

Generative Design for Tower Crane Position Optimization

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ABSTRACT

Tower crane optimization is pivotal to ensure proper lifting and handling of materials, and warrant conflict-free work zones. This research, therefore, aims to optimize the position of a tower crane by maximizing its lift ability. To achieve the goals, Generative Design- a paradigm that integrates the constructive features of mathematical and visual optimization techniques, is used to develop a relatively comprehensible prototype. The first part of the research, thus, utilized Generative Design on two construction sites- and warranted a 40% improvement in the lift score. A pool of potential alternatives was explored and supplemented by the trade-off illustrations. On evaluating the usability aspects by interviewing 12 participants- it has been unanimously observed that the technique has extreme efficiency of usage and can evidently prevent the occurrence of errors. The study concludes by providing recommendations to augment the significance and usability of Generative Design for tower crane position optimization.