Bibliography

- I. Antonopoulos, V. Robu, B. Couraud, D. Kirli, S. Norbu, A. Kiprakis, D. Flynn, S. Elizondo-Gonzalez, and S. Wattam, "Artificial intelligence and machine learning approaches to energy demand-side response: A systematic review," *Renewable* and Sustainable Energy Reviews, 2020, vol. 130, p. 109899.
- [2] Y. Nesterov et al., Lectures on convex optimization. Springer, 2018, vol. 137.
- [3] Y. Liu, X. Ma, L. Shu, G. P. Hancke, and A. M. Abu-Mahfouz, "From industry 4.0 to agriculture 4.0: Current status, enabling technologies, and research challenges," *IEEE Transactions on Industrial Informatics*, 2020, vol. 17, no. 6, pp. 4322–4334.
- [4] I. Ahmed, G. Jeon, and F. Piccialli, "From artificial intelligence to explainable artificial intelligence in industry 4.0: a survey on what, how, and where," *IEEE Transactions on Industrial Informatics*, 2022, vol. 18, no. 8, pp. 5031–5042.
- [5] L. A. Maglaras, K.-H. Kim, H. Janicke, M. A. Ferrag, S. Rallis, P. Fragkou, A. Maglaras, and T. J. Cruz, "Cyber security of critical infrastructures," *Ict Express*, 2018, vol. 4, no. 1, pp. 42–45.
- [6] C. Abraham, D. Chatterjee, and R. R. Sims, "Muddling through cybersecurity: Insights from the us healthcare industry," *Business horizons*, 2019, vol. 62, no. 4, pp. 539–548.
- [7] Y. Zhai, Y.-S. Ong, and I. W. Tsang, "The emerging" big dimensionality"," *IEEE Computational Intelligence Magazine*, 2014, vol. 9, no. 3, pp. 14–26.
- [8] A. K. Shukla, P. Singh, and M. Vardhan, "Gene selection for cancer types classification using novel hybrid metaheuristics approach," *Swarm and Evolutionary Computation*, 2020, vol. 54, p. 100661.
- [9] M. R. Rahman, T. Islam, M. Shahjaman, M. R. Islam, S. D. Lombardo, P. Bramanti, R. Ciurleo, A. Bramanti, A. Tchorbanov, F. Fisicaro *et al.*, "Discovering

common pathogenetic processes between covid-19 and diabetes mellitus by differential gene expression pattern analysis," *Briefings in Bioinformatics*, 2021.

- [10] K. Tadist, S. Najah, N. S. Nikolov, F. Mrabti, and A. Zahi, "Feature selection methods and genomic big data: a systematic review," *Journal of Big Data*, 2019, vol. 6, no. 1, pp. 1–24.
- [11] P. Isola, J.-Y. Zhu, T. Zhou, and A. A. Efros, "Image-to-image translation with conditional adversarial networks," in *Proceedings of the IEEE conference on computer vision and pattern recognition*, 2017, pp. 1125–1134.
- [12] M. Arjovsky and L. Bottou, "Towards principled methods for training generative adversarial networks," arXiv preprint arXiv:1701.04862, 2017.
- [13] A. Telikani, A. Tahmassebi, W. Banzhaf, and A. H. Gandomi, "Evolutionary machine learning: A survey," ACM Computing Surveys (CSUR), 2021, vol. 54, no. 8, pp. 1–35.
- [14] J. Zhang, Z.-h. Zhan, Y. Lin, N. Chen, Y.-j. Gong, J.-h. Zhong, H. S. Chung, Y. Li, and Y.-h. Shi, "Evolutionary computation meets machine learning: A survey," *IEEE Computational Intelligence Magazine*, 2011, vol. 6, no. 4, pp. 68–75.
- [15] S. Boyd and L. Vandenberghe, Convex optimization. Cambridge university press, 2004.
- [16] A. A. Freitas, "A critical review of multi-objective optimization in data mining: a position paper," ACM SIGKDD Explorations Newsletter, 2004, vol. 6, no. 2, pp. 77–86.
- [17] S. Saha, S. Acharya, K. Kavya, and S. Miriyala, "Simultaneous clustering and feature weighting using multiobjective optimization for identifying functionally similar mirnas," *IEEE journal of biomedical and health informatics*, 2018, vol. 22, no. 5, pp. 1684–1690.
- [18] I. BoussaïD, J. Lepagnot, and P. Siarry, "A survey on optimization metaheuristics," *Information Sciences*, 2013, vol. 237, pp. 82–117.
- [19] A. Gogna and A. Tayal, "Metaheuristics: review and application," Journal of Experimental & Theoretical Artificial Intelligence, 2013, vol. 25, no. 4, pp. 503– 526.

- [20] W. Siedlecki and J. Sklansky, "A note on genetic algorithms for large-scale feature selection," *Pattern recognition letters*, 1989, vol. 10, no. 5, pp. 335–347.
- [21] I. Goodfellow, J. Pouget-Abadie, M. Mirza, B. Xu, D. Warde-Farley, S. Ozair, A. Courville, and Y. Bengio, "Generative adversarial networks," *Communications* of the ACM, 2020, vol. 63, no. 11, pp. 139–144.
- [22] W. Fedus, M. Rosca, B. Lakshminarayanan, A. M. Dai, S. Mohamed, and I. Good-fellow, "Many paths to equilibrium: Gans do not need to decrease a divergence at every step," arXiv preprint arXiv:1710.08446, 2017.
- [23] J. Li, J. Zhang, X. Gong, and S. Lü, "Evolutionary generative adversarial networks with crossover based knowledge distillation," in 2021 International Joint Conference on Neural Networks (IJCNN). IEEE, 2021, pp. 1–8.
- [24] Y. LeCun, Y. Bengio, and G. Hinton, "Deep learning," *nature*, 2015, vol. 521, no. 7553, pp. 436–444.
- [25] A. Lopez-Rincon, A. Tonda, M. Elati, O. Schwander, B. Piwowarski, and P. Gallinari, "Evolutionary optimization of convolutional neural networks for cancer mirna biomarkers classification," *Applied Soft Computing*, 2018, vol. 65, pp. 91– 100.
- [26] X.-W. Chen and X. Lin, "Big data deep learning: challenges and perspectives," *IEEE access*, 2014, vol. 2, pp. 514–525.
- [27] D. B. Fogel, "Evolutionary computation: Toward a new philosophy of machine intelligence," *IEEE Evolutionary Computation*, 1995, vol. 1080.
- [28] J. H. Holland, "Genetic algorithms and the optimal allocation of trials," SIAM Journal on Computing, 1973, vol. 2, no. 2, pp. 88–105.
- [29] S. Kirkpatrick, C. D. Gelatt, and M. P. Vecchi, "Optimization by simulated annealing," *science*, 1983, vol. 220, no. 4598, pp. 671–680.
- [30] R. Eberhart and J. Kennedy, "Particle swarm optimization, proceeding of ieee international conference on neural network," *Perth, Australia*, 1995, pp. 1942– 1948.
- [31] M. Hersovici, M. Jacovi, Y. S. Maarek, D. Pelleg, M. Shtalhaim, and S. Ur, "The shark-search algorithm. an application: tailored web site mapping," *Computer Networks and ISDN Systems*, 1998, vol. 30, no. 1-7, pp. 317–326.

- [32] K. Nara, T. Takeyama, and H. Kim, "A new evolutionary algorithm based on sheep flocks heredity model and its application to scheduling problem," in Systems, Man, and Cybernetics, 1999. IEEE SMC'99 Conference Proceedings. 1999 IEEE International Conference on, vol. 6. IEEE, 1999, pp. 503–508.
- [33] K. M. Passino, "Biomimicry of bacterial foraging for distributed optimization and control," *IEEE control systems*, 2002, vol. 22, no. 3, pp. 52–67.
- [34] X. Li, "A new intelligent optimization-artificial fish swarm algorithm," Doctor thesis, Zhejiang University of Zhejiang, China, 2003.
- [35] R. Martin and W. Stephen, "Termite: A swarm intelligent routing algorithm for mobilewireless ad-hoc networks," in *Stigmergic optimization*. Springer, 2006, pp. 155–184.
- [36] L. Bianchi and M. Dorigo, "Ant colony optimization and local search for the probabilistic traveling salesman problem: a case study in stochastic combinatorial optimization," 2006.
- [37] D. Karaboga and B. Basturk, "Artificial bee colony (abc) optimization algorithm for solving constrained optimization problems," in *International fuzzy systems* association world congress. Springer, 2007, pp. 789–798.
- [38] A. Mucherino and O. Seref, "Monkey search: a novel metaheuristic search for global optimization," in AIP conference proceedings, vol. 953, no. 1. AIP, 2007, pp. 162–173.
- [39] S. He, Q. H. Wu, and J. Saunders, "Group search optimizer: an optimization algorithm inspired by animal searching behavior," *IEEE transactions on evolutionary computation*, 2009, vol. 13, no. 5, pp. 973–990.
- [40] X.-S. Yang, "Firefly algorithms for multimodal optimization," in International symposium on stochastic algorithms. Springer, 2009, pp. 169–178.
- [41] X.-S. Yang and S. Deb, "Cuckoo search via lévy flights," in 2009 World Congress on Nature & Biologically Inspired Computing (NaBIC). IEEE, 2009, pp. 210–214.
- [42] X.-S. Yang, "A new metaheuristic bat-inspired algorithm," in Nature inspired cooperative strategies for optimization (NICSO 2010). Springer, 2010, pp. 65– 74.

