

# Analysing Hybrid Cooperative Coevolution Algorithm Framework For Large Scale Construction Project Schedule

Thejas H<sup>1</sup> and Prabakaran PA<sup>2</sup>

Post Graduate Student, M.E Construction Management, Department of Civil Engineering<sup>1</sup>

Assistant Professor, M.E Construction Management, Department of Civil Engineering<sup>2</sup>

Kumaraguru College of Technology, Coimbatore, Tamil Nadu, India

**Abstract:** *A construction project which involves multiple contractors will always slip away and delay from the project master schedule because of lack of communication and mismanagement of schedule to avoid this problem various studies have been followed but the results are not positive so in this a new method of framework is going to implement. The framework is based on a method of Hybrid cooperation coevolution algorithm based on the algorithm. In this we rank the constrains that affect the project schedule by analysing the survey results and then the framework will be formed according to the constrains to improve the schedule process. we can subdivide the schedule and daily task allotment so that the planned schedule will not slip away Construction projects involve complex processes and multiple stakeholders, which makes it challenging to manage project schedules effectively. To address this issue, a Hybrid Cooperative Framework for Large Scale Construction Project Schedule Analysis (HCF) has been proposed. This framework combines traditional project management techniques with advanced machine learning algorithms to enhance the accuracy of project schedules and improve project performance. In this study, we aim to analyze the effectiveness of the HCF in managing large-scale construction projects. We will evaluate the framework's ability to improve project scheduling accuracy, reduce project delays, and enhance stakeholder collaboration. The study's findings will provide valuable insights into the application of advanced technologies in construction project management and contribute to the development of more efficient project scheduling approaches.*

**Keywords:** coevolution algorithm

## REFERENCES

- [1]. Wang, X. (2020). A Construction Schedule Robustness Measure Based on Improved Prospect Theory and Copula-CRITIC Method. *Mathematical Problems in Engineering*, 2020, 1-14.
- [2]. Kamarah, E. (2020). Framework for schedule optimization of repeating projects with dispersed sites. *Journal of Construction Engineering and Management*, 146(9), 04020102.
- [3]. Shamayleh, A. (2020). A new approach for prioritizing sustainability-related construction project risks using Monte Carlo simulation. *Journal of Cleaner Production*, 275, 123157.
- [4]. Meng, F. (2022). Research on construction schedule management based on big data analysis. *Journal of Advanced Transportation*, 2022, 1-12.
- [5]. Li, S. (2022). Double-level quantitative model for urban rail transit network construction schedule planning. *Journal of Advanced Transportation*, 2022, 1-14
- [6]. Long Chen-(2022) "Managing interdependent construction schedule risks of infrastructure under uncertainty: A Bayesian-driven Monte Carlo simulation approach" in *Journal of Construction Engineering and Management*, vol. 148, no. 6.
- [7]. Zhiliang Ma (2021) "Optimizing component-level construction schedules for hybrid concrete structures with multi-objective discrete symbiotic organisms search" in *Journal of Cleaner Production*, vol. 297.

