

A Framework for Automated Daily Construction Progress Monitoring Leveraging Unordered Site Photographs

**Aritra Pal, S.M. ASCE,¹ Jacob J. Lin, A.M. ASCE,²
and Shang-Hsien Hsieh, M. ASCE³**

¹Ph.D. Candidate, Department of Civil Engineering, National Taiwan University (corresponding author). ORCID: <https://orcid.org/0000-0002-1644-7400>. Email: apal@caece.net

²Assistant Professor, Department of Civil Engineering, National Taiwan University. Email: jacoblin@ntu.edu.tw

³Professor, Department of Civil Engineering, National Taiwan University. Email: shhsieh@ntu.edu.tw

ABSTRACT

The exponential growth of on-site visual data and the advent of computer vision techniques have invigorated automated construction progress monitoring. However, the state-of-the-art automated progress monitoring methods are still insufficient for the daily monitoring of construction activities. As-built 3D point clouds at the construction site are captured on a specific time interval and require a considerable amount of processing time. Between the intervals, the daily site progress status is often not recorded. Additionally, existing methods report the progress status of any building element in binary form (i.e. completed or not completed) without reporting partial completion percentages. In the construction phase, although BIM models created can help progress monitoring, some schedule activities are usually not modeled in BIM. Automated progress monitoring of these activities is still challenging. To overcome these methodological challenges, this study proposes a novel framework for automated daily construction progress monitoring incorporating image localization and deep learning-based semantic segmentation. The preliminary results show that the framework can successfully detect daily progress with a partial completion percentage.