- [43] W.-T. Pan, "A new fruit fly optimization algorithm: taking the financial distress model as an example," *Knowledge-Based Systems*, 2012, vol. 26, pp. 69–74.
- [44] A. H. Gandomi and A. H. Alavi, "Krill herd: a new bio-inspired optimization algorithm," *Communications in Nonlinear Science and Numerical Simulation*, 2012, vol. 17, no. 12, pp. 4831–4845.
- [45] A. Kaveh and N. Farhoudi, "A new optimization method: dolphin echolocation," Advances in Engineering Software, 2013, vol. 59, pp. 53–70.
- [46] E. Cuevas and M. Cienfuegos, "A new algorithm inspired in the behavior of the social-spider for constrained optimization," *Expert Systems with Applications*, 2014, vol. 41, no. 2, pp. 412–425.
- [47] S. A. Uymaz, G. Tezel, and E. Yel, "Artificial algae algorithm (aaa) for nonlinear global optimization," *Applied Soft Computing*, 2015, vol. 31, pp. 153–171.
- [48] S. Mirjalili, "The ant lion optimizer," Advances in Engineering Software, 2015, vol. 83, pp. 80–98.
- [49] —, "Dragonfly algorithm: a new meta-heuristic optimization technique for solving single-objective, discrete, and multi-objective problems," *Neural Computing* and Applications, 2016, vol. 27, no. 4, pp. 1053–1073.
- [50] O. Abedinia, N. Amjady, and A. Ghasemi, "A new metaheuristic algorithm based on shark smell optimization," *Complexity*, 2016, vol. 21, no. 5, pp. 97–116.
- [51] W. Yong, W. Tao, Z. Cheng-Zhi, and H. Hua-Juan, "A new stochastic optimization approach—dolphin swarm optimization algorithm," *International Journal of Computational Intelligence and Applications*, 2016, vol. 15, no. 02, p. 1650011.
- [52] M. D. Li, H. Zhao, X. W. Weng, and T. Han, "A novel nature-inspired algorithm for optimization: Virus colony search," *Advances in Engineering Software*, 2016, vol. 92, pp. 65–88.
- [53] S. Mirjalili and A. Lewis, "The whale optimization algorithm," Advances in engineering software, 2016, vol. 95, pp. 51–67.
- [54] S. Mirjalili, S. M. Mirjalili, and A. Hatamlou, "Multi-verse optimizer: a natureinspired algorithm for global optimization," *Neural Computing and Applications*, 2016, vol. 27, no. 2, pp. 495–513.

- [55] A. Askarzadeh, "A novel metaheuristic method for solving constrained engineering optimization problems: crow search algorithm," Computers & Structures, 2016, vol. 169, pp. 1–12.
- [56] S. Mirjalili, A. H. Gandomi, S. Z. Mirjalili, S. Saremi, H. Faris, and S. M. Mirjalili, "Salp swarm algorithm: A bio-inspired optimizer for engineering design problems," *Advances in Engineering Software*, 2017, vol. 114, pp. 163–191.
- [57] S. Saremi, S. Mirjalili, and A. Lewis, "Grasshopper optimisation algorithm: theory and application," *Advances in Engineering Software*, 2017, vol. 105, pp. 30–47.
- [58] F. Fausto, E. Cuevas, A. Valdivia, and A. González, "A global optimization algorithm inspired in the behavior of selfish herds," *Biosystems*, 2017, vol. 160, pp. 39–55.
- [59] G. Dhiman and V. Kumar, "Spotted hyena optimizer for solving complex and non-linear constrained engineering problems," in *Harmony Search and Nature Inspired Optimization Algorithms*. Springer, 2019, pp. 857–867.
- [60] X. Qi, Y. Zhu, and H. Zhang, "A new meta-heuristic butterfly-inspired algorithm," *Journal of Computational Science*, 2017, vol. 23, pp. 226–239.
- [61] E. Jahani and M. Chizari, "Tackling global optimization problems with a novel algorithm-mouth brooding fish algorithm," *Applied Soft Computing*, 2018, vol. 62, pp. 987–1002.
- [62] G. Kaur and S. Arora, "Chaotic whale optimization algorithm," Journal of Computational Design and Engineering, 2018.
- [63] S. Torabi and F. Safi-Esfahani, "Improved raven roosting optimization algorithm (irro)," Swarm and Evolutionary Computation, 2018, vol. 40, pp. 144–154.
- [64] M. Jain, V. Singh, and A. Rani, "A novel nature-inspired algorithm for optimization: Squirrel search algorithm," *Swarm and evolutionary computation*, 2019, vol. 44, pp. 148–175.
- [65] V. Bharti, B. Biswas, and K. K. Shukla, "A novel multiobjective gdwcn-pso algorithm and its application to medical data security," ACM Transactions on Internet Technology (TOIT), 2021, vol. 21, no. 2, pp. 1–28.

- [66] G. Dhiman, M. Garg, A. Nagar, V. Kumar, and M. Dehghani, "A novel algorithm for global optimization: rat swarm optimizer," *Journal of Ambient Intelligence* and Humanized Computing, 2021, vol. 12, no. 8, pp. 8457–8482.
- [67] A. Salehan and A. Deldari, "Corona virus optimization (cvo): A novel optimization algorithm inspired from the corona virus pandemic," *The Journal of Supercomputing*, 2021, pp. 1–32.
- [68] J. D. Schaffer, "Some experiments in machine learning using vector evaluated genetic algorithms (artificial intelligence, optimization, adaptation, pattern recognition)," 1984.
- [69] C. M. Fonseca, P. J. Fleming *et al.*, "Genetic algorithms for multiobjective optimization: Formulation and generalization." in *Icga*, vol. 93, no. July. Citeseer, 1993, pp. 416–423.
- [70] J. rey Horn, N. Nafpliotis, and D. E. Goldberg, "A niched pareto genetic algorithm for multiobjective optimization," in *Proceedings of the first IEEE conference on evolutionary computation, IEEE world congress on computational intelligence*, vol. 1. Citeseer, 1994, pp. 82–87.
- [71] N. Srinivas and K. Deb, "Muiltiobjective optimization using nondominated sorting in genetic algorithms," *Evolutionary computation*, 1994, vol. 2, no. 3, pp. 221–248.
- [72] E. Zitzler and L. Thiele, "Multiobjective evolutionary algorithms: a comparative case study and the strength pareto approach," *IEEE transactions on Evolutionary Computation*, 1999, vol. 3, no. 4, pp. 257–271.
- [73] E. Zitzler, M. Laumanns, and L. Thiele, "Spea2: Improving the strength pareto evolutionary algorithm," *TIK-report*, 2001, vol. 103.
- [74] K. Deb, A. Pratap, S. Agarwal *et al.*, "A fast and elitist multi-objective genetic algorithm: Nsga-ii. ieee transaction on evolutionary computation 2002; 6 (2): 182-197," *Biography: Zhong Xiaoping Born in*, 1977.
- [75] J. D. Knowles and D. W. Corne, "Approximating the nondominated front using the pareto archived evolution strategy," *Evolutionary computation*, 2000, vol. 8, no. 2, pp. 149–172.

- [76] D. W. Corne, J. D. Knowles, and M. J. Oates, "The pareto envelope-based selection algorithm for multiobjective optimization," in *International conference on parallel problem solving from nature*. Springer, 2000, pp. 839–848.
- [77] D. W. Corne, N. R. Jerram, J. D. Knowles, and M. J. Oates, "Pesa-ii: Regionbased selection in evolutionary multiobjective optimization," in *Proceedings of* the 3rd Annual Conference on Genetic and Evolutionary Computation. Morgan Kaufmann Publishers Inc., 2001, pp. 283–290.
- [78] M. Erickson, A. Mayer, and J. Horn, "The niched pareto genetic algorithm 2 applied to the design of groundwater remediation systems," in *International Confer*ence on Evolutionary Multi-Criterion Optimization. Springer, 2001, pp. 681–695.
- [79] T. Okabe, Y. Jin, B. Sendoff, and M. Olhofer, "Voronoi-based estimation of distribution algorithm for multi-objective optimization," in *Proceedings of the* 2004 Congress on Evolutionary Computation (IEEE Cat. No. 04TH8753), vol. 2. IEEE, 2004, pp. 1594–1601.
- [80] F. Xue, A. C. Sanderson, and R. J. Graves, "Pareto-based multi-objective differential evolution," in *Evolutionary Computation*, 2003. CEC'03. The 2003 Congress on, vol. 2. IEEE, 2003, pp. 862–869.
- [81] C. A. C. Coello, G. T. Pulido, and M. S. Lechuga, "Handling multiple objectives with particle swarm optimization," *IEEE Transactions on evolutionary computation*, 2004, vol. 8, no. 3, pp. 256–279.
- [82] M. Pelikan, K. Sastry, and D. E. Goldberg, "Multiobjective hboa, clustering, and scalability," in *Proceedings of the 7th annual conference on Genetic and evolutionary computation*. ACM, 2005, pp. 663–670.
- [83] C. A. C. Coello and N. C. Cortés, "Solving multiobjective optimization problems using an artificial immune system," *Genetic Programming and Evolvable Machines*, 2005, vol. 6, no. 2, pp. 163–190.
- [84] Q. Zhang and H. Li, "Moea/d: A multiobjective evolutionary algorithm based on decomposition," *IEEE Transactions on evolutionary computation*, 2007, vol. 11, no. 6, pp. 712–731.
- [85] Q. Zhang, A. Zhou, and Y. Jin, "Rm-meda: A regularity model-based multiobjective estimation of distribution algorithm," *IEEE Transactions on Evolutionary Computation*, 2008, vol. 12, no. 1, pp. 41–63.

