6 Conclusion

In this paper, we introduce the integrated mobile-robot and cloud-based defect inspection system for indoor built environments and discuss the practical challenges that the system addresses. We present a complete system with a mobile-robot platform powered by advanced navigation technology, defect inspection using novel 3D and AI analytic engines, intuitive user interface for robot-system control and data management. Our system has been tested in actual construction sites for robot navigation and indoor building quality analysis. The results demonstrate that our system outperforms manual inspection methods in terms of accuracy and speed. Moving forward, we plan to enhance the defect detection rates by incorporating more training data and leveraging manual defect entries as feedback for the learning process. Additionally, we aim to reduce inspection time significantly by conducting tests with multiple robots. The global construction robotics industry is experiencing steady growth, and we are actively exploring opportunities for commercialization in this rapidly expanding market.

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