A New Many-Objective Hybrid Method to Solve Scheduling Problems

K. Mihály[a], G. Kulcsár[a,*]

[a] *University of Miskolc, Department of Information Engineering, 3515 Miskolc-Egyetemváros, Hungary*

References

[1] S. H. Huang, J. H. Huang, H. C. Lee, and Y. Y. Tong, "A new hybrid algorithm for solving the vehicle routing problem with route balancing," Int. J. Ind. Eng. Manag., vol. 14, no. 1, pp. 51-62, March 2023, doi: 10.24867/IJIEM-2023-1-324.

[2] P. Renna, "Workload control order release with controllable processing time policies: an assessment by simulation," Int. J. Ind. Eng. Manag., vol. 13, no. 3, pp. 194-205, Sept. 2022, doi: 10.24867/IJIEM-2022-3-312.

[3] M. K. Adeyeri, S. P. Ayodeji, E. O. Olutomilola, and O. J. Abayomi, "The Automated Process Control Model for Energy Consumption Optimization within Plantain Flour Processing Facility," Int. J. Ind. Eng. Manag., vol. 13, no. 3, pp. 206-214, Sept. 2022, doi: 10.24867/IJIEM-2022-3-313.

[4] N. Fernandes, M. Thürer, F. Rodrigues, L. Pinto Ferreira, F. J. G. Silva, and P. Avila, "Worker Assignment in Dual Resource Constrained Systems Subject to Machine Failures: A Simulation Study," Int. J. Ind. Eng. Manag., vol. 13, no. 2, pp. 110-118, 30 June 2022, doi: 10.24867/IJIEM-2022-2-305.

[5] D. A. Kurniady, Nurochim, A. Komariah, Turwelis, H. T. Hoi, and V. H. Ca, "Construction project progress evaluation using a quantitative approach by considering time, cost and quality," Int. J. Ind. Eng. Manag., vol. 13, no. 1, pp. 49-57, March 2022, doi: 10.24867/IJIEM-2022-1-300.

[6] S. Gao, J. Daaboul, and J. Le Duigou, "Layout and scheduling optimization problem for a reconfigurable manufacturing system," Int. J. Ind. Eng. Manag., vol. 12, no. 3, pp. 174-186, Sept. 2021, doi: 10.24867/IJIEM-2021-3-286.

[7] T. Trisna, M. Marimin, Y. Arkeman, and T. C. Sunarti, "Fuzzy multi-objective optimization for wheat flour supply chain considering raw material substitution," Int. J. Ind. Eng. Manag., vol. 11, no. 3, pp. 182-191, Sept. 2020, doi: 10.24867/IJIEM-2020-3-263.

[8] S. K. Karimi, S. J. Sadjadi, and S. G. J. Naini, "A bi-objective production planning for a flexible supply chain solved using NSGA-II and MOPSO," Int. J. Ind. Eng. Manag., vol. 13, no. 1, pp. 18-37, March 2022, doi: 10.24867/IJIEM-2022-1-298.

[9] P. Chetthamrongchai, O. Stepanenko, N. Saenko, S. Bakhvalov, G. Aglyamova, and A. Iswanto, "A Developed Optimization Model for Mass Production Scheduling Considering the Role of Waste Materials," Int. J. Ind. Eng. Manag., vol. 13, no. 2, pp. 135-144, 30 June 2022, doi: 10.24867/IJIEM-2022-2-307.

[10] P. Brucker, A. Drexl, R. Möhring, K. Neumann, and E. Pesch, "Resource-constrained project scheduling: Notation, classification, models, and methods," European Journal of Operational Research, vol. 112, no. 1, pp. 3-41, Jan. 1999, doi: 10.1016/S0377-2217(98)00204-5.

[11] P. Brucker, "Scheduling and constraint propagation," Discrete Applied Mathematics, vol. 123, no. 1, pp. 227-256, Nov. 2002, doi: 10.1016/S0166-218X(01)00342-0.

[12] V. L. Tavares, "A review of the contribution of Operational Research to Project Management," European Journal of Operational Research, vol. 136, no. 1, pp. 1-18, 1 Jan. 2002, doi: 10.1016/S0377-2217(01)00097-2.

[13] C. Schwindt and J. Zimmermann, Handbook on Project Management and Scheduling, Vol.1, 1st ed., Switzerland, Cham: Springer International Publishing, 2015, doi: 10.1007/978-3-319-05443-8.

[14] C. Schwindt and J. Zimmermann, Handbook on Project Management and Scheduling Vol. 2, 1st ed., Switzerland, Cham: Springer International Publishing, 2015, doi: 10.1007/978-3-319-05915-0.

[15] A. A. B. Pritsker, W. J. Lawrence, and P. M. Wolfe, "Multiproject Scheduling with Limited Resources: A Zero-One Programming Approach," Management Science, vol. 16, no. 1, pp. 93-108, Sept. 1969.

[16] J. Blazewicz, J. K. Lenstra, and A. H. Kan, "Scheduling subject to resource constraints: classification and complexity," Discrete Applied Mathematics, vol. 5, no. 1, pp. 11-24, Jan. 1983, doi: 10.1016/0166-218X(83)90012-4.