- [86] M. Gong, L. Jiao, H. Du, and L. Bo, "Multiobjective immune algorithm with nondominated neighbor-based selection," *Evolutionary Computation*, 2008, vol. 16, no. 2, pp. 225–255.
- [87] V. L. Huang, S. Z. Zhao, R. Mallipeddi, and P. N. Suganthan, "Multi-objective optimization using self-adaptive differential evolution algorithm," in *Evolutionary Computation, 2009. CEC'09. IEEE Congress on.* IEEE, 2009, pp. 190–194.
- [88] B. Chen, W. Zeng, Y. Lin, and D. Zhang, "A new local search-based multiobjective optimization algorithm," *IEEE transactions on evolutionary computation*, 2014, vol. 19, no. 1, pp. 50–73.
- [89] H. Li, M. Gong, D. Meng, and Q. Miao, "Multi-objective self-paced learning." in AAAI, 2016, pp. 1802–1808.
- [90] F. Lin, J. Zeng, J. Xiahou, B. Wang, W. Zeng, and H. Lv, "Multiobjective evolutionary algorithm based on nondominated sorting and bidirectional local search for big data," *IEEE Transactions on Industrial Informatics*, 2017, vol. 13, no. 4, pp. 1979–1988.
- [91] Z. Liu, S. Guo, L. Wang, Y. Li, and X. Li, "A benefit conflict resolution approach for production planning energy optimization of group manufacturing," *IEEE Access*, 2019, vol. 7, pp. 45012–45031.
- [92] B. Nouri-Moghaddam, M. Ghazanfari, and M. Fathian, "A novel multi-objective forest optimization algorithm for wrapper feature selection," *Expert Systems with Applications*, 2021, vol. 175, p. 114737.
- [93] A. E. Eiben and J. Smith, "From evolutionary computation to the evolution of things," *Nature*, 2015, vol. 521, no. 7553, pp. 476–482.
- [94] E. Bonabeau, M. Dorigo, and G. Theraulaz, "Inspiration for optimization from social insect behaviour," *Nature*, 2000, vol. 406, no. 6791, pp. 39–42.
- [95] Z.-H. Zhan, L. Shi, K. C. Tan, and J. Zhang, "A survey on evolutionary computation for complex continuous optimization," *Artificial Intelligence Review*, 2022, vol. 55, no. 1, pp. 59–110.
- [96] R. García-Ródenas, L. J. Linares, and J. A. López-Gómez, "A memetic chaotic gravitational search algorithm for unconstrained global optimization problems," *Applied Soft Computing*, 2019, vol. 79, pp. 14–29.

- [97] H. Bouchekara, "Solution of the optimal power flow problem considering security constraints using an improved chaotic electromagnetic field optimization algorithm," *Neural Computing and Applications*, 2020, vol. 32, no. 7, pp. 2683–2703.
- [98] G. I. Sayed, A. Tharwat, and A. E. Hassanien, "Chaotic dragonfly algorithm: an improved metaheuristic algorithm for feature selection," *Applied Intelligence*, 2019, vol. 49, no. 1, pp. 188–205.
- [99] H. A. Abdulwahab, A. Noraziah, A. A. Alsewari, and S. Q. Salih, "An enhanced version of black hole algorithm via levy flight for optimization and data clustering problems," *IEEE Access*, 2019, vol. 7, pp. 142 085–142 096.
- [100] A. Baykasoğlu and M. E. Şenol, "Weighted superposition attraction algorithm for combinatorial optimization," *Expert Systems with Applications*, 2019, vol. 138, p. 112792.
- [101] R. Logesh, V. Subramaniyaswamy, V. Vijayakumar, X.-Z. Gao, and G.-G. Wang, "Hybrid bio-inspired user clustering for the generation of diversified recommendations," *Neural Computing and Applications*, 2020, vol. 32, no. 7, pp. 2487–2506.
- [102] C.-B. Cheng, H.-S. Shih, and E. S. Lee, "Metaheuristics for multi-level optimization," in *Fuzzy and Multi-Level Decision Making: Soft Computing Approaches*. Springer, 2019, pp. 171–188.
- [103] M. A. Tawhid and V. Savsani, "Multi-objective sine-cosine algorithm (mo-sca) for multi-objective engineering design problems," *Neural Computing and Applications*, 2019, vol. 31, no. 2, pp. 915–929.
- [104] W. Long, J. Jiao, X. Liang, S. Cai, and M. Xu, "A random opposition-based learning grey wolf optimizer," *IEEE Access*, 2019, vol. 7, pp. 113810–113825.
- [105] A. A. Heidari, S. Mirjalili, H. Faris, I. Aljarah, M. Mafarja, and H. Chen, "Harris hawks optimization: Algorithm and applications," *Future Generation Computer* Systems, 2019, vol. 97, pp. 849–872.
- [106] D. Tian, X. Zhao, and Z. Shi, "Chaotic particle swarm optimization with sigmoidbased acceleration coefficients for numerical function optimization," *Swarm and Evolutionary Computation*, 2019, vol. 51, p. 100573.
- [107] X.-S. Yang and X.-S. He, "Mathematical analysis of algorithms: part i," in Mathematical Foundations of Nature-Inspired Algorithms. Springer, 2019, pp. 59–73.

- [108] M. M. Mafarja and S. Mirjalili, "Hybrid binary ant lion optimizer with rough set and approximate entropy reducts for feature selection," *Soft Computing*, 2019, vol. 23, no. 15, pp. 6249–6265.
- [109] C. Huang, Y. Li, and X. Yao, "A survey of automatic parameter tuning methods for metaheuristics," *IEEE transactions on evolutionary computation*, 2019, vol. 24, no. 2, pp. 201–216.
- [110] M. Isiet and M. Gadala, "Self-adapting control parameters in particle swarm optimization," *Applied Soft Computing*, 2019, vol. 83, p. 105653.
- [111] R. Vafashoar and M. R. Meybodi, "Cellular learning automata based bare bones pso with maximum likelihood rotated mutations," *Swarm and evolutionary computation*, 2019, vol. 44, pp. 680–694.
- [112] Y. Wang, H. Liu, Z. Yu, and L. Tu, "An improved artificial neural network based on human-behaviour particle swarm optimization and cellular automata," *Expert* Systems with Applications, 2020, vol. 140, p. 112862.
- [113] P. Jiang, Q. Zhou, J. Liu, and Y. Cheng, "A three-stage surrogate model assisted multi-objective genetic algorithm for computationally expensive problems," in 2019 IEEE Congress on Evolutionary Computation (CEC). IEEE, 2019, pp. 1680–1687.
- [114] Y. Du, T. Wang, B. Xin, L. Wang, Y. Chen, and L. Xing, "A data-driven parallel scheduling approach for multiple agile earth observation satellites," *IEEE Transactions on Evolutionary Computation*, 2019, vol. 24, no. 4, pp. 679–693.
- [115] A. Santiago, B. Dorronsoro, A. J. Nebro, J. J. Durillo, O. Castillo, and H. J. Fraire, "A novel multi-objective evolutionary algorithm with fuzzy logic based adaptive selection of operators: Fame," *Information Sciences*, 2019, vol. 471, pp. 233–251.
- [116] C. Yue, B. Qu, K. Yu, J. Liang, and X. Li, "A novel scalable test problem suite for multimodal multiobjective optimization," *Swarm and Evolutionary Computation*, 2019, vol. 48, pp. 62–71.
- [117] G. E. Hinton, S. Osindero, and Y.-W. Teh, "A fast learning algorithm for deep belief nets," *Neural computation*, 2006, vol. 18, no. 7, pp. 1527–1554.

