Integrating Indoor Positioning Techniques with Mobile Laser Scanner to Create Indoor Laser Scanning Models

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SUMMARY

As Built BIM models and other 3D rendering of existing buildings are becoming increasingly important for the construction industry as well as for improvement and implementation of smart and sensible cities. These models are extremely useful for things such as preconstruction planning, maintenance scheduling, urban planning and the recycling of building materials. Currently, various methods are used for creating As Built BIM and 3D models. The most widely used methods are laser scanning and photogrammetry. Laser scanning can either be used in static or kinematic (mobile) mode. The accuracy of the static laser scanning is high, compared to mobile scanning, but the costs associated can also be very high due to the time required and thus the large labour costs. Thus, mobile laser scanning could be more cost effective for some environments, where the accuracy requirements are lower. However current mobile techniques can also come at large expense, depending on the requirements of the model, an expensive system may not be necessary. This paper focuses on using a variety of indoor positioning techniques integrated with a relatively low-cost mobile laser scanner for the collection of mobile laser scanning data indoors. It aims to analyse whether the indoor positioning techniques are able to obtain the required accuracy and precision to create suitable BIM and 3D models. Several indoor positioning methods were used in an undecorated indoor environment for these tests. The accuracy of the models created using the integrated mobile mapping techniques have been compared with static 3D scans to assess the accuracy and precision of low cost mobile scan models.