[17] S. Hartmann and D. Briskorn, "A survey of variants and extensions of the resource-constrained project scheduling problem," European Journal of Operational Research, vol. 207, no. 1, pp. 1-14, 2010, doi: 10.1016/j.ejor.2009.11.005.

[18] S. Hartmann and D. Briskorn, "An updated survey of variants and extensions of the resource-constrained project scheduling problem," European Journal of Operational Research, vol. 297, no. 1, pp. 1-14, 2022, doi: 10.1016/j.ejor.2021.05.004.

[19] K. Taha, "Methods That Optimize Multi-Objective Problems: A Survey and Experimental Evaluation," IEEE Access, vol. 8, pp. 80855-80878, 2020, doi: 10.1109/ACCESS.2020.2989219.

[20] I. R. Meneghini, M. A. Alves, A. Gaspar-Cunha, and F. G. Guimarães, "Scalable and customizable benchmark problems for many-objective optimization," Applied Soft Computing, vol. 90, May 2020, doi: 10.48550/arXiv.2001.11591.

[21] A. Schnabel, C. Kellenbrink, and S. Helber, "Profit-oriented scheduling of resource-constrained projects with flexible capacity constraints," Business Research, vol. 11, no. 2, pp. 329-356, 2018, doi: 10.1007/s40685-018-0063-5.

[22] E. B. Tirkolaee, A. Goli, M. Hematian, A. K. Sangaiah, and T. Han, "Multi-objective multi-mode resource constrained project scheduling problem using Pareto-based algorithms," Computing, vol. 101, no. 6, pp. 547-570, 2019, doi: 10.1007/s00607-018-00693-1.

[23] B. H. Tabrizi, "Integrated planning of project scheduling and material procurement considering the environmental impacts," Computers & Industrial Engineering, vol. 120, pp. 103-115, June 2018, doi: 10.1016/j.cie.2018.04.031.

[24] S. Mane and M. R. Narasingarao, "A chaotic-based improved many-objective jaya algorithm for many-objective optimization problems," International Journal of Industrial Engineering Computations, vol. 12, no. 1, pp. 49-62, Oct. 2020, doi: 10.5267/j.ijiec.2020.10.001.

[25] R.-M. Chen, "Particle swarm optimization with justification and designed mechanisms for resource-constrained project scheduling problem," Expert Systems with Applications, vol. 38, no. 6, pp. 7102-7111, June 2011, doi: 10.1016/j.eswa.2010.12.059.

[26] H. Dai, W. Cheng and P. Guo, "An Improved Tabu Search for Multi-skill Resource-Constrained Project Scheduling Problems Under Step-Deterioration," Arabian Journal for Science and Engineering, vol. 43, no. 6, pp. 3279-3290, Jan. 2018, doi: 10.1007/s13369-017-3047-4.

[27] H. Saad, R. Chakrabortty, S. Elsayed and M. Ryan, "Quantum-Inspired Genetic Algorithm for Resource-Constrained Project-Scheduling," IEEE Access, vol. 9, pp. 38488-38502, 2021, doi: 10.1109/ACCESS.2021.3062790.

[28] H. F. Rahman, R. K. Chakrabortty, and M. J. Ryan, "Memetic algorithm for solving resource constrained project scheduling problems," Automation in Construction, vol. 111, March 2020, doi: 10.1016/j.autcon.2019.103052.

[29] K. M. Sallam, R. K. Chakrabortty, and M. J. Ryan, "A two-stage multi-operator differential evolution algorithm for solving Resource Constrained Project Scheduling problems," Future Generation Computer Systems, vol. 108, pp. 432-444, July 2020, doi: 10.1016/j.future.2020.02.074.

[30] R. V. Rao, "Jaya: A simple and new optimization algorithm for solving constrained and unconstrained optimization problems," International Journal of Industrial Engineering Computations, vol. 7, no. 1, pp. 19-34, 2016, doi: 10.5267/j.ijiec.2015.8.004.

[31] R. Pellerin, N. Perrier, and F. Berthaut, "A survey of hybrid metaheuristics for the resource-constrained project scheduling problem," European Journal of Operational Research, vol. 280, no. 2, pp. 395-416, 2020, doi: 10.1016/j.ejor.2019.01.063.

[32] R. Kolisch and S. Hartmann, "PSLIB Single Mode Scheduling Benchmark Dataset," 2006. [Online]. Available: http://www.om-db.wi.tum.de/psplib/getdata_sm.html. [Accessed 11-Oct-2023.].

[33] V. Valls, F. Ballestín, and S. Quintanilla, "A hybrid genetic algorithm for the resource-constrained project scheduling problem," European Journal of Operational Research, vol. 495-508, no. 2, pp. 495-508, 2008, doi: 10.1016/j.ejor.2006.12.033.

[34] J. C. Rivera, L. F. V. Moreno, F. J. S. Díaz, and G. E. Z. Peña, "A hybrid heuristic algorithm for solving the resource constrained project scheduling problem (RCPSP)," Revista EIA, vol. 10, no. 20, pp. 87-100, 2013, doi: 10.14508/reia.2013.10.20.87-100.

[35] F. Berthaut, R. Pellerin, A. Hajji, and N. Perrier, "A path relinking-based scatter search for the resource-constrained project scheduling problem," International Journal of Project Organisation and Management, vol. 10, no. 1, pp. 1-36, 2018, doi: 10.1504/IJPOM.2018.090372.