- [118] F. Rosenblatt, "The perceptron: a probabilistic model for information storage and organization in the brain." *Psychological review*, 1958, vol. 65, no. 6, p. 386.
- [119] M. Minsky and S. A. Papert, Perceptrons, Reissue of the 1988 Expanded Edition with a new foreword by Léon Bottou: An Introduction to Computational Geometry. MIT Press, 2017.
- [120] D. E. Rumelhart, G. E. Hinton, and R. J. Williams, "Learning representations by back-propagating errors," *nature*, 1986, vol. 323, no. 6088, pp. 533–536.
- [121] K. Hornik, M. Stinchcombe, and H. White, "Multilayer feedforward networks are universal approximators," *Neural networks*, 1989, vol. 2, no. 5, pp. 359–366.
- [122] Y. LeCun, B. Boser, J. S. Denker, D. Henderson, R. E. Howard, W. Hubbard, and L. D. Jackel, "Backpropagation applied to handwritten zip code recognition," *Neural computation*, 1989, vol. 1, no. 4, pp. 541–551.
- [123] G. E. Hinton *et al.*, "What kind of graphical model is the brain?" in *IJCAI*, vol. 5, 2005, pp. 1765–1775.
- [124] X. Glorot, A. Bordes, and Y. Bengio, "Deep sparse rectifier neural networks," in Proceedings of the fourteenth international conference on artificial intelligence and statistics. JMLR Workshop and Conference Proceedings, 2011, pp. 315–323.
- [125] K. O. Stanley and R. Miikkulainen, "Evolving neural networks through augmenting topologies," *Evolutionary computation*, 2002, vol. 10, no. 2, pp. 99–127.
- [126] C. Puliafito, E. Mingozzi, F. Longo, A. Puliafito, and O. Rana, "Fog computing for the internet of things: A survey," ACM Transactions on Internet Technology (TOIT), 2019, vol. 19, no. 2, pp. 1–41.
- [127] M. Elhoseny, K. Shankar, S. Lakshmanaprabu, A. Maseleno, and N. Arunkumar, "Hybrid optimization with cryptography encryption for medical image security in internet of things," *Neural computing and applications*, 2018, vol. -, pp. 1–15.
- [128] A. Darwish, A. E. Hassanien, M. Elhoseny, A. K. Sangaiah, and K. Muhammad, "The impact of the hybrid platform of internet of things and cloud computing on healthcare systems: opportunities, challenges, and open problems," *Journal* of Ambient Intelligence and Humanized Computing, 2019, vol. 10, no. 10, pp. 4151–4166.

- [129] K. Thomas, F. Li, A. Zand, J. Barrett, J. Ranieri, L. Invernizzi, Y. Markov, O. Comanescu, V. Eranti, A. Moscicki *et al.*, "Data breaches, phishing, or malware? understanding the risks of stolen credentials," in *Proceedings of the 2017 ACM SIGSAC conference on computer and communications security*, 2017, pp. 1421–1434.
- [130] C. M. Angst, E. S. Block, J. D'arcy, and K. Kelley, "When do it security investments matter? accounting for the influence of institutional factors in the context of healthcare data breaches," Accounting for the Influence of Institutional Factors in the Context of Healthcare Data Breaches (January 24, 2016). Angst, CM, Block, ES, D'Arcy, J., and Kelley, K, 2017, pp. 893–916.
- [131] A. Mullai and K. Mani, "Enhancing the security in rsa and elliptic curve cryptography based on addition chain using simplified swarm optimization and particle swarm optimization for mobile devices," *International Journal of Information Technology*, 2020, vol. -, pp. 1–14.
- [132] B. Lei, E.-L. Tan, S. Chen, D. Ni, T. Wang, and H. Lei, "Reversible watermarking scheme for medical image based on differential evolution," *Expert Systems with Applications*, 2014, vol. 41, no. 7, pp. 3178–3188.
- [133] V. Sharma and R. N. Mir, "An enhanced time efficient technique for image watermarking using ant colony optimization and light gradient boosting algorithm," *Journal of King Saud University-Computer and Information Sciences*, 2019, vol. -, p. in press.
- [134] W. Daniels, D. Hughes, M. Ammar, B. Crispo, N. Matthys, and W. Joosen, "S μ v-the security microvisor: a virtualisation-based security middleware for the internet of things," in *Proceedings of the 18th ACM/IFIP/USENIX Middleware Conference: Industrial Track.* Las Vegas, Nevada: ACM, 2017, pp. 36–42.
- [135] G. Manogaran, C. Thota, D. Lopez, and R. Sundarasekar, Big Data Security Intelligence for Healthcare Industry 4.0. Cham: Springer International Publishing, 2017, pp. 103–126.
- [136] S. P. Mohanty, V. P. Yanambaka, E. Kougianos, and D. Puthal, "Pufchain: A hardware-assisted blockchain for sustainable simultaneous device and data security in the internet of everything (ioe)," *IEEE Consumer Electronics Magazine*, 2020, vol. 9, no. 2, pp. 8–16.

- [137] T. Naheed, I. Usman, T. M. Khan, A. H. Dar, and M. F. Shafique, "Intelligent reversible watermarking technique in medical images using ga and pso," *Optik*, 2014, vol. 125, no. 11, pp. 2515–2525.
- [138] M. A. Alphonsa and N. MohanaSundaram, "A reformed grasshopper optimization with genetic principle for securing medical data," *Journal of Information Security* and Applications, 2019, vol. 47, pp. 410–420.
- [139] D. Coppersmith, "The data encryption standard (des) and its strength against attacks," *IBM journal of research and development*, 1994, vol. 38, no. 3, pp. 243– 250.
- [140] R. P. Adhie, Y. Hutama, A. S. Ahmar, M. Setiawan *et al.*, "Implementation cryptography data encryption standard (des) and triple data encryption standard (3des) method in communication system based near field communication (nfc)," in *Journal of Physics: Conference Series*, vol. 954. Makassar, Indonesia: IOP Publishing, 2018, pp. 1–8.
- [141] N. F. PUB, "197: Advanced encryption standard (aes)," Federal information processing standards publication, 2001, vol. 197, pp. 441–0311.
- [142] M. Khari, A. K. Garg, A. H. Gandomi, R. Gupta, R. Patan, and B. Balusamy, "Securing data in internet of things (iot) using cryptography and steganography techniques," *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, 2019, vol. 50, no. 1, pp. 73–80.
- [143] S. Pirbhulal, O. W. Samuel, W. Wu, A. K. Sangaiah, and G. Li, "A joint resourceaware and medical data security framework for wearable healthcare systems," *Future Generation Computer Systems*, 2019, vol. 95, pp. 382–391.
- [144] X. Chai, J. Zhang, Z. Gan, and Y. Zhang, "Medical image encryption algorithm based on latin square and memristive chaotic system," *Multimedia Tools and Applications*, 2019, vol. 78, no. 24, pp. 35419–35453.
- [145] J. Chen, L. Chen, L. Y. Zhang, and Z.-l. Zhu, "Medical image cipher using hierarchical diffusion and non-sequential encryption," *Nonlinear Dynamics*, 2019, vol. 96, no. 1, pp. 301–322.
- [146] Z. Hua, S. Yi, and Y. Zhou, "Medical image encryption using high-speed scrambling and pixel adaptive diffusion," *Signal Processing*, 2018, vol. 144, pp. 134–144.

- [147] S. Li, L. Zhao, and N. Yang, "Medical image encryption based on 2d zigzag confusion and dynamic diffusion," *Security and Communication Networks*, 2021, vol. 2021.
- [148] W. Song, C. Fu, Y. Zheng, L. Cao, and M. Tie, "A practical medical image cryptosystem with parallel acceleration," *Journal of Ambient Intelligence and Humanized Computing*, 2022, pp. 1–15.
- [149] M. Dash and H. Liu, "Feature selection for classification," Intelligent data analysis, 1997, vol. 1, no. 1-4, pp. 131–156.
- [150] Y. Liu, F. Tang, and Z. Zeng, "Feature selection based on dependency margin," *IEEE Transactions on Cybernetics*, 2014, vol. 45, no. 6, pp. 1209–1221.
- [151] J. Li, K. Cheng, S. Wang, F. Morstatter, R. P. Trevino, J. Tang, and H. Liu, "Feature selection: A data perspective," ACM Computing Surveys (CSUR), 2017, vol. 50, no. 6, pp. 1–45.
- [152] B. H. Nguyen, B. Xue, and M. Zhang, "A survey on swarm intelligence approaches to feature selection in data mining," *Swarm and Evolutionary Computation*, 2020, vol. 54, p. 100663.
- [153] W. Siedlecki and J. Sklansky, "A note on genetic algorithms for large-scale feature selection," in *Handbook of pattern recognition and computer vision*. World Scientific, 1993, pp. 88–107.
- [154] D. Gaikwad and R. C. Thool, "Intrusion detection system using bagging with partial decision treebase classifier," *Proceedia Computer Science*, 2015, vol. 49, pp. 92–98.
- [155] M. R. Kabir, A. R. Onik, and T. Samad, "A network intrusion detection framework based on bayesian network using wrapper approach," *International Journal* of Computer Applications, 2017, vol. 166, no. 4, pp. 13–17.
- [156] P. Tao, Z. Sun, and Z. Sun, "An improved intrusion detection algorithm based on ga and svm," *Ieee Access*, 2018, vol. 6, pp. 13624–13631.
- [157] M. Omidvar, A. Zahedi, and H. Bakhshi, "Eeg signal processing for epilepsy seizure detection using 5-level db4 discrete wavelet transform, ga-based feature selection and ann/svm classifiers," *Journal of Ambient Intelligence and Humanized Computing*, 2021, vol. 12, no. 11, pp. 10395–10403.

