vol. 51, no. 24, pp. 1037–1042, 2018.
- [144] P. Rajadurai, V. M. Chandrasekaran, and M. C. Saravanarajan, "Analysis of an unreliable retrial *G*-queue with working vacations and vacation interruption under Bernoulli schedule", *Ain Shams Engineering Journal*, vol. 9, no. 2, pp. 567–580, 2018.
- [145] P. Rajadurai, M. C. Saravanarajan, and V. M. Chandrasekaran, "A study on M/G/1 feedback retrial queue with subject to server breakdown and repair under multiple working vacation policy", *Alexandria Engineering Journal*, vol. 57, no. 2, pp. 947–962, 2018.
- [146] J. E. Ramirez Marquez and D. W. Coit, "Optimization of system reliability in the presence of common cause failures", *Reliability Engineering & System Safety*, vol. 92, no. 10, pp. 1421–1434, 2007.
- [147] T. V. S. Rao and U. C. Gupta, "Performance modelling of the *M/G/1* machine repairman problem with cold-, warm-and hot-standbys", *Computers & Industrial Engineering*, vol. 38, no. 2, pp. 251–267, 2000.
- [148] T. L. Saaty, *Elements of queueing theory: with applications*. McGraw-Hill New York, 1961.
- [149] M. Sadeghi and E. Roghanian, "Reliability analysis of a warm standby repairable system with two cases of imperfect switching mechanism", *Scientia Iranica Transaction E: Industrial Engineering*, vol. 24, no. 2, pp. 808–822, 2017.
- [150] A. Salmasnia, E. Ameri, A. Ghorbanian, and H. Mokhtari, "A multi-objective multi-state degraded system to optimize maintenance/repair costs and system availability", *Scientia Iranica Transaction E: Industrial Engineering*, vol. 24, no. 1, pp. 355–363, 2017.
- [151] S. S. Sanga and M. Jain, "FM/FM/1 double orbit retrial queue with customers' joining strategy: A parametric nonlinear programing approach", Applied Mathematics and Computation, vol. 362, p. 124 542, 2019.
- [152] L. D. Servi and S. G. Finn, "M/M/1 queues with working vacations (M/M/1/WV)", *Performance Evaluation*, vol. 50, no. 1, pp. 41–52, 2002.
- [153] C. Shekhar, M. Jain, A. A. Raina, and R. P. Mishra, "Sensitivity analysis of repairable redundant system with switching failure and geometric reneging", *Decision Science Letters*, vol. 6, no. 4, pp. 337–350, 2017.

- [154] C. Shekhar, M. Jain, and S. Bhatia, "Fuzzy analysis of machine repair problem with switching failure and reboot", *Journal of Reliability and Statistical Studies*, vol. 7, no. S, pp. 41–55, 2014.
- [155] C. Shekhar, M. Jain, A. A. Raina, and J. Iqbal, "Reliability prediction of fault tolerant machining system with reboot and recovery delay", *International Journal of System Assurance Engineering and Management*, vol. 9, no. 2, pp. 377–400, 2018.
- [156] C. Shekhar, M. Jain, and A. A. Raina, "Transient analysis of machining system with spare provisioning and geometric reneging", *International Journal of Mathematics in Operational Research*, vol. 11, no. 3, pp. 396–421, 2017.
- [157] C. Shekhar, M. Jain, A. A. Raina, and J. Iqbal, "Optimal (N,F) policy for queue-dependent and time-sharing machining redundant system", *International Journal of Quality & Reliability Management*, vol. 34, no. 6, pp. 798– 816, 2017.
- [158] C. Shekhar, A. Kumar, and S. Varshney, "Parametric non-linear programming for fuzzified queueing systems with catastrophe", Accepted, 2017.
- [159] C. Shekhar, A. A. Raina, A. Kumar, and J. Iqbal, "A survey on queues in machining system: Progress from 2010 to 2017", *Yugoslav Journal of Operations Research*, vol. 27, no. 4, pp. 391–413, 2017.
- [160] C. J. Singh, M. Jain, and B. Kumar, "Analysis of *M/G/1* queueing model with state dependent arrival and vacation", *Journal of Industrial Engineering International*, vol. 8, no. 1, pp. 2–8, 2012.
- [161] V. V. Singh, M. Ram, and D. K. Rawal, "Cost analysis of an engineering system involving subsystems in series configuration", *IEEE Transactions on Automation Science and Engineering*, vol. 10, no. 4, pp. 1124–1130, 2013.
- [162] B. D. Sivazlian and K. H. Wang, "Economic analysis of the *M*/*M*/*R* machine repair problem with warm standbys", *Microelectronics Reliability*, vol. 29, no. 1, pp. 25–35, 1989.
- [163] S. Sutar and U. V. Naik Nimbalkar, "A load share model for non-identical components of a k-out-of-m system", *Applied Mathematical Modelling*, vol. 72, pp. 486–498, 2019.
- [164] J. Sztrik, "Asymptotic analysis of the reliability of a complex renewable standby system with fast repair", *Theory of Probability & Its Applications*, vol. 37, no. 1, pp. 101–104, 1993.

