

# 2D-based Indoor Mobile Laser Scanning for Construction Mapping Application

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**Key words:** Geoinformation/GI; GNSS/GPS; Laser scanning; Low cost technology; Positioning; “Construction mapping”

## SUMMARY

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A common issue which occurs often in construction projects is how to determine the discrepancies between as-built or existing constructions and initial design. Physical manual measurement usually brings many of problems such as long measuring time, high labor consumption, and measurement error accumulation and in some cases lower accuracy. Therefore, more advanced technologies such as laser scanning and total station, which are used in geospatial mapping and surveying have been adopted in order to provide much more reliable and accurate measurements. However, technical and financial issues still constrain the widespread applications of well-known 3-dimensional (3D) terrestrial and aerial laser scanning, such as high equipment cost, complex pre-preparation, inconvenience of use and spatial limitation. This paper aims to introduce an innovative laser scanning method for indoor construction mapping. This method integrates an IMU-GPS positioning approach with a more convenient and lower costed 2-dimensional (2D) laser scanner to realize indoor 3D mapping for construction model creation. Although compared with traditional 3D laser scanning, its accuracy and reliability cannot reach such a high level currently, experimental results still indicate feasibility and potential capability of this indoor mobile laser scanning method. Furthermore, the cloud point acquired from this approach can be integrated with a Building Information Modelling (BIM) design in order to realize the construction applications such as quality

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control of as-built construction and indoor mapping of existing building. It is also expected that this method can be further improved to substitute the stationary 3D laser scanning for narrow and limited construction spatial mapping in the near future.

Keywords: 2D, 3D, Laser scanning, Indoor, Positioning, Mobile, Construction, Mapping

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