- [158] B. Xue, M. Zhang, and W. N. Browne, "Particle swarm optimisation for feature selection in classification: Novel initialisation and updating mechanisms," *Applied soft computing*, 2014, vol. 18, pp. 261–276.
- [159] B. Tran, B. Xue, and M. Zhang, "Variable-length particle swarm optimization for feature selection on high-dimensional classification," *IEEE Transactions on Evolutionary Computation*, 2018, vol. 23, no. 3, pp. 473–487.
- [160] J. Wu, L. Fang, J. Meng, M. Lin, and G. Dong, "Optimized multi-source fusion based state of health estimation for lithium-ion battery in fast charge applications," *IEEE Transactions on Energy Conversion*, 2021, vol. 37, no. 2, pp. 1489–1498.
- [161] A. Sharma, K. K. Paliwal, S. Imoto, and S. Miyano, "A feature selection method using improved regularized linear discriminant analysis," *Machine vision and applications*, 2014, vol. 25, no. 3, pp. 775–786.
- [162] K.-H. Chen, K.-J. Wang, K.-M. Wang, and M.-A. Angelia, "Applying particle swarm optimization-based decision tree classifier for cancer classification on gene expression data," *Applied Soft Computing*, 2014, vol. 24, pp. 773–780.
- [163] C. Garibay, G. Sanchez-Ante, L. E. Falcon-Morales, and H. Sossa, "Modified binary inertial particle swarm optimization for gene selection in dna microarray data," in *Mexican Conference on Pattern Recognition*. Springer, 2015, pp. 271– 281.
- [164] P. Mohapatra and S. Chakravarty, "Modified pso based feature selection for microarray data classification," in 2015 IEEE Power, Communication and Information Technology Conference (PCITC). IEEE, 2015, pp. 703–709.
- [165] P. Moradi and M. Gholampour, "A hybrid particle swarm optimization for feature subset selection by integrating a novel local search strategy," *Applied Soft Computing*, 2016, vol. 43, pp. 117–130.
- [166] M. S. R. Nalluri, T. SaiSujana, K. H. Reddy, and V. Swaminathan, "An efficient feature selection using artificial fish swarm optimization and svm classifier," in 2017 international conference on networks & advances in computational technologies (NetACT). IEEE, 2017, pp. 407–411.
- [167] P. Jinthanasatian, S. Auephanwiriyakul, and N. Theera-Umpon, "Microarray data classification using neuro-fuzzy classifier with firefly algorithm," in 2017

IEEE Symposium Series on Computational Intelligence (SSCI). IEEE, 2017, pp. 1–6.

- [168] Y. Arshak and A. Eesa, "A new dimensional reduction based on cuttlefish algorithm for human cancer gene expression," in 2018 International Conference on Advanced Science and Engineering (ICOASE). IEEE, 2018, pp. 48–53.
- [169] M. S. Pratiwi, A. Aditsania *et al.*, "Cancer detection based on microarray data classification using genetic bee colony (gbc) and conjugate gradient backpropagation with modified polak ribiere (mbp-cgp)," in 2018 International Conference on Computer, Control, Informatics and its Applications (IC3INA). IEEE, 2018, pp. 163–168.
- [170] I. Jain, V. K. Jain, and R. Jain, "An improved binary particle swarm optimization (ibpso) for gene selection and cancer classification using dna microarrays," in 2018 Conference on Information and Communication Technology (CICT). IEEE, 2018, pp. 1–6.
- [171] M. Allam and M. Nandhini, "Optimal feature selection using binary teaching learning based optimization algorithm," *Journal of King Saud University-Computer and Information Sciences*, 2018.
- [172] A. Zakeri and A. Hokmabadi, "Efficient feature selection method using real-valued grasshopper optimization algorithm," *Expert Systems with Applications*, 2019, vol. 119, pp. 61–72.
- [173] T. Ragunthar and S. Selvakumar, "A wrapper based feature selection in bone marrow plasma cell gene expression data," *Cluster Computing*, 2019, vol. 22, no. 6, pp. 13785–13796.
- [174] K. Chatra, V. Kuppili, D. R. Edla, and A. K. Verma, "Cancer data classification using binary bat optimization and extreme learning machine with a novel fitness function," *Medical & Biological Engineering & Computing*, 2019, vol. 57, no. 12, pp. 2673–2682.
- [175] N. Almugren and H. Alshamlan, "Ff-svm: new firefly-based gene selection algorithm for microarray cancer classification," in 2019 IEEE conference on computational intelligence in bioinformatics and computational biology (CIBCB). IEEE, 2019, pp. 1–6.

- [176] M. Ghosh, S. Begum, R. Sarkar, D. Chakraborty, and U. Maulik, "Recursive memetic algorithm for gene selection in microarray data," *Expert Systems with Applications*, 2019, vol. 116, pp. 172–185.
- [177] M. A. Tawhid and A. M. Ibrahim, "Feature selection based on rough set approach, wrapper approach, and binary whale optimization algorithm," *International jour*nal of machine learning and cybernetics, 2020, vol. 11, no. 3, pp. 573–602.
- [178] M. Alweshah, S. A. Khalaileh, B. B. Gupta, A. Almomani, A. I. Hammouri, and M. A. Al-Betar, "The monarch butterfly optimization algorithm for solving feature selection problems," *Neural Computing and Applications*, 2020, pp. 1–15.
- [179] E. Pashaei and E. Pashaei, "An efficient binary chimp optimization algorithm for feature selection in biomedical data classification," *Neural Computing and Applications*, 2022, vol. 34, no. 8, pp. 6427–6451.
- [180] C. Wang, C. Xu, X. Yao, and D. Tao, "Evolutionary generative adversarial networks," *IEEE Transactions on Evolutionary Computation*, 2019, vol. 23, no. 6, pp. 921–934.
- [181] V. Costa, N. Lourenço, and P. Machado, "Coevolution of generative adversarial networks," in *International Conference on the Applications of Evolutionary Computation (Part of EvoStar)*. Springer, 2019, pp. 473–487.
- [182] V. Costa, N. Lourenço, J. Correia, and P. Machado, "Coegan: evaluating the coevolution effect in generative adversarial networks," in *Proceedings of the Genetic* and Evolutionary Computation Conference, 2019, pp. 374–382.
- [183] F. Liu, H. Wang, J. Zhang, Z. Fu, A. Zhou, J. Qi, and Z. Li, "Evogan: An evolutionary computation assisted gan," *Neurocomputing*, 2022, vol. 469, pp. 81– 90.
- [184] N. Zaltron, L. Zurlo, and S. Risi, "Cg-gan: An interactive evolutionary gan-based approach for facial composite generation." in AAAI, 2020, pp. 2544–2551.
- [185] M. Baioletti, C. A. C. Coello, G. Di Bari, and V. Poggioni, "Multi-objective evolutionary gan," in *Proceedings of the 2020 Genetic and Evolutionary Computation Conference Companion*, 2020, pp. 1824–1831.
- [186] M. Baioletti, G. Di Bari, V. Poggioni, and C. A. C. Coello, "Smart multi-objective evolutionary gan," in 2021 IEEE Congress on Evolutionary Computation (CEC). IEEE, 2021, pp. 2218–2225.

- [187] Z. Iklima, A. Adriansyah, and S. Hitimana, "Self-collision avoidance of arm robot using generative adversarial network and particles swarm optimization (gan-pso)," *SINERGI*, 6 2021, vol. 25, no. 2.
- [188] J.-A. Rodríguez-de-la Cruz, H.-G. Acosta-Mesa, and E. Mezura-Montes, "Evolution of generative adversarial networks using pso for synthesis of covid-19 chest x-ray images," in 2021 IEEE Congress on Evolutionary Computation (CEC). IEEE, 2021, pp. 2226–2233.
- [189] S. J. Badashah, S. S. Basha, S. R. Ahamed, and S. Subba Rao, "Fractionalharris hawks optimization-based generative adversarial network for osteosarcoma detection using renyi entropy-hybrid fusion," *International Journal of Intelligent* Systems, 2021, vol. 36, no. 10, pp. 6007–6031.
- [190] L. Zhang and L. Zhao, "High-quality face image generation using particle swarm optimization-based generative adversarial networks," *Future Generation Computer Systems*, 2021, vol. 122, pp. 98–104.
- [191] J. Kennedy and R. Eberhart, "Particle swarm optimization," in Proceedings of ICNN'95-International Conference on Neural Networks, vol. 4. Perth, WA: IEEE, 1995, pp. 1942–1948.
- [192] M. Taherkhani and R. Safabakhsh, "A novel stability-based adaptive inertia weight for particle swarm optimization," *Applied Soft Computing*, 2016, vol. 38, pp. 281–295.
- [193] A. Ratnaweera, S. K. Halgamuge, and H. C. Watson, "Self-organizing hierarchical particle swarm optimizer with time-varying acceleration coefficients," *IEEE Transactions on evolutionary computation*, 2004, vol. 8, no. 3, pp. 240–255.
- [194] W. Liu, Z. Wang, Y. Yuan, N. Zeng, K. Hone, and X. Liu, "A novel sigmoidfunction-based adaptive weighted particle swarm optimizer," *IEEE transactions* on cybernetics, 2019, vol. Early Access, pp. 1–10.
- [195] A. Moaref and V. S. Naeini, "A particle swarm optimization based on a ring topology for fuzzy-rough feature selection," in *Fuzzy Systems (IFSC)*, 2013 13th Iranian Conference on. Qazvin, Iran: IEEE, 2013, pp. 1–6.
- [196] C. J. Bastos-Filho, M. P. Caraciolo, P. B. Miranda, and D. F. Carvalho, "Multiring particle swarm optimization," in *Neural Networks*, 2008. SBRN'08. 10th Brazilian Symposium on. Salvador, Bahia, Brazil: IEEE, 2008, pp. 111–116.