- [165] J. Sztrik and B. Bunday, "Machine interference problem with a random environment", *European Journal of Operational Research*, vol. 65, no. 2, pp. 259– 269, 1993.
- [166] J. Taylor and R. R. P. Jackson, "An application of the birth and death process to the provision of spare machines", *Journal of the Operational Research Society*, vol. 5, no. 4, pp. 95–108, 1954.
- [167] K. S. Trivedi, *Probability & Statistics with Reliability, Queuing and Computer Science Applications*. John Wiley & Sons, 2001.
- [168] F. A. Van Der Duyn Schouten and P. Wartenhorst, "A two-machine repair model with variable repair rate", *Naval Research Logistics*, vol. 40, no. 4, pp. 495–523, 1993.
- [169] K. V. Vijayashree and B. Janani, "Transient analysis of an *M/M/1* queue with multiple exponential vacation and *N*-policy", *Pakistan Journal of Statistics and Operation Research*, vol. 11, no. 4, pp. 587–600, 2015.
- [170] K. H. Wang, "Profit analysis of the *M/M/R* machine repair problem with spares and server breakdowns", *Journal of the Operational Research Society*, vol. 45, no. 5, pp. 539–548, 1994.
- [171] K. H. Wang and B. D. Sivazlian, "Reliability of a system with warm standbys and repairmen", *Microelectronics Reliability*, vol. 29, no. 5, pp. 849–860, 1989.
- [172] K. H. Wang and B. D. Sivazlian, "Cost analysis of the *M/M/R* machine repair problem with spares operating under variable service rates", *Microelectronics Reliability*, vol. 32, no. 8, pp. 1171–1183, 1992.
- [173] K. H. Wang, "An approach to cost analysis of the machine repair problem with two types of spares and service rates", *Microelectronics Reliability*, vol. 35, no. 11, pp. 1433–1436, 1995.
- [174] K. H. Wang, "Profit analysis of the machine repair problem with cold standbys and two modes of failure", *Microelectronics Reliability*, vol. 34, no. 10, pp. 1635–1642, 1994.
- [175] K. H. Wang, "Cost analysis of the M/M/R machine-repair problem with mixed standby spares", *Microelectronics Reliability*, vol. 33, no. 9, pp. 1293–1301, 1993.
- [176] K. H. Wang, W. L. Chen, and D. Y. Yang, "Optimal management of the machine repair problem with working vacation: Newton's method", *Journal of Computational and Applied Mathematics*, vol. 233, no. 2, pp. 449–458, 2009.

- [177] K. H. Wang and Y. J. Chen, "Comparative analysis of availability between three systems with general repair times, reboot delay and switching failures", *Applied Mathematics and Computation*, vol. 215, no. 1, pp. 384–394, 2009.
- [178] K. H. Wang and L. W. Chiu, "Cost benefit analysis of availability systems with warm standby units and imperfect coverage", *Applied Mathematics and Computation*, vol. 172, no. 2, pp. 1239–1256, 2006.
- [179] K. H. Wang and J. C. Ke, "A recursive method to the optimal control of an M/G/1 queueing system with finite capacity and infinite capacity", *Applied Mathematical Modelling*, vol. 24, no. 12, pp. 899–914, 2000.
- [180] K. H. Wang and C. C. Kuo, "Cost and probabilistic analysis of series systems with mixed standby components", *Applied Mathematical Modelling*, vol. 24, no. 12, pp. 957–967, 2000.
- [181] K. H. Wang, J. H. Su, and D. Y. Yang, "Analysis and optimization of an M/G/1 machine repair problem with multiple imperfect coverage", *Applied Mathematics and Computation*, vol. 242, pp. 590–600, 2014.
- [182] K. H. Wang and K. Y. Tai, "A queueing system with queue-dependent servers and finite capacity", *Applied Mathematical Modelling*, vol. 24, no. 11, pp. 807– 814, 2000.
- [183] K. H. Wang and D. Y. Yang, "Controlling arrivals for a queueing system with an unreliable server: Newton-quasi method", *Applied Mathematics and Computation*, vol. 213, no. 1, pp. 92–101, 2009.
- [184] K. H. Wang, T. C. Yen, and Y. C. Fang, "Comparison of availability between two systems with warm standby units and different imperfect coverage", *Quality Technology & Quantitative Management*, vol. 9, no. 3, pp. 265– 282, 2012.
- [185] K. H. Wang, T. C. Yen, and J. J. Jian, "Reliability and sensitivity analysis of a repairable system with imperfect coverage under service pressure condition", *Journal of Manufacturing Systems*, vol. 32, no. 2, pp. 357–363, 2013.
- [186] C. H. Wu and J. C. Ke, "Computational algorithm and parameter optimization for a multi-server system with unreliable servers and impatient customers", *Journal of Computational and Applied Mathematics*, vol. 235, no. 3, pp. 547–562, 2010.
- [187] C. H. Wu, W. C. Lee, J. C. Ke, and T. H. Liu, "Optimization analysis of an unreliable multi-server queue with a controllable repair policy", *Computers* & *Operations Research*, vol. 49, pp. 83–96, 2014.