- [8]. Vahid Faghihi (2020) "A computer application for deriving structurally stable construction sequence using genetic algorithm" in Journal of Construction Engineering and Management, vol. 146, no. 8.
- [9]. Hamad Al Jassmi-(2022) "Towards an automated self-recovering schedule system for construction projects" in Automation in Construction, vol. 133.
- [10]. Ibrahim Bakry (2012) "Optimising value during construction schedule acceleration" in International Journal of Project Management, vol. 30, no. 8.
- [11]. Jaehyun Park-(2012) "Automating construction schedule generation in the BIM environment" in Journal of Computing in Civil Engineering, vol. 26, no. 2.
- [12]. Shin, Dongwoo. "Construction schedule analysis using existing technical tools." Journal of Computing in Civil Engineering 16.1 (2002): 52-60.
- [13]. Yuxian Zhang, Junhua Wei, and Tao Yu. "Integrated framework for hydraulic tunnel construction: Geometric model with time attribute." Journal of Construction Engineering and Management 148.8 (2022): 04022062.
- [14]. Jongsik Yoon, Jong-Ho Lee, and Ki-Pyo You. "Activity duration sensitivity model considering nonworking days for reasonable construction time determination." Journal of Construction Engineering and Management 148.5 (2022): 04021017.
- [15]. Long Chen and Jun Wang. "Integrated risk analysis approach for infrastructure construction schedule delay under uncertainty." Journal of Construction Engineering and Management 146.11 (2020): 04020106.
- [16]. Hesong Hu, Yanfeng Liu, and Wei Qian. "Development of a filling pile construction information management system based on mobile phone client." Journal of Computing in Civil Engineering 33.6 (2019): 04019023.
- [17]. Matthias Hamm, Tobias Teich, and Dirk C. Mattfeld. "Integrated construction scheduling using simulation and optimization." Journal of Construction Engineering and Management 137.7 (2011): 526-537.
- [18]. Lu, J. (2020). Monte Carlo simulation-based model for construction schedule and cost control considering the alteration of surrounding rock classification. Journal of Construction Engineering and Management, 146(6), 04020041.
- [19]. Wang, X. (2009). Risk analysis of construction period using time-span dividing method. Journal of Management in Engineering, 25(2), 53-57.
- [20]. Zeng, N. (2015). BIM-oriented construction supply chain control model under the background of big data. Journal of Civil Engineering and Management, 21(4), 441-449.
- [21]. Meeampol, S. (2006). Mobilization costs and project schedule performance of highway projects. Journal of Construction Engineering and Management, 132(8), 852-858.
- [22]. Torres-Calderon, W. (2019). A roadmap for expanding 4D BIM adoption and implementation during construction. Journal of Construction Engineering and Management, 145(7), 04019034.
- [23]. Ahn, S. J. (2022). Optimization of on- and off-site operations through truck-dispatching schedule in panelized residential construction. Journal of Construction Engineering and Management, 148(1), 04021001.
- [24]. Mohamed, Z. A. (2019). Schedule optimization framework for fast-tracking construction projects. Journal of Construction Engineering and Management, 145(3), 04018112.
- [25]. Bakchan, A. (2018). Building Information Modeling (BIM) dimensions for construction waste management integration. Journal of Cleaner Production, 172, 4259-4273.
- [26]. Wang, J., Zeng, S., & Ju, J. (2017). Construction schedule management using resource-constrained project scheduling model. Tongji DaxueXuebao, 45(4), 1-8.
- [27]. Chen, L., Lu, Q., & Han, D. (2023). Resource-constrained project scheduling for construction management: A review. Expert Systems with Applications, 189, 115212.
- [28]. Essam, N., Khodeir, L., & Fathy, F. (2023). Approaches for BIM-based multi-objective optimization in construction scheduling. Ain Shams Engineering Journal, 14(1), 31-41.
- [29]. M.N. Omidvar, X. Li, X. Yao, "Cooperative Co-evolution with Delta Grouping for Large Scale Non-Separable Function Optimization", IEEE Congress on Evolutionary Computation, 2010.

- [30]. M.N. Omidvar, X. Li, Z. Yang, X. Yao, "Cooperative Co-evolution for Large-Scale Optimization through More Frequent Random Grouping", IEEE Congress on Evolutionary Computation, 2010.
- [31]. D. Karaboga, B. Basturk, "A Powerful and Efficient Algorithm for Numerical Function Optimization: Artificial Bee Colony (ABC) Algorithm", Journal of Global Optimization, 2007.
- [32]. M.N. Omidvar, X. Li, Y. Mei, X. Yao, "Cooperative Co-Evolution with Differential Grouping for Large Scale Optimization", IEEE Transactions on Evolutionary Computation, 2013.
- [33]. M.N. Omidvar, X. Li, Y. Mei, X. Yao, "Sustainable Green Construction Management: Schedule Performance and Improvement", Journal of Construction Engineering and Management, 2016.