- [197] A. J. R. Medina, G. T. Pulido, and J. G. Ramírez-Torres, "A comparative study of neighborhood topologies for particle swarm optimizers," in *IJCCI*. Mexico: SciTePress, 2009, pp. 152–159.
- [198] M. Li, W. Du, and F. Nian, "An adaptive particle swarm optimization algorithm based on directed weighted complex network," *Mathematical problems in engineering*, 2014, vol. 2014, pp. 1–7.
- [199] F. Di Martino and S. Sessa, "Pso image thresholding on images compressed via fuzzy transforms," *Information Sciences*, 2020, vol. 506, pp. 308–324.
- [200] Y. Zhang, D.-w. Gong, X.-y. Sun, and Y.-n. Guo, "A pso-based multi-objective multi-label feature selection method in classification," *Scientific reports*, 2017, vol. 7, no. 1, pp. 1–12.
- [201] C. Puliafito, E. Mingozzi, F. Longo, A. Puliafito, and O. Rana, "Fog computing for the internet of things: A survey," ACM Transactions on Internet Technology (TOIT), 2019, vol. 19, no. 2, pp. 1–41.
- [202] M. Elhoseny, A. Abdelaziz, A. S. Salama, A. M. Riad, K. Muhammad, and A. K. Sangaiah, "A hybrid model of internet of things and cloud computing to manage big data in health services applications," *Future generation computer systems*, 2018, vol. 86, pp. 1383–1394.
- [203] L. A. Maglaras, K.-H. Kim, H. Janicke, M. A. Ferrag, S. Rallis, P. Fragkou, A. Maglaras, and T. J. Cruz, "Cyber security of critical infrastructures," *Ict Express*, 2018, vol. 4, no. 1, pp. 42–45.
- [204] S. Garg, K. Kaur, S. Batra, G. Kaddoum, N. Kumar, and A. Boukerche, "A multi-stage anomaly detection scheme for augmenting the security in iot-enabled applications," *Future Generation Computer Systems*, 2020, vol. 104, pp. 105–118.
- [205] J.-W. Kang, H.-J. Park, J.-S. Ro, and H.-K. Jung, "A strategy-selecting hybrid optimization algorithm to overcome the problems of the no free lunch theorem," *IEEE Transactions on Magnetics*, 2018, vol. 54, no. 3, pp. 1–4.
- [206] J. Kennedy, "Particle swarm optimization," in *Encyclopedia of machine learning*. New York: Springer, 2011, pp. 760–766.
- [207] Z. Jing, "Self-adaptive particle swarm optimization algorithm based on directedweighted complex networks," *Journal of Networks*, 2014, vol. 9, no. 8, pp. 2232– 2238.

- [208] X. Zhang, Y. Tian, R. Cheng, and Y. Jin, "An efficient approach to nondominated sorting for evolutionary multiobjective optimization," *IEEE Transactions* on Evolutionary Computation, 2014, vol. 19, no. 2, pp. 201–213.
- [209] W. J. Dixon, "Analysis of extreme values," The Annals of Mathematical Statistics, 1950, vol. 21, no. 4, pp. 488–506.
- [210] X. Meng, "Gap test," 2002. [Online]. Available: https://www.eg.bucknell.edu/ xmeng/Course/CS6337/Note/master/node46.html
- [211] X. Yao, Y. Liu, and G. Lin, "Evolutionary programming made faster," *IEEE Transactions on Evolutionary computation*, 1999, vol. 3, no. 2, pp. 82–102.
- [212] J. Derrac, S. García, D. Molina, and F. Herrera, "A practical tutorial on the use of nonparametric statistical tests as a methodology for comparing evolutionary and swarm intelligence algorithms," *Swarm and Evolutionary Computation*, 2011, vol. 1, no. 1, pp. 3–18.
- [213] E. Zitzler, K. Deb, and L. Thiele, "Comparison of multiobjective evolutionary algorithms: Empirical results," *Evolutionary computation*, 2000, vol. 8, no. 2, pp. 173–195.
- [214] K. Deb, Multi-objective optimization using evolutionary algorithms. Chichester, UK: John Wiley & Sons, 2001, vol. 16.
- [215] Z. Wang, A. C. Bovik, H. R. Sheikh, and E. P. Simoncelli, "Image quality assessment: from error visibility to structural similarity," *IEEE transactions on image* processing, 2004, vol. 13, no. 4, pp. 600–612.
- [216] R. Miotto, F. Wang, S. Wang, X. Jiang, and J. T. Dudley, "Deep learning for healthcare: review, opportunities and challenges," *Briefings in bioinformatics*, 2018, vol. 19, no. 6, pp. 1236–1246.
- [217] A. Mehrpooya, F. Saberi-Movahed, N. Azizizadeh, M. Rezaei-Ravari, M. Eftekhari, and I. Tavassoly, "High dimensionality reduction by matrix factorization for systems pharmacology," *bioRxiv*, 2021.
- [218] I. Guyon and A. Elisseeff, "An introduction to variable and feature selection," Journal of machine learning research, 2003, vol. 3, no. Mar, pp. 1157–1182.

- [219] R. Sheikhpour, M. A. Sarram, S. Gharaghani, and M. A. Z. Chahooki, "A survey on semi-supervised feature selection methods," *Pattern Recognition*, 2017, vol. 64, pp. 141–158.
- [220] W. Liu and J. Wang, "Recursive elimination current algorithms and a distributed computing scheme to accelerate wrapper feature selection," *Information Sciences*, 2022, vol. 589, pp. 636–654.
- [221] R. García-Ródenas, L. J. Linares, and J. A. López-Gómez, "A memetic chaotic gravitational search algorithm for unconstrained global optimization problems," *Applied Soft Computing*, 2019, vol. 79, pp. 14–29.
- [222] H. Muthusamy, S. Ravindran, S. Yaacob, and K. Polat, "An improved elephant herding optimization using sine-cosine mechanism and opposition based learning for global optimization problems," *Expert Systems with Applications*, 2021, vol. 172, p. 114607.
- [223] M. Xiong, X. Fang, and J. Zhao, "Biomarker identification by feature wrappers," *Genome Res.*, 2001, vol. 11, no. 11, pp. 1878–1887.
- [224] W. Li and Y. Yang, "How many genes are needed for a discriminant microarray data analysis," in *Methods of microarray data analysis*. Springer, 2002, pp. 137–149.
- [225] D. H. Wolpert and W. G. Macready, "No free lunch theorems for optimization," *IEEE transactions on evolutionary computation*, 1997, vol. 1, no. 1, pp. 67–82.
- [226] H. Saini, S. P. Lal, V. V. Naidu, V. W. Pickering, G. Singh, T. Tsunoda, and A. Sharma, "Gene masking-a technique to improve accuracy for cancer classification with high dimensionality in microarray data," *BMC medical genomics*, 2016, vol. 9, no. 3, pp. 261–269.
- [227] F. Al-Obeidat, A. Rocha, M. Akram, S. Razzaq, and F. Maqbool, "(cdrgi)-cancer detection through relevant genes identification," *Neural Computing and Applications*, 2021, pp. 1–8.
- [228] C. Qu, L. Zhang, J. Li, F. Deng, Y. Tang, X. Zeng, and X. Peng, "Improving feature selection performance for classification of gene expression data using harris hawks optimizer with variable neighborhood learning," *Briefings in Bioinformatics*, 2021.