- [188] R. R. Yager, "A characterization of the extension principle", *Fuzzy sets and systems*, vol. 18, no. 3, pp. 205–217, 1986.
- [189] R. R. Yager, "A procedure for ordering fuzzy subsets of the unit interval", *Information sciences*, vol. 24, no. 2, pp. 143–161, 1981.
- [190] M. Yamashiro and Y. Yuasa, "Repair system where the repairmen change depending on the failed machines", *Microelectronics Reliability*, vol. 36, no. 2, pp. 231–234, 1996.
- [191] D. Y. Yang and Y. D. Chang, "Sensitivity analysis of the machine repair problem with general repeated attempts", *International Journal of Computer Mathematics*, vol. 95, no. 9, pp. 1761–1774, 2018.
- [192] D. Y. Yang and C. L. Tsao, "Reliability and availability analysis of standby systems with working vacations and retrial of failed components", *Reliability Engineering & System Safety*, vol. 182, pp. 46–55, 2019.
- [193] D. Y. Yang, K. H. Wang, and C. H. Wu, "Optimization and sensitivity analysis of controlling arrivals in the queueing system with single working vacation", *Journal of Computational and Applied Mathematics*, vol. 234, no. 2, pp. 545–556, 2010.
- [194] D. Y. Yang and C. H. Wu, "Cost-minimization analysis of a working vacation queue with N-policy and server breakdowns", *Computers & Industrial Engineering*, vol. 82, pp. 151–158, 2015.
- [195] D. Y. Yang and Y. Y. Wu, "Analysis of a finite-capacity system with working breakdowns and retention of impatient customers", *Journal of Manufacturing Systems*, vol. 44, pp. 207–216, 2017.
- [196] D. Y. Yang, Z. R. Wu, and C. S. Tsou, "Reliability analysis of a repairable system with geometric reneging and threshold-based recovery policy", *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, vol. 229, no. 11, pp. 2047–2062, 2015.
- [197] R. D. Yearout, P. Reddy, and D. L. Grosh, "Standby redundancy in reliabilitya review", *IEEE Transactions on Reliability*, vol. 35, no. 3, pp. 285–292, 1986.
- [198] T. C. Yen and K. H. Wang, "Cost benefit analysis of three systems with imperfect coverage and standby switching failures", *International Journal of Mathematics in Operational Research*, vol. 12, no. 2, pp. 253–272, 2018.
- [199] L. A. Zadeh, "Fuzzy sets", *Information and control*, vol. 8, no. 3, pp. 338– 353, 1965.

- [200] L. A. Zadeh, "Fuzzy sets as a basis for a theory of possibility", *Fuzzy sets and systems*, vol. 1, no. 1, pp. 3–28, 1978.
- [201] M. Zhang and Z. Hou, "Performance analysis of MAP/G/1 queue with working vacations and vacation interruption", Applied Mathematical Modelling, vol. 35, no. 4, pp. 1551–1560, 2011.
- [202] M. Zhang and Z. Hou, "Performance analysis of *M/G/1* queue with working vacations and vacation interruption", *Journal of Computational and Applied Mathematics*, vol. 234, no. 10, pp. 2977–2985, 2010.
- [203] R. Zhang and Y. A. Phillis, "Fuzzy assignment of customers for a parallel queueing system with two heterogeneous servers", *Journal of Intelligent & Fuzzy Systems*, vol. 11, no. 3,4, pp. 163–169, 2001.
- [204] T. Zhang, M. Xie, and M. Horigome, "Availability and reliability of k-outof-(M + N): G warm standby systems", *Reliability Engineering & System Safety*, vol. 91, no. 4, pp. 381–387, 2006.
- [205] X. Zhang and L. Guo, "A new kind of repairable system with repairman vacations", *Journal of Nonlinear Science and Applications*, vol. 8, pp. 324– 333, 2015.
- [206] Y. Zhang, "Optimal allocation of active redundancies in weighted k-out-of-n systems", *Statistics & Probability Letters*, vol. 135, pp. 110–117, 2018.
- [207] C. Zhong and H. Jin, "A novel optimal preventive maintenance policy for a cold standby system based on semi-markov theory", *European Journal of Operational Research*, vol. 232, no. 2, pp. 405–411, 2014.
- [208] H. J. Zimmermann, *Fuzzy set theory and its applications*. Springer Science & Business Media, 2011.