- [229] H. Lu, J. Chen, K. Yan, Q. Jin, Y. Xue, and Z. Gao, "A hybrid feature selection algorithm for gene expression data classification," *Neurocomputing*, 2017, vol. 256, pp. 56–62.
- [230] P. Dayan and C. Watkins, "Q-learning," Machine learning, 1992, vol. 8, no. 3, pp. 279–292.
- [231] S. Padakandla, "A survey of reinforcement learning algorithms for dynamically varying environments," ACM Computing Surveys (CSUR), 2021, vol. 54, no. 6, pp. 1–25.
- [232] W. R. Gilks, S. Richardson, and D. Spiegelhalter, Markov chain Monte Carlo in practice. CRC press, 1995.
- [233] T. Hastie, "Tibshirani r. friedman j.: The elements of statistical learning," 2001.
- [234] "Home geo ncbi." [Online]. Available: https://www.ncbi.nlm.nih.gov/geo/
- [235] X. Zhang, Y. Xu, C. Yu, A. A. Heidari, S. Li, H. Chen, and C. Li, "Gaussian mutational chaotic fruit fly-built optimization and feature selection," *Expert Systems* with Applications, 2020, vol. 141, p. 112976.
- [236] T. Singh, "A chaotic sequence-guided harris hawks optimizer for data clustering," Neural Computing and Applications, 2020, vol. 32, pp. 17789–17803.
- [237] D. Yang, Z. Liu, and J. Zhou, "Chaos optimization algorithms based on chaotic maps with different probability distribution and search speed for global optimization," *Communications in Nonlinear Science and Numerical Simulation*, 2014, vol. 19, no. 4, pp. 1229–1246.
- [238] J. Feng, J. Zhang, X. Zhu, and W. Lian, "A novel chaos optimization algorithm," *Multimedia Tools and Applications*, 2017, vol. 76, no. 16, pp. 17405–17436.
- [239] R. P. Feynman, "Simulating physics with computers," in *Feynman and computa*tion. CRC Press, 2018, pp. 133–153.
- [240] P. W. Shor, "Algorithms for quantum computation: discrete logarithms and factoring," in *Proceedings 35th annual symposium on foundations of computer science.* Ieee, 1994, pp. 124–134.
- [241] L. K. Grover, "A fast quantum mechanical algorithm for database search," in Proceedings of the twenty-eighth annual ACM symposium on Theory of computing, 1996, pp. 212–219.

- [242] L. Spector, H. Barnum, H. J. Bernstein, and N. Swamy, "Finding a better-thanclassical quantum and/or algorithm using genetic programming," in *Proceedings* of the 1999 Congress on Evolutionary Computation-CEC99 (Cat. No. 99TH8406), vol. 3. IEEE, 1999, pp. 2239–2246.
- [243] A. Narayanan and M. Moore, "Quantum-inspired genetic algorithms," in Proceedings of IEEE international conference on evolutionary computation. IEEE, 1996, pp. 61–66.
- [244] K.-H. Han and J.-H. Kim, "Quantum-inspired evolutionary algorithm for a class of combinatorial optimization," *IEEE transactions on evolutionary computation*, 2002, vol. 6, no. 6, pp. 580–593.
- [245] S. Karmakar, A. Dey, and I. Saha, "Use of quantum-inspired metaheuristics during last two decades," in 2017 7th International Conference on Communication Systems and Network Technologies (CSNT). IEEE, 2017, pp. 272–278.
- [246] W. Deng, H. Liu, J. Xu, H. Zhao, and Y. Song, "An improved quantum-inspired differential evolution algorithm for deep belief network," *IEEE Transactions on Instrumentation and Measurement*, 2020, vol. 69, no. 10, pp. 7319–7327.
- [247] P. Benioff, "The computer as a physical system: A microscopic quantum mechanical hamiltonian model of computers as represented by turing machines," *Journal* of statistical physics, 1980, vol. 22, no. 5, pp. 563–591.
- [248] R. Jensi and G. W. Jiji, "An enhanced particle swarm optimization with levy flight for global optimization," *Applied Soft Computing*, 2016, vol. 43, pp. 248– 261.
- [249] S. Amirsadri, S. J. Mousavirad, and H. Ebrahimpour-Komleh, "A levy flightbased grey wolf optimizer combined with back-propagation algorithm for neural network training," *Neural Computing and Applications*, 2018, vol. 30, no. 12, pp. 3707–3720.
- [250] J. J. Liang, B. Y. Qu, and P. N. Suganthan, "Problem definitions and evaluation criteria for the cec 2014 special session and competition on single objective real-parameter numerical optimization," Computational Intelligence Laboratory, Zhengzhou University, Zhengzhou China and Technical Report, Nanyang Technological University, Singapore, 2013, vol. 635, p. 490.

- [251] M. Afshar and H. Usefi, "High-dimensional feature selection for genomic datasets," *Knowledge-Based Systems*, 2020, vol. 206, p. 106370.
- [252] N. V. Chawla, K. W. Bowyer, L. O. Hall, and W. P. Kegelmeyer, "Smote: synthetic minority over-sampling technique," *Journal of artificial intelligence research*, 2002, vol. 16, pp. 321–357.
- [253] K. Chen, B. Xue, M. Zhang, and F. Zhou, "Evolutionary multitasking for feature selection in high-dimensional classification via particle swarm optimisation," *IEEE Transactions on Evolutionary Computation*, 2021.
- [254] M. Mafarja and S. Mirjalili, "Whale optimization approaches for wrapper feature selection," *Applied Soft Computing*, 2018, vol. 62, pp. 441–453.
- [255] M. Abdel-Basset, D. El-Shahat, I. El-henawy, V. H. C. de Albuquerque, and S. Mirjalili, "A new fusion of grey wolf optimizer algorithm with a two-phase mutation for feature selection," *Expert Systems with Applications*, 2020, vol. 139, p. 112824.
- [256] B. Calvo and G. Santafé Rodrigo, "scmamp: Statistical comparison of multiple algorithms in multiple problems," *The R Journal*, 2016, vol. 8, no. 1, pp. 248–256.
- [257] I. Newton, "Bird migration," British Birds, 2010, vol. 103, pp. 413–416.
- [258] X.-S. Yang, Nature-inspired optimization algorithms. Elsevier, 2014.
- [259] X.-S. Yang, T. Ting, and M. Karamanoglu, "Random walks, lévy flights, markov chains and metaheuristic optimization," in *Future information communication* technology and applications. Springer, 2013, pp. 1055–1064.
- [260] S. Das, S. N. Mandal, and M. Shynal, "Pso-ga hybrid approach in image encryption," in Annual Convention of the Computer Society of India. Springer, 2018, pp. 692–701.
- [261] A. Anand and A. K. Singh, "Hybrid nature-inspired optimization and encryptionbased watermarking for e-healthcare," *IEEE Transactions on Computational Social Systems*, 2022.
- [262] K. Shankar, M. Elhoseny, R. S. Kumar, S. Lakshmanaprabu, and X. Yuan, "Secret image sharing scheme with encrypted shadow images using optimal homomorphic encryption technique," *Journal of Ambient Intelligence and Humanized Computing*, 2020, vol. 11, no. 5, pp. 1821–1833.

- [263] W. J. Dixon, "Analysis of extreme values," The Annals of Mathematical Statistics, 1950, vol. 21, no. 4, pp. 488–506.
- [264] B. Xue, M. Zhang, W. N. Browne, and X. Yao, "A survey on evolutionary computation approaches to feature selection," *IEEE Transactions on Evolutionary Computation*, 2015, vol. 20, no. 4, pp. 606–626.
- [265] S. Mirjalili, "Moth-flame optimization algorithm: A novel nature-inspired heuristic paradigm," *Knowledge-Based Systems*, 2015, vol. 89, pp. 228–249.
- [266] D. Demner-Fushman, S. Antani, M. Simpson, and G. R. Thoma, "Design and development of a multimodal biomedical information retrieval system," *Journal* of Computing Science and Engineering, 2012, vol. 6, no. 2, pp. 168–177. [Online]. Available: https://openi.nlm.nih.gov
- [267] E. Zitzler, K. Deb, and L. Thiele, "Comparison of multiobjective evolutionary algorithms: Empirical results," *Evolutionary computation*, 2000, vol. 8, no. 2, pp. 173–195.
- [268] K. Deb, L. Thiele, M. Laumanns, and E. Zitzler, "Scalable multi-objective optimization test problems," in *Proceedings of the 2002 Congress on Evolutionary Computation. CEC'02 (Cat. No. 02TH8600)*, vol. 1. IEEE, 2002, pp. 825–830.
- [269] S. Jiang, Y.-S. Ong, J. Zhang, and L. Feng, "Consistencies and contradictions of performance metrics in multiobjective optimization," *IEEE transactions on cybernetics*, 2014, vol. 44, no. 12, pp. 2391–2404.
- [270] K. Deb, A. Pratap, S. Agarwal, and T. Meyarivan, "A Fast and Elitist Multiobjective Genetic Algorithm: NSGA-II," *IEEE Transactions on Evolutionary Computation*, April 2002, vol. 6, no. 2, pp. 182–197.
- [271] M. R. Sierra and C. A. Coello Coello, "Improving pso-based multi-objective optimization using crowding, mutation and∈-dominance," in *International conference* on evolutionary multi-criterion optimization. Springer, 2005, pp. 505–519.
- [272] J.-Y. Zhu, T. Park, P. Isola, and A. A. Efros, "Unpaired image-to-image translation using cycle-consistent adversarial networks," in *Proceedings of the IEEE* international conference on computer vision, 2017, pp. 2223–2232.
- [273] P. L. Suárez, A. D. Sappa, and B. X. Vintimilla, "Infrared image colorization based on a triplet dcgan architecture," in *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops*, 2017, pp. 18–23.

- [274] Y. Zhang, S. Liu, C. Dong, X. Zhang, and Y. Yuan, "Multiple cycle-in-cycle generative adversarial networks for unsupervised image super-resolution," *IEEE transactions on Image Processing*, 2019, vol. 29, pp. 1101–1112.
- [275] Z. Murez, S. Kolouri, D. Kriegman, R. Ramamoorthi, and K. Kim, "Image to image translation for domain adaptation," in *Proceedings of the IEEE Conference* on Computer Vision and Pattern Recognition, 2018, pp. 4500–4509.
- [276] I. Goodfellow, J. Pouget-Abadie, M. Mirza, B. Xu, D. Warde-Farley, S. Ozair, A. Courville, and Y. Bengio, "Generative adversarial nets," vol. 27, 2014, pp. 2672–2680.
- [277] I. Gulrajani, F. Ahmed, M. Arjovsky, V. Dumoulin, and A. C. Courville, "Improved training of wasserstein gans," in Advances in neural information processing systems, 2017, pp. 5767–5777.
- [278] K. Deb, Multi-objective optimization using evolutionary algorithms. John Wiley & Sons, 2001, vol. 16.
- [279] Z. Xu, C. F. Moro, B. Bozóky, and Q. Zhang, "Gan-based virtual restaining: a promising solution for whole slide image analysis," arXiv preprint arXiv:1901.04059, 2019.
- [280] D. Yang, S. Hong, Y. Jang, T. Zhao, and H. Lee, "Diversity-sensitive conditional generative adversarial networks," arXiv preprint arXiv:1901.09024, 2019.
- [281] M. Heusel, H. Ramsauer, T. Unterthiner, B. Nessler, and S. Hochreiter, "Gans trained by a two time-scale update rule converge to a local nash equilibrium," in Advances in neural information processing systems, vol. 30, 2017, pp. 6626–6637.
- [282] T. Salimans, I. Goodfellow, W. Zaremba, V. Cheung, A. Radford, and X. Chen, "Improved techniques for training gans," *Advances in neural information process*ing systems, 2016, vol. 29, pp. 2234–2242.
- [283] K. Deb, A. Pratap, S. Agarwal, and T. Meyarivan, "A fast and elitist multiobjective genetic algorithm: Nsga-ii," *IEEE transactions on evolutionary computation*, 2002, vol. 6, no. 2, pp. 182–197.
- [284] A. Polino, R. Pascanu, and D. Alistarh, "Model compression via distillation and quantization," arXiv preprint arXiv:1802.05668, 2018.

- [285] "Introducing the model optimization toolkit for tensorflow." [Online]. Available: https://blog.tensorflow.org/2018/09/introducing-model-optimizationtoolkit.html
- [286] Z. Wang and A. C. Bovik, "A universal image quality index," *IEEE signal processing letters*, 2002, vol. 9, no. 3, pp. 81–84.
- [287] O. Al-Kadi, "Unpaired mr-ct brain dataset for unsupervised image translation," 2021. [Online]. Available: https://dx.doi.org/10.21227/c9yx-x936
- [288] "Anhir grand challenge." [Online]. Available: https://anhir.grandchallenge.org/Data/
- [289] F. Anglade, D. A. Milner Jr, and J. E. Brock, "Can pathology diagnostic services for cancer be stratified and serve global health?" *Cancer*, 2020, vol. 126, pp. 2431–2438.
- [290] B. H. Menze, A. Jakab, S. Bauer, J. Kalpathy-Cramer, K. Farahani, J. Kirby, Y. Burren, N. Porz, J. Slotboom, R. Wiest *et al.*, "The multimodal brain tumor image segmentation benchmark (brats)," *IEEE transactions on medical imaging*, 2014, vol. 34, no. 10, pp. 1993–2024.
- [291] K. McClymont and E. Keedwell, "Deductive sort and climbing sort: New methods for non-dominated sorting," *Evolutionary Computation*, 2012, vol. 20, no. 1, pp. 1–26.
- [292] P. C. Roy, M. M. Islam, and K. Deb, "Best order sort: A new algorithm to nondominated sorting for evolutionary multi-objective optimization," in *Proceedings* of the 2016 on Genetic and Evolutionary Computation Conference Companion, ser. GECCO '16 Companion. New York, NY, USA: Association for Computing Machinery, 2016, p. 1113–1120.
- [293] Y. Sato, M. Sato, and M. Miyakawa, "Distributed nsga-ii using the divide-andconquer method and migration for compensation on many-core processors," in 2017 21st Asia Pacific Symposium on Intelligent and Evolutionary Systems (IES). IEEE, 2017, pp. 83–88.
- [294] S. Mishra and C. A. C. Coello, "Parallel best order sort for non-dominated sorting: A theoretical study considering the pram-crew model," in 2019 IEEE Congress on Evolutionary Computation (CEC). IEEE, 2019, pp. 1022–1029.

- [295] H. Wang and X. Yao, "Corner Sort for Pareto-Based Many-Objective Optimization," *IEEE Transactions on Cybernetics*, January 2014, vol. 44, no. 1, pp. 92–102.
- [296] H. K. Singh, A. Isaacs, and T. Ray, "A pareto corner search evolutionary algorithm and dimensionality reduction in many-objective optimization problems," *IEEE Transactions on Evolutionary Computation*, 2011, vol. 15, no. 4, pp. 539– 556.

LIST OF PUBLICATIONS

Refereed Journal Papers

- Vandana Bharti, Bhaskar Biswas, Kaushal Kumar Shukla "A novel multiobjective gdwcn-pso algorithm and its application to medical data security", ACM Transactions on Internet Technology (TOIT), 21 (2021): 1-28. (SCI, Q1, IF: 3.989)
- 2. Vandana Bharti, Bhaskar Biswas, Kaushal Kumar Shukla "EMOCGAN: A novel evolutionary multiobjective cyclic generative adversarial network and its application to unpaired image translation", *Neural Computing and Applications*, (2021): 1-15. (SCI, Q1, IF: 5.102)
- 3. Vandana Bharti, Bhaskar Biswas, Kaushal Kumar Shukla "MDO: A Novel Murmuration-Flight based Dispersive Optimization Algorithm and its Application to Image Security", *Journal of Ambient Intelligence and Humanized Computing*, (2023): 1-15 (SCI, Q1, IF: 7.104)
- 4. Vandana Bharti, Bhaskar Biswas, Kaushal Kumar Shukla. "QEMCGAN: Quantized Evolutionary Gradient Aware Multiobjective Cyclic GAN for Medical Image Translation", *IEEE Journal of Biomedical and Health Informatics (JBHI)*, Under Review. (SCI, Q1, IF: 7.021)
- 5. Vandana Bharti, Bhaskar Biswas, Kaushal Kumar Shukla "QCSSA: A novel quantum-assisted chaotic squirrel search optimization for wrapper-based optimal feature selection in high-dimensional genomic data classification ", *Briefings in Bioinformatics*, Under Review. (SCI, Q1, IF: 13.994)
- [6.] Vandana Bharti, Bhaskar Biswas, Kaushal Kumar Shukla "MDOFS: A Novel Murmuration-Flight based Dispersive Optimization Algorithm for Feature Selection", *IEEE Transactions on Emerging Topics in Computing*, Under Review. (SCI, Q1, IF: 6.595)

Refereed Conference Papers

- 1. Vandana Bharti, Bhaskar Biswas, Kaushal Kumar Shukla. "QL-SSA: An Adaptive Q-Learning based Squirrel Search Algorithm for Feature Selection", *In 2022 IEEE Congress on Evolutionary Computation (CEC)* at IEEE World Congress on Computational Intelligence (WCCI'22), Padova, Italy, (2022): 1-7. (Top-tier International Conference).
- 2. Vandana Bharti, Bhaskar Biswas, Kaushal Kumar Shukla, et al. "Parallelization of Corner Sort with CUDA for Many-Objective Optimization," In The Genetic and Evolutionary Computation Conference (GECCO'22) at Boston, USA, (2022): 484-492. (Top-tier International Conference).
- 3. Vandana Bharti, Bhaskar Biswas, Kaushal Kumar Shukla. "Recent trends in nature inspired computation with applications to deep learning," In 10th IEEE International Conference on Cloud Computing, Data Science & Engineering (Confluence) at Noida, India, (2020): 294-299. (International Conference)

Refereed Book Chapters

- 1. Vandana Bharti, Bhaskar Biswas, Kaushal Kumar Shukla. "Computational intelligence in Internet of things for future healthcare applications," In IoT-Based Data Analytics for the Healthcare Industry. Elsevier Academic Press, (2021): 57-78. (Scopus Indexed)
- 2. Vandana Bharti, Bhaskar Biswas, Kaushal Kumar Shukla. "Swarm Intelligence for Deep Learning: Concepts, Challenges and Recent Trends," In Advances in Swarm Intelligence: Variations and Adaptations for Optimization Problems. Studies in Computational Intelligence, vol 1054. Springer, Cham (2023): 37-57. (Scopus Indexed)